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Building a World-Class Innovation and Digital Economy

Recommendations for an innovation and technology-led recovery

June 2020

Innovation

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A vision for a world-class UK innovation economy

A world-class innovation economy raises living standards, provides solutions to society's biggest challenges, and will drive a digital-first economic recovery

Technology and innovation are powerful engines of prosperity, inclusion and resilience that will drive radical benefits across society and support the UK's economic recovery - from large-scale carbon reduction to remote working technologies that transform how, and where, we work:

- **For people:** technology has been a lifeline to many during the Covid-19 outbreak. It has helped people to keep safe, work from home, connect with loved ones through video calls and stay on top of their finances through online banking. Going forward, the innovation economy offers considerable economic opportunities, from new job prospects and retraining to wage growth.
- **For business:** as Covid-19 has shown, adopting innovations like cloud computing or AI can transform business growth, customer engagement and impact. For example, innovation enables firms to streamline everyday processes, develop new business models and export globally from home.
- **For the UK:** innovation can supercharge regional growth and inclusion whilst driving solutions to society's biggest challenges – from reaching the UK's net zero targets and unlocking lifelong health to developing a vaccine for Covid-19.¹ A thriving innovation economy also enables the UK to lead international collaborations in areas from digital regulation to scientific research.

As the UK begins to build back better from Covid-19 and reshape its role internationally, a dynamic innovation economy is essential - to foster prosperity, create high-quality jobs, compete globally and attract investment

Covid-19 has driven a colossal demand for technology, connectivity and innovation amongst businesses and consumers. The crisis has highlighted the best of British innovation and business dynamism, but for the positive impacts to be sustainable and ingrained there are challenges to address. Many firms are struggling with lower cash reserves to invest in innovation, there is skyrocketing pressure on digital connectivity networks to power new technologies, and a growing concern about the impact of future regulation on the UK's digital dynamism. Against this backdrop, the UK is navigating a changing place in the world, embarking on new trade deals and reshaping its regulatory environment.

The UK is starting from a position of strength. The UK is globally renowned and respected for its thriving technology sector, pioneering science and innovation, and rule of law. The digital economy, a critical enabler of the UK's world-leading services sector, contributed £149 billion to the UK economy in 2018² and the UK's technology businesses raised £4.2 billion from January to May 2020.³ Technology and innovation are also powering growth and high value jobs across the country, with a quarter of Europe's top 20 cities for largest technology investment now found in the UK.⁴

The crisis has shown how much can be achieved in a short period with a strong partnership between government and industry and clear goals. This spirit of collaboration must be capitalised on in the months ahead, to unleash the benefits of innovation and build back better. The government's majority provides the potential for major investments, policy decisions and long-term strategies to support the innovation economy. Government must now take a strategic, ambitious and expeditious approach, in lockstep with business, to revitalise the innovation economy and unlock its benefits. Government must address the issues that tie firms' hands and prevent them from delivering for the UK economy, from planning law to fragmented regulation.

The UK now needs an ambitious vision to harness innovation and technology to support a jobs-rich economic recovery. Firms across the UK have outlined five 'signs of success' that will strengthen the UK's position

Innovation must be at the heart of the UK's future. This report sets out a vision for the UK's innovation economy, identifying why the innovation economy matters, how the UK compares internationally across a range of measures, and recommendations for government on how to build back better from Covid-19 and make the UK the world's leading innovation and digital economy. This is the first in a series of CBI reports on how the UK can build back better from Covid-19.

The report is split into five chapters and each section has a distinctive 'sign of success' that government and business can work towards over this Parliament to build back better. Together, these form a vision for a dynamic innovation economy, as Exhibit 1 shows. An evidence-based, international approach is vital and so we have identified an overall G7 metric for each 'sign of success' to set a target and enable comparison across economy-wide issues. To add breadth and support government policymaking, each chapter includes a wider range of domestic and international metrics that align to government and business priorities. The report analysis and business engagement were completed in January and February 2020, before the UK outbreak of Covid-19.



Exhibit 1 The Five Signs of Success






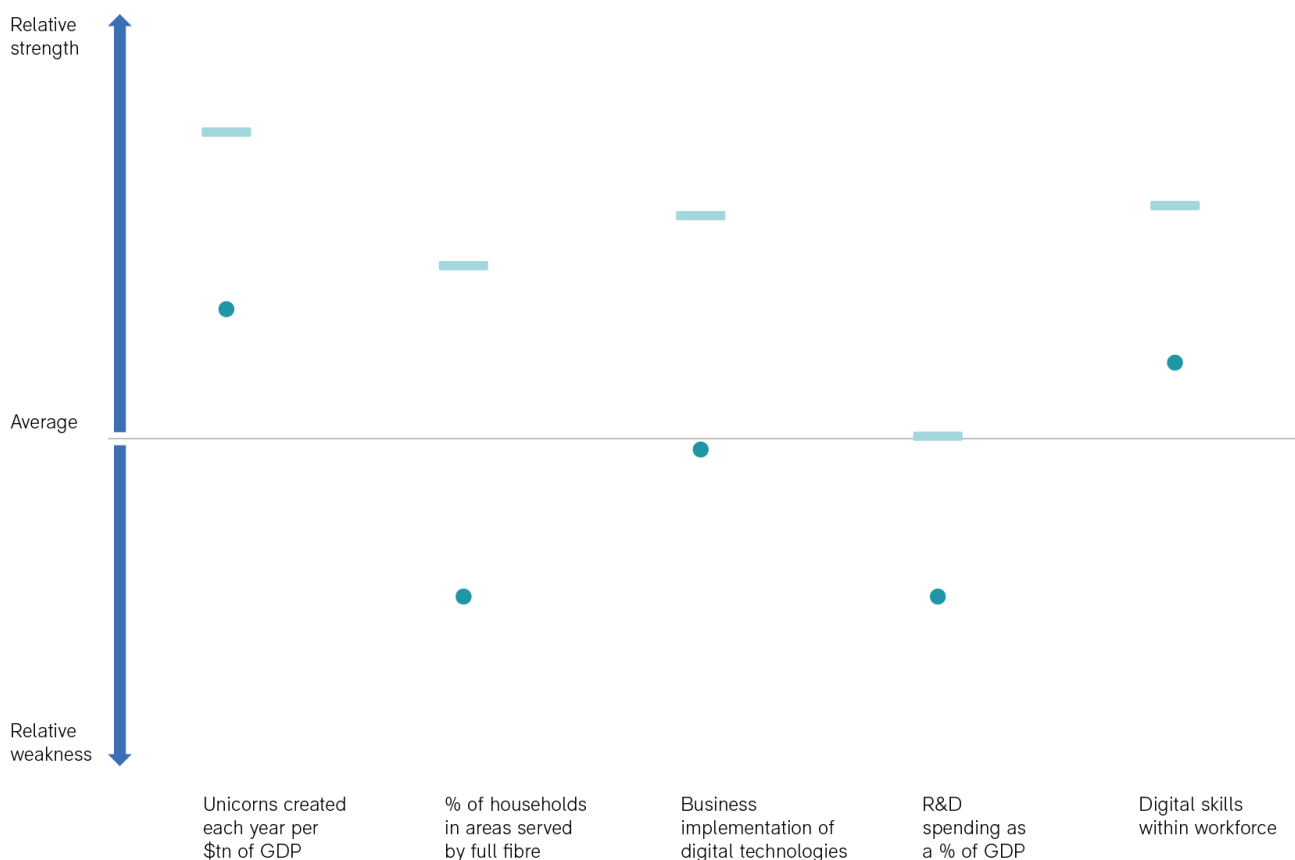
	Sign of Success	G7 indicator	Ranking today	Vision position for 2025
	Deliver Dynamism: The UK as a global leader for creating and scaling companies, backed by pro-innovation regulation	No. unicorns created in past 12 months per \$ trillion of GDP	2nd	1st
	Go for Gigabit: A gigabit-capable digital infrastructure network that supports a resilient, productive economy in every region	% premises with access to full fibre broadband ⁵	5th	2nd
	Accelerate Adoption: British business at the front of the pack globally for innovation adoption	Business implementation of digital technologies ⁶	2nd	1st
	Increase Innovation: The UK as a science and technology leader, harnessing R&D investment to deliver a stronger recovery, tackling major societal challenges	R&D spending as % of GDP	5th	4th
	Upskill on Digital: A flexible digital skills system that prepares people for jobs in technology and innovation, and attracts companies to innovate in the UK	Business view of level of sufficient digital skills in workforce ⁷	4th	2nd

Exhibit 2: UK's actual and targeted performance on 'signs of success' metrics relative to G7^{8,9}



■ Vision for 2025 ● UK now



Summary of recommendations

The following recommendations are a summary of the key themes in the report. These recommendations set out how government can create the right environment for innovation and work in partnership with business to make the UK the world's leading innovation economy. Detailed recommendations are outlined within the chapters.

1. Deliver Dynamism: Take a strategic approach to digital regulation and invest in the institutions needed to deliver it

- Develop a world-leading Digital Regulation Strategy to give companies the long-term certainty needed to invest in the UK, stimulate innovation and unlock new job opportunities
- Regulators with major digital portfolios should coordinate regulatory activity and create a comprehensive toolkit to boost business innovation
- Support dynamic start-ups and scale-ups by tackling barriers to entry through data sharing and finance

2. Go for Gigabit: Match political pledges with accelerated action on digital infrastructure

- Embark on a 12-month policy drive to reduce the time and cost of gigabit network rollout: speed up procurement for the £5 billion 'Outside In' investment, build investor confidence through Ofcom's regulatory reform, and tackle on-the-ground challenges such as exclusivity agreements and planning
- Form a connectivity taskforce to spur uptake of gigabit-capable digital connectivity across businesses and consumers
- Update the UK's 5G strategy to accelerate public sector and business adoption - making the UK a global ambassador for 5G industrial applications - and work with business to unlock 4G mobile coverage in all regions

3. Accelerate Adoption: Join-up, scale-up and simplify support to drive innovation adoption

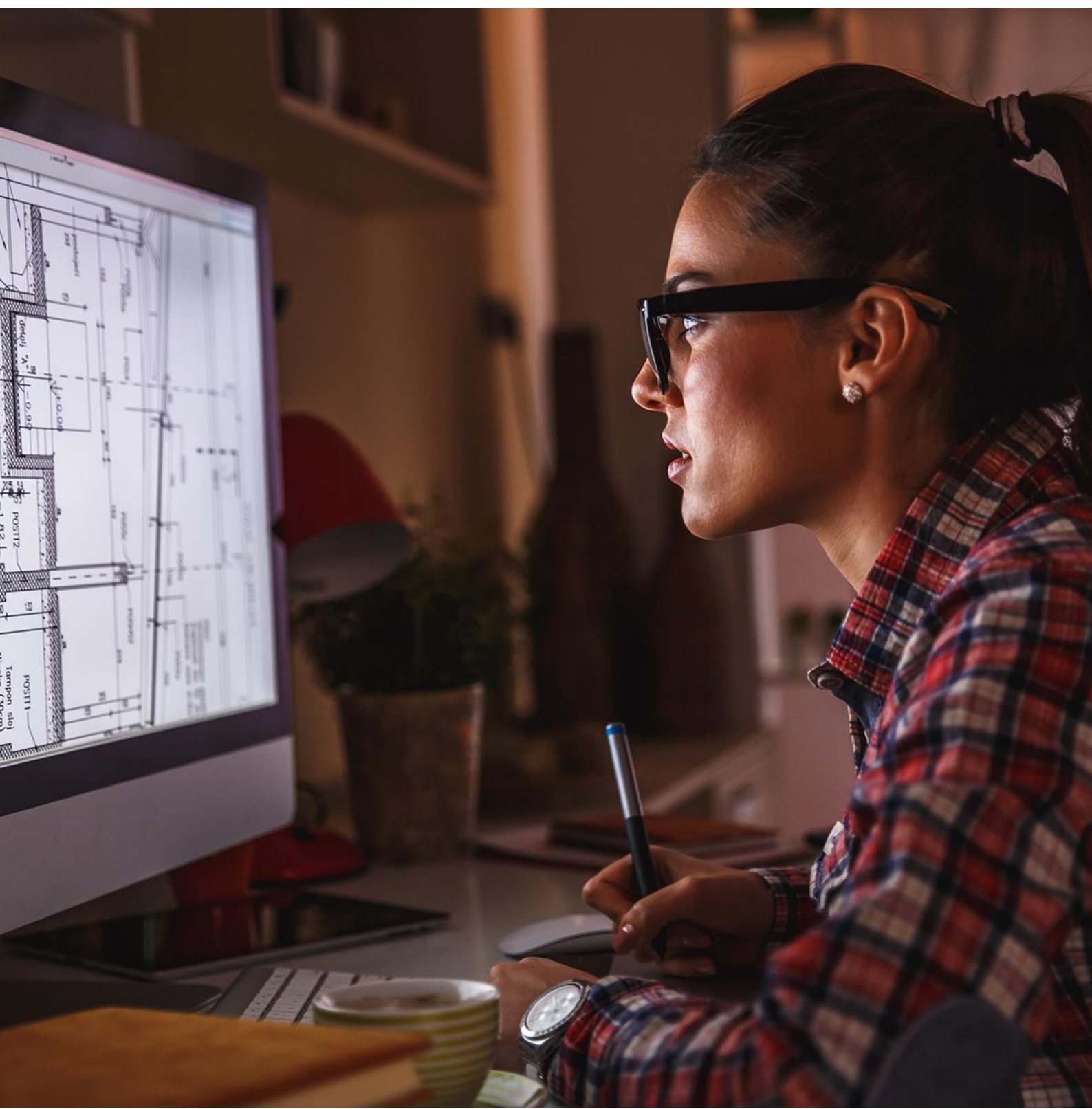
- Scale up and simplify access to business support for innovation adoption
- Oversee an end-to-end national research and innovation strategy in partnership with business that takes a systematic approach to development and adoption

4. Increase Innovation: Focus on improving the policy environment for business R&D

- Stabilise R&D by rapidly deploying new UKRI budget to restart and accelerate shelved innovation and deliver targeted support to shore up the RTO and university sector
- Adopt a long-term strategic approach to public funding underpinned by generous funding and incentives for business R&D
- Attract international investment by developing a globally compelling, well-marketed UK R&D offer

5. Upskill on Digital: Spur a gear change in ambition to boost the UK's digital skills pipeline

- Integrate digital skills into both short-term employment support and a fair, inclusive skills system by 2030: transform Job Centres into Jobs and Skills Hubs to help people into digital jobs and training, and map the digital skills proficiency needed at each educational level
- Develop an open and controlled immigration system that delivers the skills needed to grow the innovation economy



Deliver Dynamism: the UK as a global leader for creating and scaling companies, backed by pro-innovation regulation

Why does this matter?

A pro-innovation regulatory and competition environment attracts companies to locate in the UK, test new innovations, and scale for long-term success

- **For people:** an effective digital regulation and competition environment supports consumer choice and value for money, which is increasingly important during a period of economic turbulence.¹⁰ Effective regulation also builds public trust in the digital economy and supports consumer use of technology, from tackling hate speech online to setting standards for cybersecure internet connected (IoT) products.
- **For business:** in the wake of covid-19, a stable and pro-innovation regulatory and competition regime gives businesses much-needed certainty to make long-term investments, create jobs and innovate in the UK – from fostering breakthroughs in medical AI to supporting the highly innovative sharing economy. This is particularly important in the digital sector, which is growing nearly six times faster than the rest of the economy¹¹ and will help drive the Covid-19 recovery.
- **For the UK:** an effective regulatory and competition environment offers the UK an opportunity to forge a new image on the world stage, showcasing its international leadership in digital governance and competition, exporting regulatory expertise, digital standards and innovative ideas.

How do we compare now and what would success look like?

The UK digital economy is globally renowned, but growing regulatory fragmentation and uncertainty about the changing regulatory regime means our global leadership hangs in the balance

The UK is starting from a strong position, with a thriving digital economy worth £149bn¹² and investment in the technology sector attracting £10.1bn in 2019¹³, surpassing both France and Germany combined. When accounting for economy sizes, the UK is the second-best performer in the G7 in terms of unicorns created in the past year¹⁴ and boasts key advantages in areas including fintech, AI, cybersecurity, and gaming. As the UK recovers from Covid-19 and forges a new path on the world stage, start-ups, scale-ups and larger innovative businesses can help drive job creation, economic resilience and

sustainability. To harness this opportunity, the UK must do even more to remain a global digital powerhouse and provide the supportive conditions firms need to scale and innovate. Firms will be even more sensitive to the differences in operating environments between countries as they decide where to locate and innovate.

The UK regulatory and competition regime is already undergoing seismic change to adapt to the rapid pace of digitisation and innovation. The UK legal system gives companies a solid foundation, ranking 15th in the World Economic Forum's Global Competitiveness Index in terms of how well it adapts to digital business models.¹⁵ Yet, as new forms of digital regulation are developed, there is a pressing challenge to reduce fragmentation, enhance expertise and increase coordination across government and regulators.

UK firms – including start-ups – highlight this regulatory fragmentation challenge as a burning issue, particularly as they face both depleted cash reserves and stretched staff resource. For example, firms are concerned about the scope, proportionality, technological feasibility and overlap between proposed digital regulations. In 2020 alone, new regulation on content liability, data protection, digital competition, and a new digital tax will all be delivered by different government departments and regulators. There is a real risk for SMEs who do not have the expertise, resilience or resource to navigate an increasingly complex regulatory system, which will negatively impact their ability to compete.¹⁶ Both uncertainty and regulatory duplication jeopardise the UK's position as an attractive place for business innovation and investment.¹⁷

A pro-innovation regulatory and competition environment would renew the UK's reputation as the best place to invest, grow and innovate

The UK can enhance its place on the world stage by providing international leadership on the future of technology regulation, offering solutions that many countries are looking for. From internet regulation to modernising taxation, the UK can lead supranational collaborations that consider how to regulate on an international level. Businesses are eager to work with the UK government to develop these international outreach activities.

- **A vision for digital regulation:** Over the next five years, government can create a stable, futureproof and pro-innovation regulatory environment that attracts investment, supports new job opportunities for example in safety tech, and gives businesses the confidence to develop and test new ideas. World-class regulation can also help build public trust in technology and safeguard citizens through clear, responsible and technologically feasible rules. All digital regulation would be evidence-based, proportionate and based on gold standard stakeholder engagement.
- **A vision for digital competition:** A successful competition regime would stimulate companies to innovate and scale quickly by addressing the barriers to entry, including access to finance and data. Providing clear rules, quick decisions and proportionate interventions will allow all businesses to compete.

While measuring the impact of regulation is challenging, key indicators of success include extending the UK's lead in investment in technology, becoming a world-leader for the number of unicorns created per \$ trillion GDP, and increasing the percentage of people working in high-growth firms, indicating the ability of scale-ups to grow.

Exhibit 3 Success metrics

Metric ¹⁸	Current position	Vision position for 2025
G7 Metric		
Number of unicorns created in last 12 months per \$ trillion of GDP	2 nd (1.9)	1 st (3.6)
Employment in high-growth firms as % of total employment	8 th in Europe (19%)	3 rd in Europe (22%)
Extent to which legal framework adapts to digital business models	15 th in global WEF rankings	2 nd in global WEF rankings

What action must be taken?

Business welcomes government’s intention to support pro-innovation regulation. This should be matched by increased coordination and a strategic approach to policymaking

The government has stated a positive intention to better coordinate digital policy¹⁹ through the DCMS Markets and Regulation team and support pro-innovation regulation which firms welcome. Companies have also supported initial changes to the online harms proposals which now embed proportionality, education, business impact and certainty over the regulator. But as international competition ramps up, the UK starts its economic recovery, and businesses face a suite of domestic and international regulatory proposals, now is the time to translate this pro-innovation ambition into reality.



Recommendations

Deliver Dynamism: Take a strategic approach to digital regulation and invest in the institutions needed to deliver it

- 1. DCMS and HMT should develop a world-leading Digital Regulation Strategy to give companies the long-term certainty they need to invest in the UK, stimulate innovation and unlock new job opportunities. This should include:**
 - Coordinating digital regulations and reviewing regulatory remits: DCMS and HMT should develop a concise, cross-government strategy by mid-2021 to coordinate digital regulation, competition measures and review regulatory remits. Firms are keen to provide insight to help government map digital regulations, identify overlap and pinch points, and find opportunities to limit the regulatory burden on new challengers and scale-ups.
 - Resourcing the regulators: HMT must use the Spending Review to ensure regulators with major digital portfolios are appropriately resourced to cope with an expanding digital remit. This will ensure that regulators can better embed technical expertise and develop practicable and futureproof regulation, for example Ofcom's expected online harms regulatory remit. Firms are eager to work with government to develop a proportionate joint industry and government funding mechanisms for online harms regulation in the long-term.
 - Leveraging UK leadership: DIT and DCMS to create an action plan to showcase UK international leadership and expertise on digital governance, and advise on international applications of UK regulation. This plan should consider how other countries articulate a clear international offer for innovative companies to invest in their country, for example France's Viva Technology Summit which showcases France's leadership and provides a platform for senior executives to meet political leaders.
- 2. Regulators with major digital portfolios (CMA, Ofcom, ICO) should coordinate regulatory activity and create a comprehensive toolkit to boost business innovation by:**
 - Coordinating on cross-cutting strategic policy development, regulatory remit and best practice on business engagement, through regular meetings. This will help businesses understand the objectives of the regulators and plan for future changes in the market.
 - Diversifying the toolkit used to support business innovation. Regulators should outline a clear vision and set of tools to support pro-innovation regulation, as well as guidance on how firms can engage with regulators. Regulatory sandboxes are a positive tool for testing new business models and have facilitated the growth of UK fintech. These should be part of a wider toolkit which includes less resource-intensive tools for regulators that scale easily, such as market engagement strategies to provide regulatory clarification.²⁰

3. Support dynamic start-ups and scale-ups by tackling barriers to entry through data sharing and finance

- Unleash government-to-business data sharing by using the planned National Data Strategy to articulate an ambitious and coordinated vision that stimulates innovation, delivers public value and upholds trust - capitalising on lessons learned from data sharing during the Covid-19 response and supporting companies' own open data initiatives. Given the importance of data for competition, firms are also ready to engage on the next steps of the Furman review related to business-to-business data sharing.
- Support the growth of dynamic start-ups and scale-ups in every region of the UK by building on existing funding structures of the British Business Bank as well as exploring novel channels like a 'new 3i' so that UK has a scalable, stable and flexible financial infrastructure with long-term horizons.



Go for Gigabit: A gigabit-capable digital infrastructure network that supports a resilient, productive economy in every region

Why does this matter?

Covid-19 has highlighted the crucial need for world-class digital infrastructure across the UK. Gigabit-capable connectivity offers unprecedented opportunities for productivity, prosperity and the global attractiveness of the UK digital economy

- **For people:** access to digital connectivity is vital for economic, social and financial inclusion. From online banking to finding jobs and flexible working, being digitally connected and included matters. As Covid-19 has shown, nationwide gigabit-capable connectivity could allow 400,000 more people to work from home and give people greater flexibility in where they live. This means 270,000 more people could move to rural areas²¹, reducing pressure on transport networks and urban housing.
- **For business:** fast, reliable digital connectivity is the backbone of the digital economy, allowing people, machinery, buildings and entire cities to connect seamlessly. From video calling and cloud services to exporting globally from home, today's 'constantly connected' business environment depends on technologies like full fibre or fixed wireless that offer gigabit speeds and greater reliability. 5G will also unlock a raft of new industrial applications that can offer commercial advantages to UK business. These networks will drive the Covid-19 economic recovery, supporting innovation adoption and economic opportunity.
- **For the UK:** gigabit-capable connectivity offers a major productivity and job dividend across all regions, supporting greater technology adoption amongst the long tail of low productivity businesses. For example, nationwide full fibre is estimated to boost productivity by £59bn²² and create 1.2 million extra jobs by 2025.²³ Gigabit-capable networks will also help address wider societal issues such as cutting carbon emissions by reducing the need to commute, vital for a green economic recovery.²⁴ Delivering gigabit-capable digital infrastructure must be considered a crucial part of renewing UK infrastructure to unlock the potential of every region.

How do we compare now and what would success look like?

The UK is at a critical juncture for gigabit-capable network deployment. The recent uptick in full fibre rollout must be built on to deliver a fully gigabit nation

The UK has made significant strides in the last year to improve the availability of gigabit-capable broadband, with access to full fibre networks increasing from 3% of premises in 2017 to 12% in 2020.²⁵ The pace of rollout is accelerating and telecoms providers are providing record levels of investment to upgrade existing networks and deliver new networks across the UK. Mobile operators have also committed to better share their infrastructure and invest more to boost mobile coverage; 66% of the UK already has good 4G coverage from all four mobile operators whilst 5G coverage is at an early stage, with initial rollout in 40 cities across the UK.²⁶ The UK's digital infrastructure also remained resilient during the Covid-19 lockdown.

However, there is still more to be done to create globally competitive gigabit-capable networks across the UK and Covid-19 has created more urgency to deliver. Countries such as Spain and China have full fibre access to 77% and 66% premises respectively²⁷, and 4G mobile coverage needs to be consistently available across the UK.

Underpinning all of this is adoption. The uptake of digital connectivity is equally vital to support the long-term business case for widespread rollout of gigabit-capable technology. Currently, the UK ranks 4th in the G7 (excluding Japan for which there is no data) for uptake of high-speed broadband (100Mbps)²⁸ and Ofcom data suggests that take-up of existing superfast broadband has grown slowly, with 57% premises with access to superfast broadband now using it.²⁹

A gigabit-capable network nationwide, and expertise in 5G industrial applications, would keep the UK internationally attractive for technology development, adoption and investment

Over the course of this Parliament, government has a remarkable opportunity to accelerate the UK's digital future. With businesses assessing a country's digital connectivity when deciding where to locate and invest, the prize is significant. World-leading networks offer flexible working opportunities and create a hot-bed of digitally connected consumers and businesses with the expertise to adopt the latest technologies. This is an enticing offer for companies and investors, who will be more sensitive to these factors after the Covid-19 outbreak.

- **A vision for fixed broadband:** By 2025, gigabit-capable connectivity could reach 100% premises across the UK, matched with improved 4G mobile coverage that together drive the UK's economic recovery. A strong focus on vast and quick uptake of these increasingly available gigabit technologies would ensure that every home and business across the UK could maximise the benefits, from regional prosperity to social inclusion.
- **A vision for 5G:** Building on the UK's international success in 5G research, the UK could become a global leader on 5G industrial applications, exporting expertise in applications from advanced manufacturing to tourism, whilst leading in 5G mobile coverage.

Exhibit 4 Success metrics

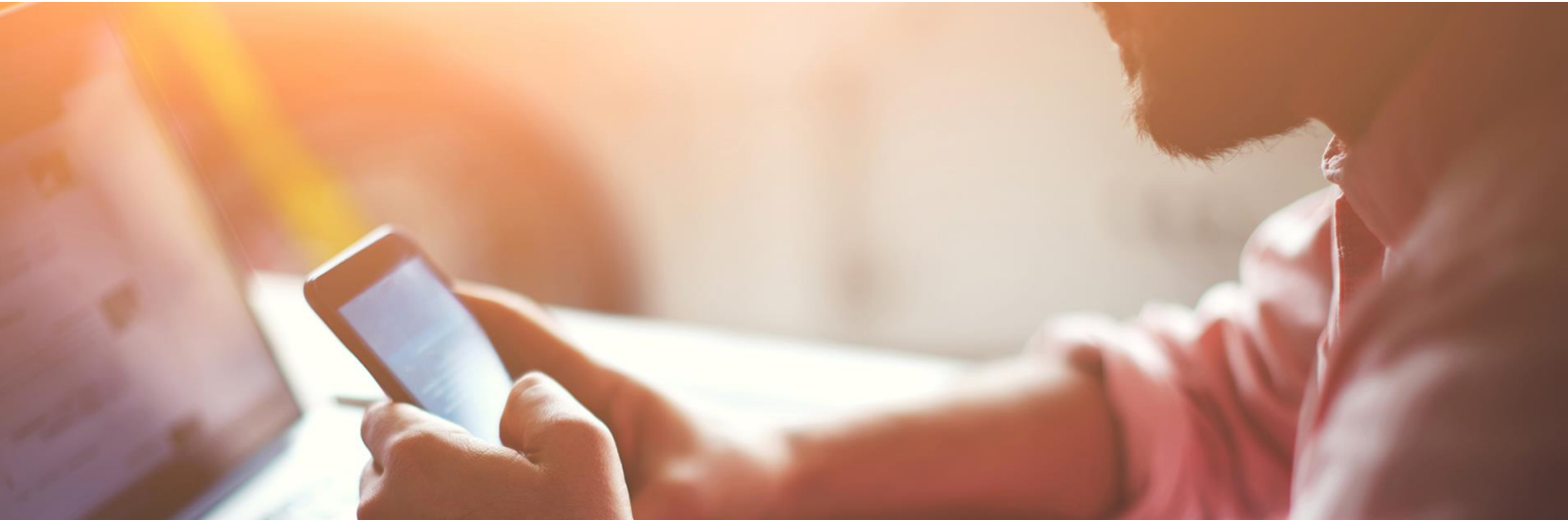
Metric ³⁰	Current position	Vision position for 2025
G7 Metric	5 th	2 nd
% premises with access to full fibre broadband	12%	75% (100% gigabit-capable)
Fixed broadband subscriptions over 100Mbps per 100 habitants	4 th of 6 G7 Countries (excl. Japan)	2 nd of 6 G7 Countries (excl. Japan)
% UK with 4G coverage from all four mobile operators	66%	95%

What action must be taken?

Firms welcome Government’s ambitious vision and urgent action is now required to deliver world-leading gigabit connections in every region

Business welcomes the Government’s ambitious vision for every premise to have access to gigabit-capable connectivity by 2025, including the £5bn committed to deliver both gigabit-capable broadband in the hardest-to-reach areas of the UK through the “Outside-In” programme and £510 million to address mobile not-spots through the Shared Rural Network.³¹ Together, these will make a significant difference to the UK’s attractiveness as a hotspot for innovation and technology adoption. Likewise, Ofcom has embarked on a regulatory reform agenda to support long-term, high-risk private sector investment and incentivise infrastructure competition.

But the UK’s ability to achieve this 2025 vision depends on quick action taken in the next 12 months as the UK builds back better. A range of urgent policy blockers remain, including access to properties, business rates, and ensuring regulatory reform incentivises investment. Government and Ofcom should address these to help businesses to invest more, upgrade networks more quickly, support the business case in potentially competitive areas like business parks and small market towns, and stimulate uptake. These blockers must be addressed concurrently to have a tangible impact on gigabit-capable broadband rollout.



Recommendations

Go for Gigabit: Match political pledges with accelerated action to deliver a gigabit nation that competes globally and builds back better from Covid-19

1. DCMS, HMT and Ofcom must embark on a 12-month policy drive to reduce the time and cost of gigabit network rollout

- Eliminate on-the-ground challenges that slow rollout and increase its cost, such as land access issues. Fast-track existing measures by the end of 2020 including legislation on tenant properties and new build developments, and go further on key issues, including exclusivity agreements and street works.
- Speed up procurement for the £5bn “Outside-In” investment, focusing initially on the hardest-to-reach 10% of UK premises, and help industry to address the potentially commercially-viable ‘missing middle’ areas such as villages, business parks and small market towns.
- Ofcom must ensure that proposals for regulatory reform in the Wholesale Fixed Telecoms Market Review improve the long-term business case and build investor confidence – with new regulation on track to be delivered in early 2021. Greater clarity on Ofcom’s ‘fair bet’ approach would give investors more confidence and impetus to invest over the long-term.
- Use the fundamental business rates review announced at Spring Budget 2020 to reform business rates to enable further rollout of gigabit-capable connectivity, and extend the current relief to 2029 to align with Scotland until wider reform takes place. Lower business rates bills mean that firms will have more capital to invest quickly and therefore deliver gigabit-capable connectivity further and faster. Reform must be technology-neutral and cover all infrastructure, focusing on the outcome of gigabit speeds and greater reliability. Share evidence and insight with devolved nations so that the whole UK economy can benefit.

2. Government should form a connectivity taskforce to set a strategy to spur uptake of gigabit connectivity across businesses and consumers

- Whilst connectivity is at the forefront of many people’s minds due to reliance on home working, government should use the opportunity to embark on coordinated demand stimulation. This taskforce should advise on a strategic and evidence-based approach to stimulate business and consumer demand for gigabit-capable broadband connections and 5G. Amalgamating gigabit-capable connectivity adoption with wider government work on business and public sector technology adoption must be an early priority, such as the BEIS Business Basics initiative, as well as lessons learned on technology adoption during Covid-19.
- The taskforce should be overseen by the Digital Infrastructure Minister, and include HMT, BEIS and DCMS, devolved administrations, business groups, Ofcom, Be the Business and consumer groups such as Which. The CBI would be interested in co-chairing the taskforce and bringing business insight to inform an effective strategy. The taskforce should report by Summer 2021 at the latest.

3. Update the UK's 5G strategy to make the UK a global ambassador for 5G industrial applications, and work with business to unlock 4G mobile coverage in all regions

- Focus the 5G strategy on accelerating both public sector and business experimentation and adoption at scale, and work with partners across the UK to share best practice. Publish key learnings from 5G Trials and Testbeds Programme to date, updating as new insights emerge from the Rural Connected Communities and 5G Create projects. The CBI will also be engaging further with businesses to highlight the value of gigabit-capable digital connectivity, including potential 5G applications.
- Quickly ease planning restrictions on 5G infrastructure by fast-tracking proposed reforms to permitted development rights to support the deployment of 5G and extend mobile coverage, and work to harmonise planning law changes across the UK.
- Stay on track to implement the Shared Rural Network by 2026, delivering on the partnership with business to address mobile not-spots.



Accelerate Adoption: British business at the front of the pack globally for innovation adoption

Why does this matter?

Embracing innovation has enabled large sections of the business community to survive the impact of Covid-19. Accelerating adoption will drive business resilience, agility and productivity to build firm foundations for the future

- **For people:** productivity gains stemming from greater innovation adoption can drive up wage growth. Achieving a productivity profile more like Germany could fuel a reduction in income inequality by 5%.³² As the period of lockdown demonstrated, innovation adoption can transform the way people stay safe, connect with families, access services and undertake their jobs.
- **For business:** the move to more digital solutions in the immediate Covid-19 outbreak was a global phenomenon. Microsoft Teams saw an increase of 31 million active users in one month during the height of the pandemic.³³ Increasing the rate of innovation uptake allows UK businesses to thrive in a rapidly changing and increasingly competitive national and international market. Firms that take on new ideas and technologies will be able to weather future sector disruption and grow.
- **For the UK:** this period presents a unique opportunity to capitalise on increased appetite for innovation adoption to close the gap between the “best” and the “rest” when it comes to business innovation adoption. It is estimated that at least 55% of labour productivity growth will come from firms adopting existing best practice.³⁴ Greater innovation diffusion could add over £100bn to UK GVA.³⁵



How do we compare now and what would success look like?

The UK is home to global innovation leaders but, across the economy, UK businesses have not kept pace with peers on adopting tried and tested innovation

The UK has a great record and a strong reputation for cutting-edge innovation. The highest performing businesses drive this through outstanding R&D, collaboration with world leading universities and dynamic leadership.

However, innovation will not realise its full potential without widespread adoption. In the UK, tried and tested innovation is not being taken up as quickly or as widely as our peers, minimising the benefit in the UK of new developments. In 2017, the proportion of UK businesses with basic digital capabilities including websites, internet trading capabilities, customer relationship management and enterprise resource planning systems were lower than the proportion of Danish businesses that had adopted them eight years earlier, in 2009.³⁶ This failure to adopt and diffuse innovation throughout the economy has contributed to our relatively low productivity levels and has undoubtedly made it more challenging for some firms to adapt to changes brought about by Covid-19. The UK has put in measures such as Be the Business and Made Smarter, but we must go further.

Addressing the UK's weaknesses on readily available technology adoption can also pave the way for greater adoption of the cutting-edge technology with potential to drive economic growth. The UK has a competitive advantage in the development of cutting-edge innovations, such as AI and virtual reality technologies. Major government initiatives such as the AI sector deal and electric vehicles testbeds highlight a welcome focus for the UK to be world-class in emerging technologies. However, compared to our peers, the UK has been reluctant to capitalise on emerging opportunities with strategic investment to support commercialisation and adoption in the UK.

Greater innovation adoption will increase business resilience and catalyse needed economic growth

UK business and government have an opportunity to capitalise on the appetite for, and experience of, rapid innovation adoption during the Covid-19 pandemic to drive recovery, increase international competitiveness and unlock benefits for the wider economy:

- **Raising the baseline of basic business innovation adoption:** The UK can close the gap with countries such as Denmark, Germany and Belgium which have been a step ahead when it comes to businesses embracing and successfully diffusing innovation.³⁷ Through a concerted effort, comprised of direct funding intervention and mechanisms to support knowledge sharing between firms, innovation adoption among business can support economic recovery and build resilience for UK plc.
- **Providing a springboard for accelerating the adoption of cutting-edge technologies:** Tried-and-tested technologies like cloud computing lay the foundation for the adoption of powerful emerging technologies. For example, by consolidating an organisation's data and improving its consistency, CRM provides a basis for advanced data analytics. Improving the skill and will for innovation adoption will increase the emergence and uptake of cutting-edge technologies.

- **Ensuring SMEs can operate in the disrupted market:** SMEs make up 99% of businesses in the UK and many have been acutely affected by Covid-19. As the backbone of the wider economy, government should act as a catalyst to ensure these firms are provided with the technical assistance, knowledge and insight that will allow them to make informed decisions about where to place investment as employee expectations and consumer patterns shift. With this support, SMEs can help to drive an increase in the digital maturity of UK supply chains and help to improve productivity and resilience across sectors.

Exhibit 5 Success metrics

Metric ³⁸	Current position	Vision position for 2025
G7 Metric Business implementation of digital technologies across G7	2 nd	1 st
Business investment in AI (CBI Tech Tracker – “At what stage is your businesses investment in these new technologies?”, 2019)	33% of businesses operationalised AI	45% of businesses operationalised AI
% of SMEs introducing product or process innovations	16 th out of 36 European countries	4 th out of 36 European countries

What action must be taken?

Recent government measures have laid the groundwork for addressing the failure to adopt. However, there is now an opportunity to be bold so the benefits of business innovation are fully realised

While this failure to adopt has often been a policy blind spot, initiatives such as Made Smarter, Be the Business and the Government’s Productivity Review have proved positive interventions, committing resources to addressing the challenge. Now is the time for bold ambition to extend the reach of these initiatives and include innovation adoption as part of an end-to-end national research and innovation strategy that creates lasting change.

Recommendations

Accelerate Adoption: Join up, scale up and simplify government action on innovation adoption

1. Scale up and simplify access to business support for innovation adoption

- BEIS and MHCLG should urgently deliver the UK Shared Prosperity Fund over the next year to support SME innovation adoption, fully replacing European funding and simplifying access.
- Government should commit long-term funding and accelerate scale up of the Made Smarter programme across the UK. This should begin with £50m to fund scale up in three additional areas: Lincolnshire, Sheffield City region and North East/Tees Valley.³⁹
- The new Productivity Institute should consider the interventions set out in the Productivity Review in light of Covid-19 and publish timelines and actions to deliver each.
- When it is launched, BEIS should direct micro businesses and SME's to the new Be the Business digital platform 'Rebuild', as part of the process when applying for business support.

2. BEIS should oversee an end-to-end national research and innovation strategy in partnership with business that takes a systematic approach to development and adoption

- Deliver a bold end-to-end research and innovation strategy, including expanding Innovate UK's remit to support businesses to adopt innovation. This will help to create a systematic approach to innovation support, ensuring the UK can convert its world leading R&D capabilities into commercial success.
- Sustain the UK's role as a global leader in AI through the development of a regulatory and support ecosystem that promotes adoption, innovation and ethical development of the technology. Government should continue to support the work of Centre for Data Ethics and engage closely with industry and civil society in the development of a regulatory approach that promotes innovation and builds trust in the technology.
- Government should take a leading role to stimulate research and investment into new technologies. The UK government should set out a bold and systematic approach on key emerging technologies as it has with the UK National Quantum Technologies programme and AI sector deal. This includes drawing on the evidence and expertise of UKRI, the Office for Science, and departmental Chief Scientific Advisers to scan the horizon and identify the most important emerging technologies to target. In particular, CBI research suggests that distributed ledger technology (DLT) tops the list as the cutting-edge innovation most set to make an impact in the next five years, along with quantum computing and augmented / virtual reality (AR / VR).⁴⁰

- Cabinet Office should embed learnings and update procurement mechanisms across Government departments to drive greater innovation uptake, including a greater emphasis on value not just cost.



Increase Innovation: The UK as a science and technology leader, harnessing R&D investment to deliver a stronger recovery, tackling major societal challenges

Why does this matter?

The pandemic has provided an opportunity to see R&D in action, from vaccine development and the ventilator challenge, to disease modelling to inform decisions. It is the foundation for new knowledge, techniques, and technologies. Increased investment will grow UK capability and capacity to solve problems and improve everyday lives, now and in the decades to come

- **For people:** research and development lies at the heart of social development and has transformed the way we go about everyday life. GPS-devices have revolutionised the way we travel and digital media has transformed the way we connect and learn. It is also the foundation for advances we depend on, from data storage to medical breakthroughs.
- **For business:** investment in R&D can improve business performance. Through investment in R&D a company can develop and enhance its products, services, and processes leading to growth opportunities, production efficiencies, competitive edge and commercial success. That's why firms that invest in R&D are significantly more productive than those that do not.⁴¹
- **For the UK:** R&D has a critical role in tackling major challenges facing society – from supporting healthy ageing to tackling antibiotic resistance and transitioning to a zero-carbon economy. It also underpins sustainable growth and improvements in living standards in a knowledge economy like the UK. Through R&D, businesses can produce better quality products and services while using fewer natural and human resources, driving up production and wages.

How do we compare now and what would success look like?

The UK lags behind international competitors on R&D investment but the historic uplift in public investment announced by Government puts the UK on the map

The UK has a range of fundamental strengths when it comes to research and development. It is home to a world-leading research base and a rich pool of high-quality research talent. However, the UK has historically trailed behind other countries when it comes to overall levels of investment, failing to capitalise on research strength to deliver on innovation potential. In 2017 business expenditure in R&D was amongst the lowest in the G7 and government funding of R&D was the lowest of all G7 countries.⁴²

The country's current performance is a consequence of a long-term failure to raise national R&D spend. While other countries have been making strides in growing national R&D investment UK investment intensity as a percentage of GDP has remained broadly static for the past twenty years.⁴³ In this time the UK has dropped from being one of the leading investors in the G7 to being close to the bottom of the table.

Government has shown meaningful intent to turn the dial on this performance by committing to a major uplift in public R&D funding at the Spring Budget 2020, doubling public sector R&D investment to £22 billion by 2024/25.⁴⁴

New investment to reinforce research strength and deliver on innovation potential

The new investment, if coupled with a focus on development and commercialisation, could be transformational for attracting private investment, growing businesses, creating high value jobs, and developing new technologies, products and advances in the UK.

Exhibit 6 Success metrics

Metric ⁴⁵	Current position	Vision position for 2025
G7 Metric	5 th	4 th
Total investment in R&D as a % of GDP (GERD)	1.7% of GDP in 2018	2.4% of GDP ⁴⁶
Private sector funded investment in R&D as a % of GDP⁴⁷	5 th 1.2% of GDP in 2017	3 rd 1.8% of GDP ⁴⁸
Public sector funded investment in R&D as a % of GDP⁴⁹	Joint 6 th 0.4% of GDP in 2017	2 nd 0.8% of GDP

What action must be taken?

Use the historic uplift in investment to stabilise R&D, and build on regional research strengths to make the UK the best place to develop, test and bring to market

The immediate priority for government action must be to stabilise R&D, ensuring that businesses and universities have the confidence and capability to restart R&D activities paused due to Covid-19. The closure of facilities has impacted the running of live projects and independent research centres have experienced a significant loss of income from their commercial customer base. Small early stage companies have faced cash flow issues while universities are facing a substantial loss of income from international student fees which impacts on research budgets. Government must act to protect capabilities, minimise scarring effects and rebuild confidence.

Looking beyond the crisis, policymakers must prioritise measures that maximise private sector R&D activity and investment in the UK. Of the fourteen countries that have achieved the scale of increase in investment the UK is aiming to achieve almost every country relied on substantial increases in private sector investment.⁵⁰ Improving the environment for business R&D must be the central focus for government action.

There are also real opportunities to redress regional economic inequality through strategic R&D investment. Investment is currently highly concentrated in certain parts of the UK with three regions accounting for 52% of gross spend.⁵¹

To raise UK R&D intensity and deliver on innovation potential government must focus on changing four key aspects of the policy environment.

- **A long-term strategic focus:** A commonality among countries that have achieved significant uplifts in national R&D investment is the longevity of policy strategy. For instance, Germany has had a 'High Tech Strategy' in place since 2006 and South Korea has set out a series of five-year plans for science and technology since 2001. Adopting a similar approach in the UK would help businesses identify opportunities for investment and provide the certainty and assurances they need to make long-term decision making.
- **Funding and incentives to leverage new business investment:** Public support for R&D is highly effective at stimulating additional business spending with every £1 leveraging £1.36 of private spend.⁵² Increasing public support for business R&D will therefore have a critical role to play in stimulating the business investment needed to grow investment and capitalise on the UK's innovation potential. In allocating new funding attention will need to be paid to support for commercialisation and 'late-stage' development activity which businesses consistently highlight as a gap in the UK R&D offer.
- **Faunting the UK's R&D offer:** The UK has been one of the most successful countries in attracting foreign investment for R&D. However, since 2014 there has been a drop off with investment falling from £4.1bn in 2014 to £3.3bn in 2017.⁵³ This downward trend is concerning as the UK will need to grow investment from all sources to reach the 2.4% target. To address this challenge

government should take action to improve and proactively market the UK's international offer.

- **Embedding a culture to fail fast and pilot new approaches:** In pursuing future policy reform government should learn from international good practice, trial new approaches and be prepared to take risks with innovation funding. Establishing a new UK ARPA style agency is a key opportunity to take a high-risk, high-reward experimental approach to developing new cutting-edge technologies.

Recommendations

Increase Innovation: Focus on improving the policy environment for business R&D

1. Stabilise R&D by rapidly deploying new UKRI budget to restart and accelerate shelved innovation

- UKRI and BEIS should work at pace to publish a forward look calendar of funding opportunities to enable businesses to look ahead and allocate resources to long term innovation programmes.
- Government should work closely with the higher education sector to identify the scale of support required to safeguard university research activities. To mitigate the immediate impact of lost international student fees, UKRI should meet the full economic cost of grant funded research.
- HM Treasury and BEIS should deploy targeted funding to independent research centres to help shore up damaged commercial revenue streams and to avoid the continued furlough of skilled staff. For instance, this could be an opportune time to use departmental R&D budgets to commission research to inform new challenges facing government.
- UKRI and BEIS should set up a task and finish group focussed on embedding learnings from the many examples of rapid, collaborative research and innovation that have taken place during the crisis.

2. Set out a long-term strategic approach to public funding underpinned by generous funding and incentives for business R&D

- HM Treasury should use the upcoming Spending Review to establish a five-year financial framework with the objective of providing long term certainty for business science investment. This framework should grow funding available for Innovate UK's 'Open' funding programme and target increased support towards 'late stage' development activities, demonstrator projects and testing facilities.
- To ensure business insight is woven into the fabric of the organisation UKRI should establish a 'business advisory group'. This group should function as a channel to inform strategy, policy development and operational performance across UKRI and be made up of senior UKRI, BEIS and business representatives.

- Strengthen the UK's ecosystem of applied research institutions to boost support for commercialisation and drive regional R&D investment. Specifically, BEIS and UKRI should strengthen the purpose of the Catapult Network by establishing a series of 'Catapult Quarters'.⁵⁴ Catapult Quarters would serve to promote business engagement with the network, improve visibility of regional innovation capabilities and accelerate the development of innovative clusters across the country.

3. Attract international investment by developing a globally compelling, well-marketed UK R&D offer

- UKRI and DIT must develop a compelling high-level pitch on 'why the UK is the best place to locate and grow your R&D activity' and should take steps to strengthen international communication of this pitch. This should include an online portal targeted at international investors that signposts sources of funding support and showcases the range of assets, facilities and infrastructure available across the UK.
- HM Treasury should regularly benchmark the UK's tax credit regime against international peers so that the credit is internationally recognised as world-class. To ensure the credit keeps pace with the with modern R&D practices HM Treasury should use its recently announced consultation to widen the scope of eligible activities. Businesses are keen to provide evidence and work with HM Treasury to ensure the credit evolves to reflect the realities of modern R&D practices.
- BEIS should set out a framework for the design of a new UK ARPA agency. This should ensure the agency has; clear channels for business engagement, a long term-funding model, a global brand and a clear focus towards developing a new culture for high-risk innovation. The CBI is keen to support government's engagement with businesses as it develops plans for the agency.



Upskill on Digital: A flexible digital skills system that prepares people for jobs in technology and innovation, and attracts companies to locate in the UK

Why does this matter?

Digital skills are the cornerstone of inclusion, and will help to unlock a jobs-rich economic recovery that harnesses the benefits of technology and innovation

- **For people:** digital skills are the key to digital inclusion and an important building block of a modern, fair economy. Basic digital skills are necessary for a host of essential online activities such as booking GP appointments, connecting with others and filling out job applications. People with advanced digital skills can also expect to earn over £11,000 more per year than those in high skilled but not digital roles.⁵⁵
- **For business:** people are at the heart of innovation, ideas and technology, and digital skills are their tools. As the economy recovers from the pandemic, all employees will need essential digital skills to use recently adopted technologies at work and innovate. Many businesses will also need some employees with advanced or specialist digital skills, such as software engineering or AI skills, to develop new, technology-enabled products and services.
- **For the UK:** a strong digital skills pipeline is part of the answer to radical job changes, growing unemployment and intergenerational fairness. As the nature of work changes, 26 million workers will require upskilling as their role evolves, with a further five million going through significant job changes that require retraining.⁵⁶ Developing digital skills capabilities across the UK quickly will be a crucial part of ensuring that everyone is included in the UK's economic recovery.



How do we compare now and what would success look like?

The UK is middling internationally, with major talent gaps impacting business innovation and significant reskilling required across the UK workforce in the wake of Covid-19

There are two elements to the digital skills pool in the UK: how the UK fares in building a sustainable pipeline of domestic talent and how attractive the UK is for people and companies to locate here.

The UK's domestic pipeline for digital skills is at a tipping point. Business demand outstrips supply and millions lack basic digital skills

The UK digital skills pipeline is struggling. Firms are fishing in a small pool for digital talent; CBI research shows that two thirds of firms are already experiencing digital skills gaps – especially in data analytics and cybersecurity - and demand is set to skyrocket.⁵⁷ This is impacting businesses' ability to adopt new technologies and innovate. The UK is also part of an accelerating global race for digital skills. Whilst the UK currently ranks 4th in the G7 for sufficient digital skills in the workforce, international competition for talent is fierce and many countries have dedicated national programmes to boost supply, such as Singapore's SkillsFuture for Digital Workplace.

At the same time, the UK faces twin challenges of an expected rise in UK unemployment due to Covid-19 and a growing generational skills challenge. Nine in ten workers will need some form of reskilling by 2030 to ensure that everyone is ready for a technology-enabled workplace and benefits from increased job satisfaction and higher wages. Yet with 11.7 million people in the UK lacking basic digital skills⁵⁸, a step change is needed adult learning and upskilling.

Firms are already taking important steps to upskill the workforce, engaging with schools and government to shape future courses, such as Trailblazer apprenticeship groups, and creating their own training, such as Google's Digital Garage, Microsoft's Digital Skills Programme, or Lloyd's Digital Academy. Universities and companies are also working together, for example through the Institute of Coding which helps meet demand for digital skills through short courses, degrees and 'return to tech' courses for women after career breaks. Business leaders play an important role; leaders are much more likely to encourage colleagues and staff to undergo similar courses when they've received digital training themselves.⁵⁹ With 93% of firms already taking action to address their digital skills gaps and three quarters expecting to invest more in training on digital technologies in the next year, companies are aware of the challenge ahead.⁶⁰



The immigration system also impacts the UK’s ability to attract the international talent needed for the innovation economy

Getting the new immigration system right is a top priority to ensure the UK can access and attract the digital skills it needs, whilst the UK builds up the domestic pipeline. The UK is currently in the middle of the pack in terms of attractiveness as a place to locate for high-skilled immigrants, ranking 16th out of 35 OECD countries.⁶¹ Even though immigration rules have yet to change, the UK’s digital and innovation economy has already found it harder to attract the people and skills from overseas it needs to thrive since the result of the EU referendum in 2016. Continued rhetoric from government about reducing numbers has also made the UK a less attractive destination.

A strong pipeline of domestic digital skills talent, combined with an open and controlled immigration system, will unlock widespread innovation and ensure everyone can take part in the Covid-19 economic recovery

Over the course of this Parliament, government can create the foundations for inclusive and sustainable economic success by:

- Creating a world-leading domestic pool of digital talent:** In the coming years, having a world-leading digital skills pool will drive UK competitiveness and the Covid-19 economic recovery, as well as ensuring that the UK population is prepared for the future of work. With skills availability a key factor for firms deciding where to innovate and expand, the UK can forge a new place in the global digital race by creating an extensive pool of digital talent with which to leverage competitive advantage. Success over the next five years means accelerating the path to digital work and training, being on track for the entire UK workforce to have basic digital skills⁶² by 2030 and ensuring that businesses have the skills they need to excel in emerging technologies.
- Creating an immigration system fit for the digital age:** Government can create an open and controlled immigration system that meets the adapting needs of UK business, from AI researchers to data technicians and groundworkers needed for the rollout of gigabit-capable broadband technologies. Many of these roles aren’t only important in technology firms, but throughout the economy, from retail to manufacturing.

Exhibit 7 Success metrics

Metric ⁶³	Current position	Vision position for 2025
G7 Metric Active (domestic) population possessing sufficient digital skills (e.g. computer skills, basic coding, digital reading)	4 th	2 nd
Attractiveness of country to high-skilled immigrants	16 th of 35 OECD countries	8 th of 35 OECD countries

What action must be taken?

The next five years are critical for the UK to create an inclusive, fair and globally competitive economy, based on widespread digital skills and high employment in technology and innovation

Government has already taken positive action on digital skills, including launching a Skills Toolkit with free online training courses in digital and numeracy skills, £5 million for digital retraining in the West Midlands, funding for AI and data science postgraduate courses, a £1 million Digital Skills Innovation Fund to help underrepresented groups access digital skills, and Local Digital Skills Partnerships that match local demand and supply. Over the next five years, this activity must be extended and incorporated into wider UK skills system reform that has digital skills at its heart.

The scale of the challenge now requires an ambitious partnership of the century between business and government to develop a world-leading pool of digital talent that addresses the UK's skills needs – both in the immediate Covid-19 economic recovery and over the longer term as the UK adapts to rapid technological change. Action is essential to encourage firms to do more, support at-risk workers and embrace lifelong learning. UK businesses are eager to work with government to develop this bold vision and strategy. The CBI will release a report in 2020 with bold ideas for an ambitious partnership of the century on reskilling. This will include ideas on how to structure and fund the significant reskilling required, including increasing overall business investment, incentivising individuals to embrace lifelong learning and supporting those with the most radical retraining needs.

Likewise, government has also made progress on immigration. Commitment to remove the cap on skilled visas, lower the £30,000 salary threshold and introduce a new two-year graduate visa for international students in the new immigration system will all support the digital and innovation economy. But the new immigration system must be accessible and affordable to businesses of all sizes on day one. Otherwise even if digital roles are permitted under the new system, employers will be unable to practically hire the people and skills from overseas they need to grow.



Recommendations

Upskill on Digital: Now is the time for a gear change in ambition, funding and digital reskilling

1. DfE and DCMS must integrate digital skills into both short-term employment support schemes, and a longer-term fair and inclusive skills system by 2030

- Transform Job Centres into Jobs and Skills Hubs⁶⁴ to support young people into digital jobs and training, matching well-documented business demand for digital skills, such as data analytics, with training supply: By harnessing the expertise of colleges, universities, unions, businesses and Local Digital Skills Partnerships, local resources can be directed where they are most needed. The Jobs and Skills Hubs should have two roles: providing rapid matching of people to new job opportunities; and sourcing high quality training in areas of future demand in the local labour market. Business can advise government on which reskilling approaches will help support increased diversity in digital roles.
- Back this up with a Future Skills Fund: This should be made available locally to augment the ambition of the National Skills Fund, with additional funding targeted at the skills for tomorrow where there will be greatest future demand, including digital.
- Map the digital skills proficiency needed at each educational level⁶⁵ and embed digital skills within a broader, knowledge-rich school curriculum in England.⁶⁶ A key aspect of getting future generations ‘work ready’ will be equipping them with the digital skills they need to thrive in the modern workplace.
- Continue measuring the advanced digital skills gap and increase support for conversion courses to address this need, with a specific focus on improving diversity in technology.

2. Government must develop an open and controlled immigration system that delivers the skills needed to grow the innovation economy including the flexibility to quickly address digital skills gaps as they arise, and before they have a long-term economic impact:

- Adjust the Shortage Occupation Lists in all nations to exempt skills threshold rather than only salary. Government’s time-bound ambition in some areas, for example achieving gigabit-capable connectivity UK-wide by 2025, will require flexibility to address recognised and time-sensitive skills shortages such as full fibre engineers.
- Create a route for self-employed and freelancers in the new immigration system: vital people and skills from Europe and around the world currently contribute to the UK’s digital and innovation economy on a self-employed or freelance basis. The new immigration system must protect this valuable pool of talent.

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