DEMOS

POWERING THE SUPERPOWER

UPGRADING THE UK'S INDUSTRIAL INFRASTRUCTURE TO UNLOCK TECHNOLOGICAL TRANSFORMATION FOR GROWTH

ANDREW O'BRIEN
DAN GOSS

DECEMBER 2023

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15 Whitehall, London, SW1A 2DD
T: 020 3878 3955
hello@demos.co.uk
www.demos.co.uk

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AN INCLUSIVE ECONOMY

This project is part of Demos's work to help create an ***Inclusive Economy.*** A decade and a half of stagnant productivity and low growth in the UK has made households poorer, put pressure on public services and limited people's social and economic security. Those with the least have been hit hardest. We need to get the economy thriving again - and technological development will be key to this. But the benefits of this technological development cannot be shared only among the researchers and tech companies. They must spread across all UK businesses and organisations. To do so, technology must come with the industrial infrastructure that allows it to be deployed across the whole economy, improving productivity across all sectors and regions of the UK.

Addressing these problems is therefore of critical importance to an inclusive UK economy. But to overcome the challenges in a way that suits the needs of those affected, we have to listen to businesses. We have done this through polling of 500 businesses and workshops with business experts, putting those directly affected by our policy recommendations at the heart of the research.

FOREWORD
BY JAMES CRADDOCK

Our Victorian ancestors are rightly celebrated for their industrial ingenuity, with many of their inventions still at the heart of our daily lives, although in many cases with some upgrades. This formed a solid foundation for even more technological innovation throughout the 20th and 21st Century, from the creation of television, jet engine and bagless vacuum cleaner to Tim Berners-Lee's World Wide Web, which forms the bedrock of today's digital economy and society.

But what about tomorrow? The technological revolution shows no signs of slowing down with data, automation and artificial intelligence set to continue changing the ways we do business and live our lives, as well as having a huge impact on changing geopolitical forces. If offered a choice of being at the forefront of this revolution and helping shaping our future, or watching from the sidelines and being forced to adopt someone else's vision for the world or being left behind, there is only one option. But this requires investment and the infrastructure to enable us to compete on a global stage.

Part of this infrastructure is the industrial and logistics space (e.g. storage, distribution, and digital infrastructure) which, despite its importance, often remains undervalued and misunderstood.

The global Covid-19 pandemic brought the sector to the fore as the need to get global supplies to the places that needed them urgently became crucial. Furthermore, with much of the world in lockdown, our lives increasingly moved online hugely accelerating the need for last-mile deliveries and increasing the requirements for goods and supply chains to be located closer to home.

And while the political debate is often on the need for more housing, the need for the industrial infrastructure, including data centres, that provides the jobs for the people that live in them and underpins the economy is often not given the profile it deserves.

For over 103 years, SEGRO has been developing and managing industrial space to enable businesses to thrive. Our 1,400 customers range from global corporates to small innovative companies, and include household names such as DHL, Mars, Ocado, Netflix, Tesco, Amazon and British Airways and some of the world's largest data centre operators.

SEGRO is pleased to commission Demos to take a fresh and independent look at the debate around the UK's industrial and logistics sector – where we have been successful, where we could have done better and perhaps most importantly, how we grasp the opportunities that lay ahead of us in the future. In some areas it doesn't make for comfortable reading, but unless we understand the problems we can't fix them.

While the UK government's aspirations for technology-driven economic growth are welcome, there is so much more to be done to recognise and plan the industrial space needed given it forms a critical part of the UK's national infrastructure. This in turn will enable the private sector to invest in the industrial facilities needed to achieve this and help the UK continue its proud heritage of industrial innovation but within a truly digital world.

The recommendations set out in this report provide the framework for this to be implemented and we look forward to working with policymakers to help unlock the growth of the sector and deliver the ambition of making Britain a science and technology superpower by 2030.

James Craddock
UK Managing Director, SEGRO

EXECUTIVE SUMMARY

Every politician is focused on increasing growth. Government, opposition and commentators have linked this challenge to the role of technology, which can boost growth by increasing productivity and enabling the UK to gain a global competitive advantage.

For this reason, the government has a vision to make Britain a science and technology superpower by 2030. Meanwhile, at the core of Labour's industrial strategy is keeping the UK at the 'technological frontier' and diffusing technology.

Unfortunately, there is no plan to turn this from rhetoric to reality.

Central to our quest to turn the UK into a technological superpower and unlock millions of high quality jobs is the state of our industrial infrastructure: the storage and distribution facilities as well as the physical and digital infrastructure that business depends upon.

Policy makers have ignored the critical importance of this industrial infrastructure. The lack of these assets is one of the reasons why the UK's productivity has been so low in recent years and will continue to act as a drag on our development and adoption of new technologies.

Nearly a third (30%) of businesses say that they are not confident the UK will be an attractive place to do business in a decade's time.

The lack of infrastructure means that we estimate that over 350,000 businesses, employing 3.8m people and with a combined turnover of £666bn a year lack access to the right buildings and facilities for their businesses. At a time when the UK economy is struggling to generate sustained levels of economic growth, this problem is something that policy makers cannot afford to ignore.

We identify six barriers and bottlenecks behind the UK's inability to meet demand for high quality industrial infrastructure: power, buildings, transport, planning, skills and partnership with government.

TO ADDRESS THESE SIX BARRIERS, WE OUTLINE SIX POLICIES TO TACKLE THE MOST PRESSING CHALLENGES:

1. Ensure that the Department for Science, Innovation and Technology's cross-government action plan to make the UK a technology superpower addresses our industrial infrastructure needs.
2. Merge the National Infrastructure Commission with the UK National Infrastructure Bank to create a 'Super Agency' - the National Infrastructure Delivery Authority (NIDA) to advise, plan and finance major infrastructure projects across the UK.
3. Create a presumption in favour of development of industrial infrastructure within the National Planning Policy Framework (NPPF).

4. Increase and ring-fence spending on local authority planning teams with central government investment over ten years.
5. The Department for Energy Security and Net Zero should work with Ofgem and National Grid ESO to create a "Priority Power Access Plan" which puts industrial infrastructure projects at the front of the queue for grid access and provide investors with certainty.
6. Extend 'Investment Zone' Structures and Buildings Allowance rules to cover the whole of the UK.

The benefits if we can get this right to the UK are vast, likely to be in the hundreds of billions every year. Meeting demand for just one part of the UK's industrial infrastructure, logistics, could add £68bn in Gross Value Added to the UK economy - equivalent to 3% of UK economic output - and generate 1.1m jobs.

The UK faces significant challenges in its pathway to becoming a technological and scientific superpower by 2030. The most urgent is building the industrial infrastructure including the space, digital capabilities, utilities and transport networks that is able to provide the platform for the world-beating research institutions and businesses. This will enable the rest of our economy to adopt the rapid technological improvements made available to it.

This research is a call to action for policy makers to put in place the long term policies to grow our industrial infrastructure.

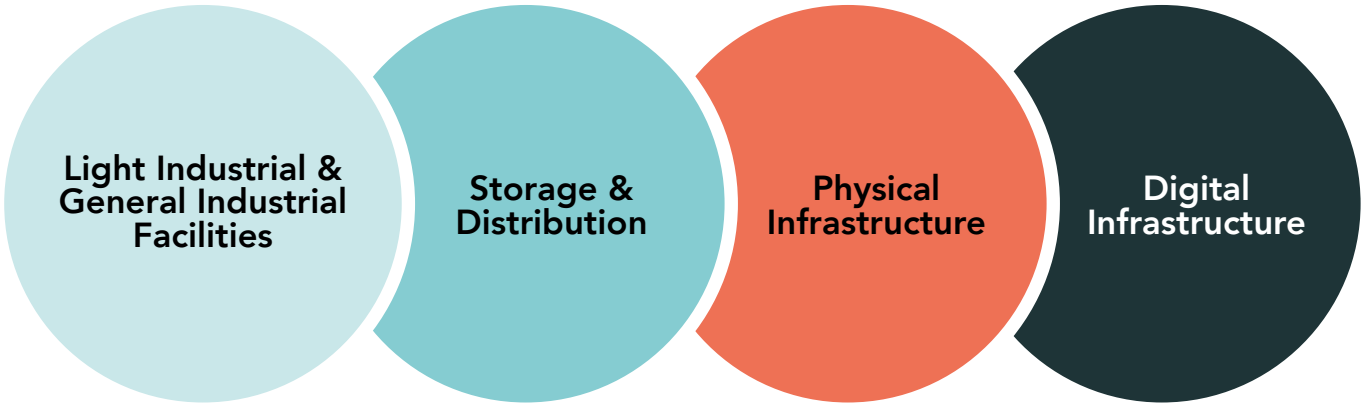
INTRODUCTION

AMBITION WITHOUT A CLEAR PLAN

The government has a vision to make Britain a science and technology superpower by 2030.[1] This means being a world leader in developing advanced technologies such as quantum tech, engineering biology, artificial intelligence (AI), semiconductors, and telecoms, as well as in their implementation and adoption by business.

The Government's Science and Technology Framework made clear that one of the ten pillars for achieving that vision is having the appropriate physical and digital infrastructure, a key part of what we refer to in this report as 'industrial infrastructure'. We define industrial infrastructure as the storage and distribution facilities, physical infrastructure (e.g. energy, water, road, rail and air) and digital infrastructure (e.g. broadband, 5G connectivity and data centres) that enable businesses, not-for-profit institutions and governments to carry out work to their full potential. These businesses and facilities are enablers for the rest of the economy to flourish either through hosting their businesses, distributing their products or providing essential goods (e.g. power).

FIGURE 1
INDUSTRIAL INFRASTRUCTURE



Although the Science and Technology Framework references the need for appropriate infrastructure, the detail on how the UK will develop a modern industrial infrastructure is not present. The Cyber-Physical Infrastructure review referred to in the Framework makes no reference to the facilities or infrastructure required for new technologies to be developed, or whether existing facilities are fit for emerging technologies.[2]

This is a worrying gap in the thinking of policy makers that this research hopes to correct.

1 Department for Science, Innovation and Technology, The UK Science and Technology Framework: taking a systems approach to UK science and technology, 6 March 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1140217/uk-science-technology-framework.pdf
2 The Robotics Growth Partnership, The Cyber-Physical Infrastructure, 11 February 2022, https://assets.publishing.service.gov.uk/media/6204e6ebe90e077f7392d446/cyber-physical-infrastructure-vision.pdf

OUR SUPERPOWER POTENTIAL IS LIMITED BY THE STATE OF OUR INDUSTRIAL INFRASTRUCTURE

While the government's vision is laudable, its current plans are not enough.

Too much focus is given to research and development (R&D) in isolation, as if this is alone to make the UK into a technological hub. As this report outlines, the lessons from history and the latest economic literature is that to put technology into action the UK needs world-class industrial infrastructure. We need a growing logistics sector that can efficiently store and transport goods, easy access to electricity to power manufacturing and automation, and available data centres to store data, internet servers and computers. At the same time this infrastructure will need to adopt new technology to make it effective and efficient.

On many fronts the UK is coming up short. The World Economic Forum's Global Competitiveness Report 2019, before the pandemic, found that the UK was ranked 36th in the world for the quality of our road infrastructure, 36th for the efficiency of our air transport, 31st for the efficiency of our railways and 46th for the quality of our electricity supply.[3] Unfortunately, there are no global statistics to compare the state of the UK's buildings and facilities, but there is no reason to believe that these are an exception to the UK's overall performance. 39% of the UK's non-residential buildings were built before 1970, for example, meaning we have one of the oldest building stocks in Europe.[4]

The UK's poor infrastructure is hampering both the development and adoption of new technologies. As we note in this report, the UK has low levels of R&D investment, low levels of robotic technology and is falling behind other countries for adoption of information technology. Research by Sage in 2022 about the challenges facing small and medium sized businesses in adopting new technology found that one in five businesses cited poor infrastructure as a contributing factor.[5] The same research found that unlocking the full benefits of technology within these firms could add an extra £232bn a year to the economic contribution of SMEs.[6]

BOTTLENECKS AND BUREAUCRACY

Our research - including workshops and interviews - suggests a cluster of barriers are creating problems for industrial infrastructure. The electricity grid lacks capacity and leaves businesses with huge uncertainty in their planning. Planning systems are inconsistent and without enough concern for infrastructural development. There are gaps in our workforce and a lack of awareness of career opportunities in key aspects of our industrial infrastructure, such as logistics. Levels of public and private investment are too low. And there is not enough connection between different players in the sector, and between the sector and policy decision-makers.

Unlocking these issues would breathe new life into our industrial infrastructure. In turn, it would enable businesses across the UK to plan their technological development better, develop at lower costs, and attract more investment to drive that forward. The logistics and storage, electricity, and data centre industries will also benefit from that technological boost, feeding back into the wider economy once again.

OUR RESEARCH METHODOLOGY

To evaluate these problems and identify the solutions, we conducted a comprehensive review of relevant literature. We then ran a series of policy workshops and expert interviews with small, medium, and large infrastructural businesses - spanning manufacturers, food producers, media, logistics, storage, and data centres. This provided us with an in-depth view of the barriers businesses face when using or delivering industrial infrastructure, and business perspectives on how to solve them. To check whether these experiences hold up more broadly, we ran a survey of 500 businesses - including 100 science and technology businesses - on the same themes.

3 Shwab K, The Global Competitiveness Report 2019, World Economic Forum, 8 October 2019, https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

4 RICS, Time to Retrofit: Decarbonising UK buildings and economic recovery, 18 November 2020, https://www.rics.org/news-insights/time-to-retrofit-decarbonising-uk-buildings-and-economic-recovery

5 Sage, Digital Britain: How small businesses are turning the tide on tech, 25 June 2022, https://www.sage.com/en-gb/company/digital-newsroom/2022/06/25/digital-britain/

6 Ibid.

REPORT STRUCTURE

- **Section one** of this report shows the critical role that industrial infrastructure plays in improving our productivity, technological adoption and long term growth. If the UK wants to be a technological superpower, it needs to put industrial infrastructure at the core of the strategy.
- **Section two** outlines the mixed experience of businesses through our survey, workshop and interviews with businesses. We find that hundreds of thousands of businesses are being negatively affected by the lack of access to the industrial infrastructure they need.
- **Section three** outlines the barriers to strengthening industrial infrastructure, in particular regarding problems with power supply, buildings, the planning system, transport, skills and partnership with government.
- **Section four** outlines six policies that would help to significantly improve our industrial infrastructure.
- **Section five** outlines some of the economic benefits the UK can generate through getting this right.

The government needs to put industrial infrastructure at the centre of its growth strategy. The bold proposals in this report would mark a sea change in the government's approach and send a clear signal to businesses that we want to build more, upgrade our existing infrastructure and give our country the best platform for growth possible.

1. POWERING THE SUPERPOWER
THE CRITICAL ROLE OF INDUSTRIAL INFRASTRUCTURE

POOR TECHNOLOGICAL ADOPTION IS HOLDING BACK OUR PRODUCTIVITY AND GROWTH

The United Kingdom remains one of the largest and most sophisticated economies in the world. According to the World Bank the United Kingdom is the sixth largest economy, with the 4th highest GDP per capita of the G7 of developed democratic economies.[7,8] The UK has attained this through being at the forefront of the invention, development and adoption of new technologies.

Over the long run the most effective way to grow the economy, create jobs with higher wages and raise living standards is to increase productivity. There are three main components of how we measure productivity: capital, labour and a residual - often termed multifactor productivity (MFP). MFP captures drivers of productivity beyond increasing labour and capital inputs, like technological progress, better management and more efficient ways of combining other inputs.

We can increase labour productivity through improving skills and utilising people's time and effort effectively. We can increase capital productivity by investing in new and better facilities - which we address directly in this report. Both of these are important. But MFP is particularly important for those economies that want to be global leaders, as countries with higher levels of MFP are usually richer than their peers. This is because sustained MFP growth is particularly hard to achieve, as economies with high MFP tend to be those that are better at innovating and adopting new technologies to produce more for less input.[9]

Unfortunately for the UK, we are lagging behind our competitors in Europe and America for technological adoptions as Chart 1 shows. The Mckinsey Digital Survey in 2018 found that just 30% of the UK businesses it interviewed were using big data (analysis of large data sets), compared to 36% of those in Europe and 38% of those in the US. We similarly lag behind on smart robotics (AI trained robots), and use of AI tools (softwares like chatGPT). On machine-learning algorithms (like social media algorithms), UK businesses are more middle of the pack. The exception is quantum technology, which is at a very early stage of development.[10] For this, 26% of UK companies are working with or planning to work with this, compared to 22% in the US, 26% in Germany, and 23% in France.

7 World Bank, GDP (current US$), accessed 10 November 2023, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?most_recent_value_desc=true

8 World Bank, GDP per capita (current US$), accessed 10 November 2023, https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?most_recent_value_desc=true

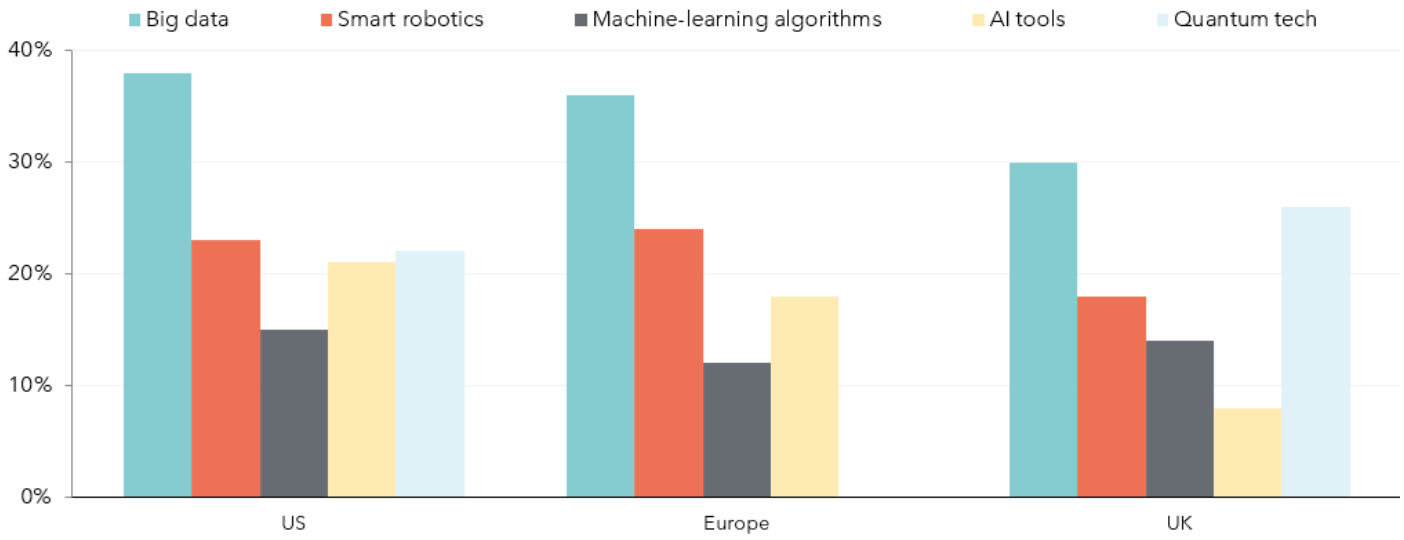
9 Crafts N, What creates multi-factor productivity, University of Warwick, January 2008, https://wrap.warwick.ac.uk/44678/

10 Alsop T, Share of organizations working or planning to work with quantum technologies in 2021, by country, Statista, 17 April 2023, https://www.statista.com/statistics/1319076/quantum-technology-adoption-country/

CHART 1

UK businesses lag behind Europe and America's in adopting most forms of modern tech

Share of companies adopting tech



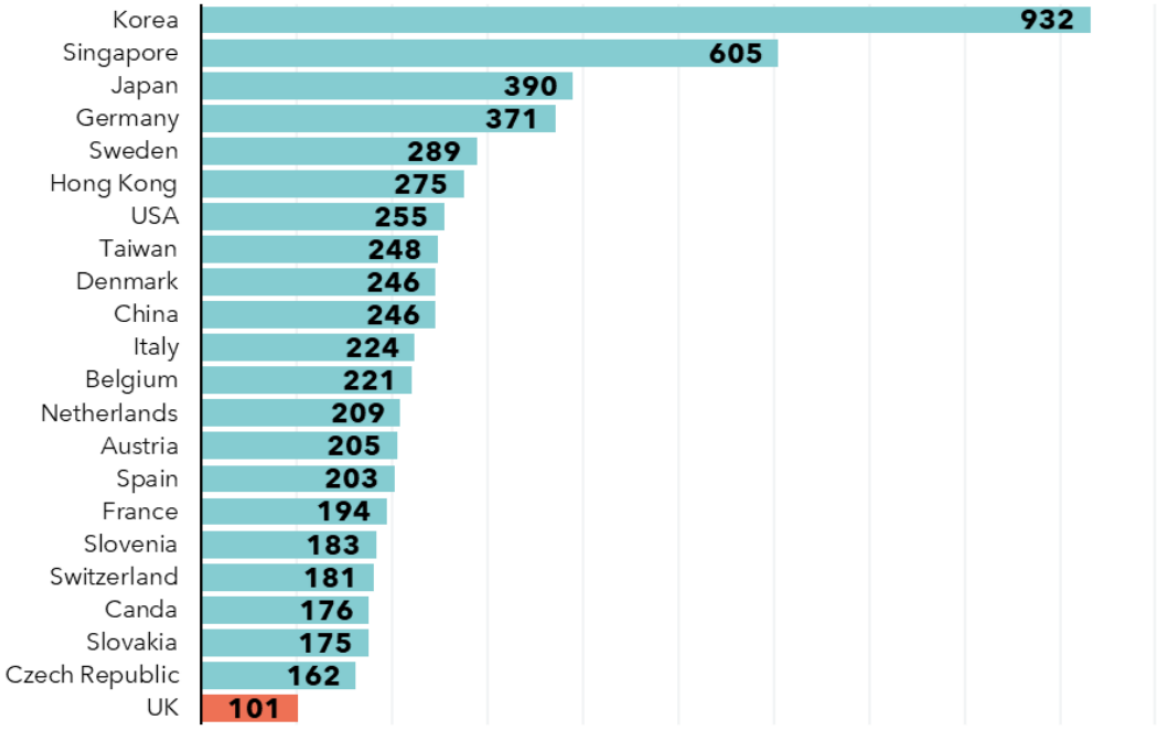
Source: Mckinsey Global Institute, Artificial intelligence in the United Kingdom: Prospects and challenges, June 2019, https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Artificial%20Intelligence/Artificial%20intelligence%20in%20the%20United%20Kingdom%20Prospects%20and%20challenges/Artificial-intelligence-in-the-United-Kingdom-VF2.ashx

The UK has created a Robotics Growth Partnership, yet remains one of the worst adopters of robotics in the developed world. The UK deploys just one robot for every ten workers, compared to two robots for every ten workers in France and the United States and nearly four robots for every ten workers in Japan and Germany.[11]

CHART 2

The UK uses far less robots than its peer countries[11]

Robots per 1,000 workers



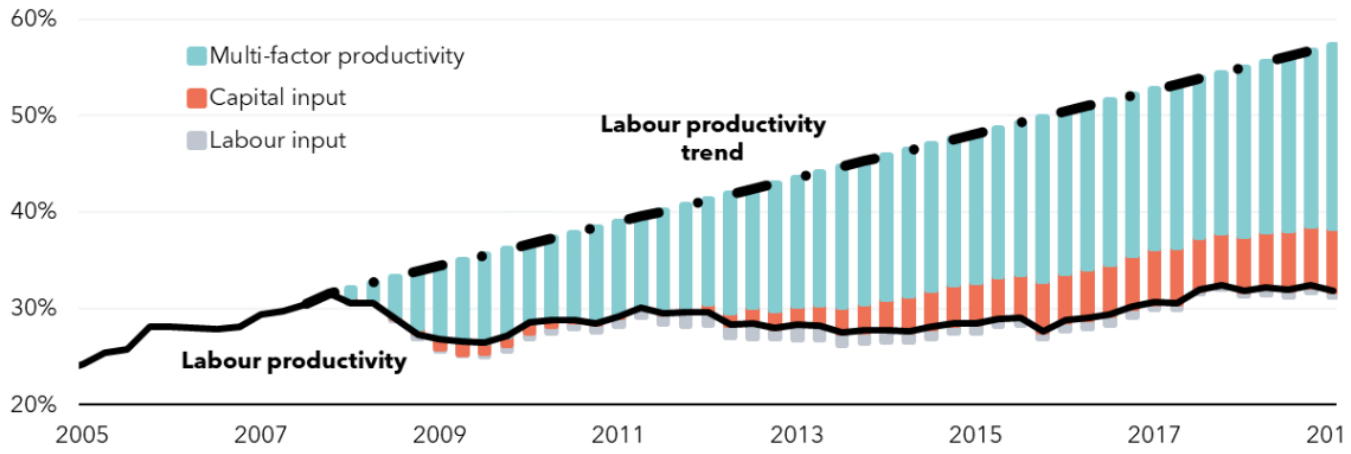
11 Balloon, *Robot density in the UK in 2022: Is automation the key to boosting productivity?*, June 2022, https://balloonone.com/blog/2022/05/04/robot-density-in-the-uk-in-2022/

All this has contributed to the UK's overall slowdown in productivity. As Chart 3 shows, MFP has been *the* drag on the UK's output growth (productivity) and therefore its overall economic performance. In essence, whilst UK workers have been upskilling themselves and working harder, and whilst companies have been investing more into their businesses, our lack of effective deployment of new technologies has been holding us back. Unless we are able to correct this, not only will the UK fail to be a science and technological superpower, we will slip further behind as a global economic player.

CHART 3

Multi-factor productivity has been the main driver of the UK productivity gap since 2008

Percentage increase in productivity (output per hour worked) on 1994 levels, with breakdown of productivity gap by component



Source: ONS, Productivity economic commentary: January to March 2019, 5 July 2019, https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/ukproductivityintroduction/januarytomarch2019

The answer, however, is not to focus on *inventing* more but on the deployment of technology. Technological superpowers are, as a recent Onward report noted, those countries which can deploy and export their technologies overseas rather than merely having good ideas.[12] In this regard, industrial infrastructure holds the key, for it is the physical constraint that limits the UK's ability to boost productivity.

THE ROLE OF INDUSTRIAL INFRASTRUCTURE IN ENABLING TECHNOLOGICAL TRANSITION

Despite calls from the government for businesses to invest more in new technology, our track record has been poor.[13] Other reports have highlighted the lack of patient capital or a lack of understanding amongst businesses of new technologies.[14,15,16]

This report takes a different approach. We focus on the challenges of integrating new technology and investment into businesses due to a lack of appropriate facilities. We believe that this could be the most significant practical barrier to the UK becoming a technological superpower. The physical world is still (and will be for the foreseeable future) a constraint on digital (and all) technologies.

12 Burnett M and Priestley M, Rocket Science: How can the UK become a science superpower?, Onward, 4 August 2022, https://www.ukonward.com/reports/rocket-science/

13 Landi M, 'UK must 'embrace new technologies' to grow economy, Chancellor says', The Independent, 13 June 2022, https://www.independent.co.uk/news/uk/rishi-sunak-chancellor-nadine-dorries-gdp-government-b2099597.html

14 Harford T, 'Why didn't electricity immediately change manufacturing?', BBC, 21 August 2017, https://www.bbc.co.uk/news/business-40673694

15 HM Treasury and Department for Business, Energy & Industrial Strategy, Patient Capital Review, 23 January 2017, https://assets.publishing.service.gov.uk/media/5a82f16b40f0b62305b95264/PCR_Industry_panel_response.pdf

16 BT, The Future in 2020 Review, 3 November 2020, https://business.bt.com/content/dam/bt/business/v2/PDF/campaigns/BT_The_Future_In_2020.pdf

Historically, industrial infrastructure has played a critical role in enabling technological transitions. The link between infrastructure and technology has been clear since Boulton and Watt built the Soho Foundry in the late 18th Century, creating the world's first modern industrial facility.

One of the reasons for the well documented 'lag' between technological innovations (such as the development of steam power or electricity) and later adoption in the economy was the lack of appropriate industrial facilities and associated infrastructure. Steam-power required access to huge quantities of energy and floor spaces that could be built around huge belt shafts that could power multiple machines, hence the need to build the Soho Foundry. However, the investment and sunk costs in this infrastructure took significant time to have an effect. Moreover, once businesses had spent decades investing in facilities for steam power, they were reluctant to maximise the potential of electric power because of the cost and effort in changing required to existing facilities.[17] As economic historian Paul David noted, the deadhand of steam-based facilities constrained the deployment of electric power for decades. It took nearly forty years before industrial infrastructure had been transformed to make the United States fit for electricity.[18]

David's argument was that the same challenges would act as a drag on information technology, as businesses were dominated by facilities built for the analogue world. We are still living in David's world. Businesses regularly report challenges in getting access to decent internet signals. Anyone taking a train journey will be acutely aware of the frustrations of intermittent connections. This is because the infrastructure we are using was not designed with digital transformation in mind. In those sectors that have been at the forefront of the deployment of informational technology (particularly finance), their industrial infrastructure has been transformed. Low-level granite-hewn buildings have been torn down in favour of tall, glass and steel structures that enable for easy digital connection and enable teams and functions to be rapidly moved from one place to another. It would be impossible for firms operating on the technological frontier to have made the full use of these changes without changing the facilities in which they are operating in or without the accompanying physical and digital infrastructure.

More recently, we saw the importance of industrial infrastructure as we battled with the COVID-19 pandemic. The UK is an acknowledged world leader in life sciences, but we initially lacked the manufacture and distribution facilities to turn this research into jabs. Our supply chain was tested to the limit as demand for PPR, medicines, food and essential household products increased exponentially. However, through a national effort, the necessary infrastructure was developed, but the limitations on the UK's ability to make the most of its technological advantage were apparent.

Moreover, the physical ability to turn ideas into products that can be traded both domestically and around the world is critical to realising the benefits of technological progress. Worryingly, productivity in UK manufacturing has stagnated since 2010.[19] The ability of our manufacturers to integrate and exploit technological developments - and boost its productivity - will depend on access to industrial infrastructure. In the 2017 report, *Age of Automation - Artificial Intelligence, robotics and the future of low-skilled work*, the RSA also found that physical constraints were having a negative impact on our ability to integrate new technologies into our economy.[20]

LOW INVESTMENT IN INDUSTRIAL INFRASTRUCTURE IS UNDERMINING OUR TECHNOLOGICAL TRANSITION

In order to make the most of new technologies and boost productivity, the UK needs to focus as much on investment in industrial infrastructure as it does investment in R&D, which has been subject to a government target.

The UK's overall levels of private investment in capital (e.g. plant, machinery, equipment etc.) has been stagnant since 2015. Where that investment has been made has also been extremely unbalanced. As Chart 4 shows, the vast majority of growth in our industrial infrastructure has come from energy generation, including

17 Devine W, 'From Shafts to Wires: Historical Perspective on Electrification', The Journal of Economic History, 1983, https://www.jstor.org/stable/2120827

18 David P, The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox, May 1990, http://digamo.free.fr/david90.pdf

19 Allas T et al, Facing the future: Britain's new industrial revolution, McKinsey, 27 may 2021, https://www.mckinsey.com/capabilities/operations/our-insights/facing-the-future-britains-new-industrial-revolution

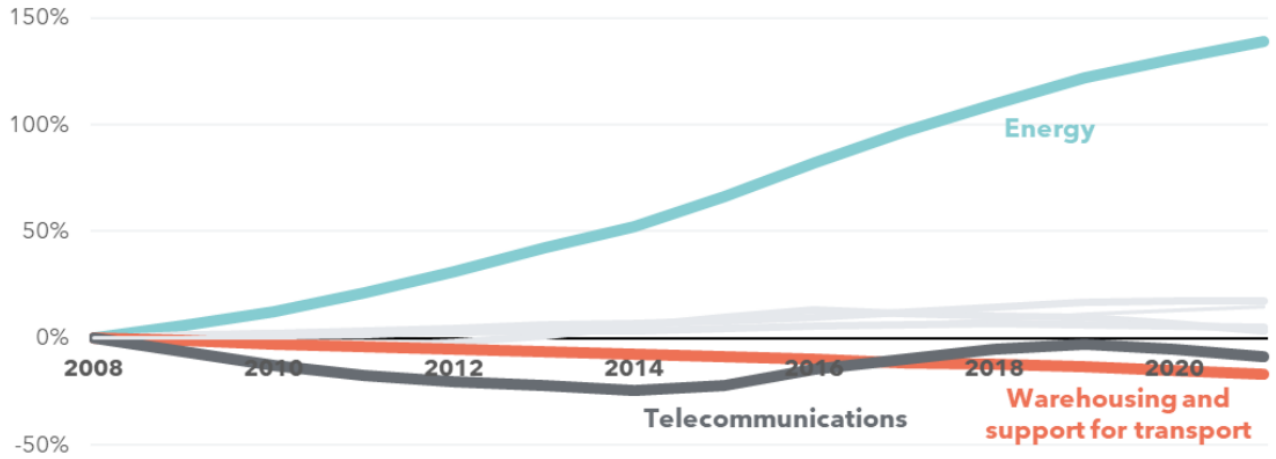
20 Dallot B and Wallace-Stephens F, The Age of Automation Artificial intelligence, robotics and the future of low-skilled work, RSA, September 2017, https://www.thersa.org/globalassets/pdfs/reports/rsa_the-age-of-automation-report.pdf

renewables. Although this is important, particularly as we seek to electrify transportation and increase our computing power - which requires significant amounts of energy - it is not the only area where we need investment. Sectors such as transportation and warehousing (industrial space) and telecommunications have seen the overall stock of infrastructure *fall* since the financial crisis in 2008, inhibiting our ability to take up new technologies. This means that every year, we have *less* of the infrastructure that we need in key sectors.

CHART 4

Private investment in logistics and telecomms infrastructure has fallen since 2008, while investment in energy has grown rapidly

Change in market sector net stocks of infrastructure, by industrial classification



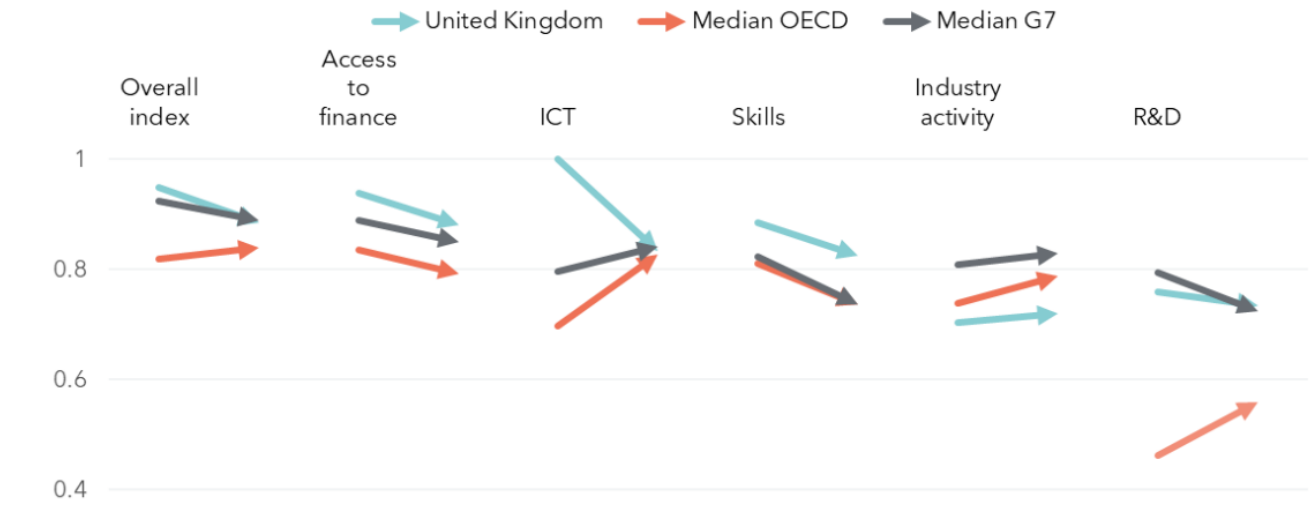
Source: ONS, Infrastructure in the UK, investment and net stocks: May 2023, 17 May 20213, https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/developingnewmeasuresofinfrastructureinvestment/may2023

This has directly affected the UK's readiness for advanced technology. The United Nations Conference on Trade and Development (UNCTAD) has found that over the same period, the UK's overall readiness for frontier technologies has reduced. In particular, the UK ranks poorly for industrial activity, where it is far below its G7 competitors. This contrasts with access to finance and skills, where the UK is outperforming other major economies.

CHART 5

The UK's readiness for advanced tech has fallen since 2008 across all domains other than industry activity

Change in UNCTAD rating of frontier technology readiness, 2008-21, by component



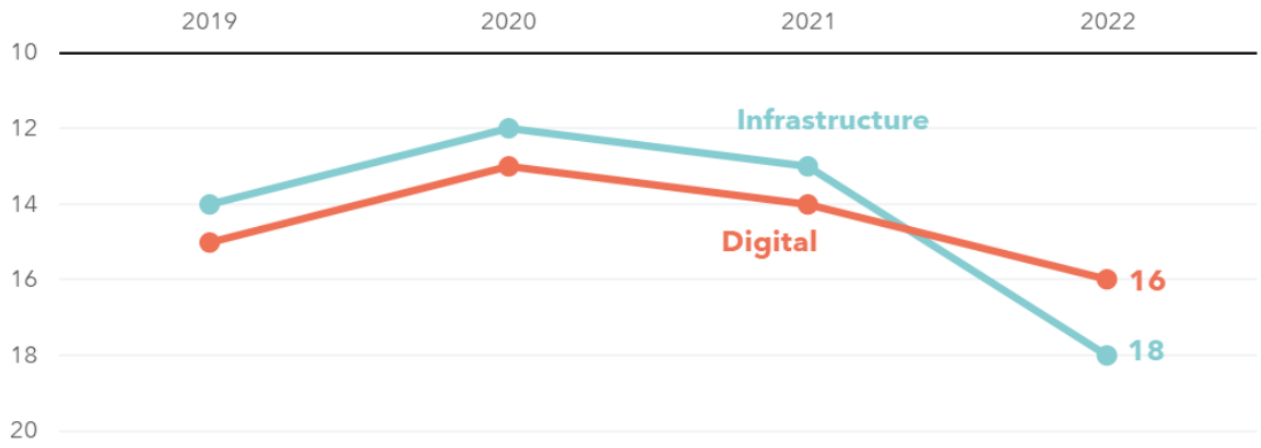
Source: UNCTAD, Frontier Technology Readiness Index, 5 October 2023, https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI

Unsurprisingly, as the UK's infrastructure has deteriorated and our ability to adopt new technologies, so too has our global competitiveness including in technology. According to the International Institute for Management Development (IMD), the UK has fallen from 14th to 18th in terms of the quality of its infrastructure. This in turn has started to drag down on its rankings for digital competitiveness. For example, the UK ranks well for innovation in terms of R&D, but poorly for capital investment in technology and infrastructure.

CHART 6

As the UK's rank for infrastructure competitiveness has fallen, so has it's rank for digital competitiveness

UK international rank for infrastructure and digital competitiveness, World Competitiveness Index



Source: IMD, World Digital Competitiveness Ranking, 22 December 2022, https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-digital-competitiveness-ranking/ and IMD, World Competitiveness Ranking, June 2023, https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-competitiveness-ranking/2023/

Many speeches have been devoted to the potential threats from the emerging technological revolution. Instead of worrying about disruptions to the world of work and our economy, we should be more worried that we will see limited adoption of new technologies in the UK due to our fragile industrial infrastructure.

2. NOT SO SUPER
THE EXPERIENCE OF BUSINESS

The UK has aspirations to be a global technology superpower, but our research has found that the experience of business is mixed.

To get the perspective of businesses and better understand how the lack of industrial infrastructure affected them, we surveyed 504 businesses (micro, small, medium and large) to understand the challenges that they face. As part of that sample we surveyed 97 businesses working in science and technology to understand the challenges facing those working in sectors at the economic frontier.

We also held a workshop with ten large businesses, working with our partner SEGRO, and six one-to-one interviews with businesses. Those we engaged with were all technology-led businesses that operated out of industrial facilities and worked in a variety of sectors such as retail, logistics, data centres and construction providing a broad range of perspectives. We illuminate some of the challenges facing businesses through 'business insight' case studies throughout this section.

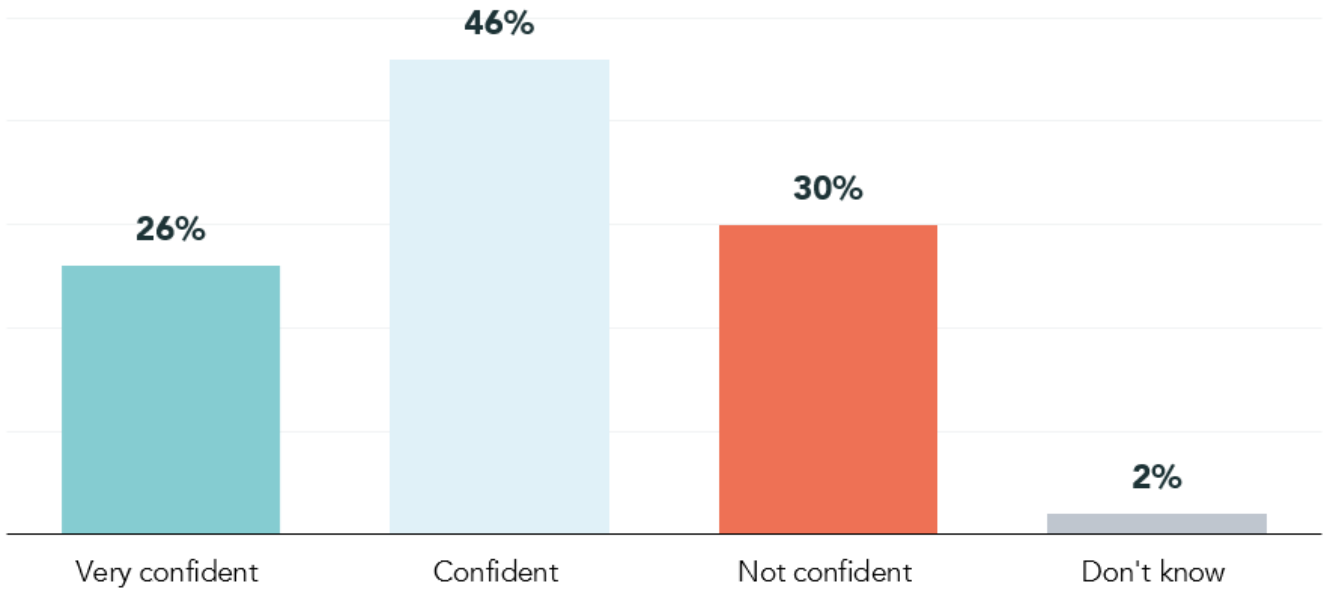
AROUND A THIRD OF BUSINESSES ARE NOT CONFIDENT IN THE UK AS AN ATTRACTIVE PLACE TO DO BUSINESS

The UK has strong attributes as an economy, with the majority of businesses being confident about its attractiveness as a place to do business over the next decade. However, our survey found that a significant minority (30%) are not confident about the UK's ability to remain an attractive destination for business. Smaller businesses (fewer than 25 employees) were less likely to be confident in the country's future attractiveness to do business, with 42% saying they were not confident compared to just 28% of large businesses (more than 500 employees). This chimed with the views expressed in our workshop and interviews, as businesses were optimistic about the potential of the UK economy but concerned about the challenges of poor access to necessary industrial infrastructure.

CHART 7

Three in ten businesses are not confident the UK will be an attractive place to do business in coming years

Question: How confident are you that the UK economy will be an attractive place to do business in the next decade?



Source: Demos/FocalData Survey

BUSINESS INSIGHT #1
EQUINIX AND DATA CENTRES

Equinix is one of the world's largest data center providers, with around 250 data centers across 31 countries. They employ over 1,000 people in the UK across 15 different UK locations.[21] By 2022, Equinix had invested over £1 billion in UK digital infrastructure.[22]

However in expanding in the UK, Equinix has faced barriers within poor access to power, slow planning processes, and regulatory inefficiencies. Prolonged uncertainty on timescales, both in power and planning, impacts Equinix's wider capacity planning. On top of this, the inefficiencies in planning mean a planning consultant is employed on almost every project Equinix delivers, not just to provide planning strategy advice, but also to manage and chase decisions from the planning office.

Low power availability and delays to connection can also impact the type of business growth, as Equinix chooses between hyperscale data centers (for big data-producing companies - the likes of Google or Microsoft) or data centers for retailers.

POWER

For Equinix, power is typically the critical path for data center delivery. Yet, queues for access to power can be between 5 and 10 years for a typical data center, or 10 to 15+ years for a larger 'campus' of data centers.

Wait times are very location specific. Equinix's site selection is significantly shaped by the availability of power and the confidence in a utility provider to be able to deliver power on time. However, it is very difficult to get clarity from utility companies on delivery timelines, creating significant issues for planning.

The large scale power connections that data centers need also require large scale infrastructure upgrades or enhancements. However, Equinix's experience is that infrastructure investment has not kept up with demand. The upgrades required to support large scale customers are only put in place on a customer by customer basis, and do not appear to be based on forward planning. Given this, the company finds that delivery dates can slip, often by years, complicating investment decisions and project planning.

21 Best companies, 'Equinix', accessed 20 November 2022, https://www.b.co.uk/companies/equinix
22 Equinix, UK's Digital Infrastructure Boosted by £179M to Meet Evolving Business and Consumer Needs, 23 November 2022, https://www.equinix.co.uk/newsroom/press-releases/2022/11/uk-s-digital-infrastructure-boosted-by-179m-to-meet-evolving-business-and-consumer-needs

PLANNING

After gaining access to power, planning processes are the critical path for delivery for data centers. Yet, planning processes can take between 12 and 18+ months, with pre-applications often taking 12 months alone.

Equinix has used planning performance agreements in this process - project management tools administered by local authorities to agree actions and timelines with applicants.[23] They found that these provided a greater level of certainty in terms of scale when going into applications for large developments. However, the business has not experienced significantly improved timelines - the core problem remains with under-resourced planning offices unable to keep up with the volume of work.

For Simplified Planning Zones - an area identified by a local planning authority for specific development - Equinix experiences a smoother planning process, given that the requirements are clearer.

REGULATION

Equinix faces an increasing level of reporting requirements (both in the EU and UK). They face the risk that an overlapping patchwork of regulations requires the same information in many different formats. On top of this, some of the regulatory requirements are subject to local council interpretation and decisions, meaning it is hard to plan at scale.

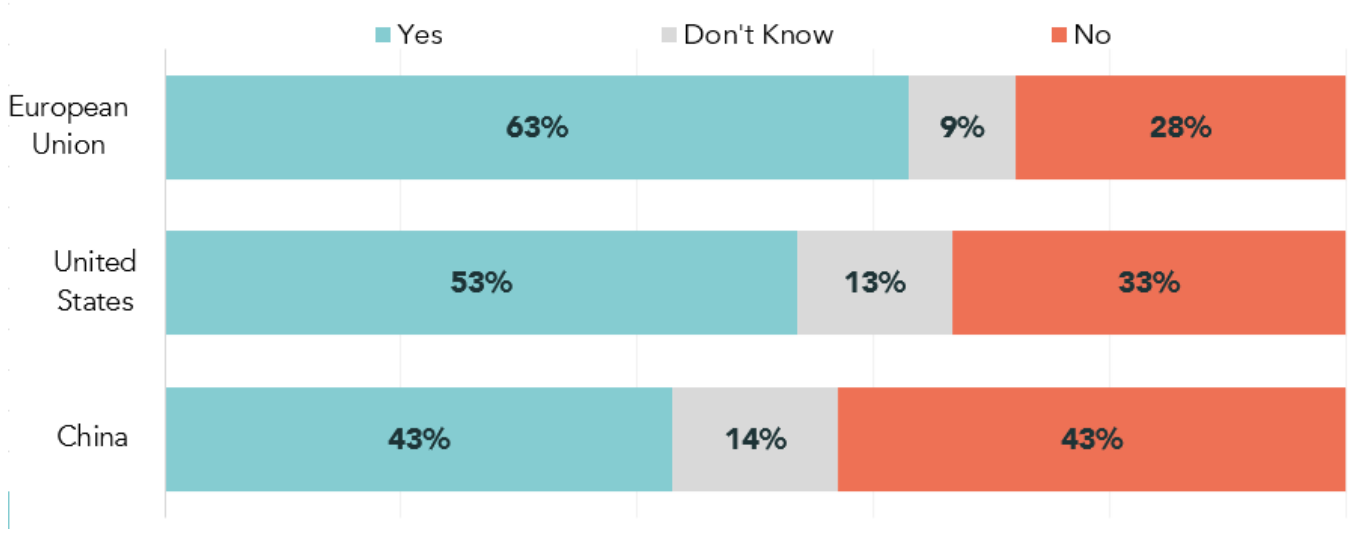
23 Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, Before submitting an application, 6 March 2014, https://www.gov.uk/guidance/before-submitting-an-application

In regard to concerns about international competition, businesses are most concerned about the challenge from China over the next decade, and less concerned about that from the European Union. Both the United States and China have seen significant investments in their infrastructure, with both countries launching major industrial infrastructure plans worth over $1 trillion dollars in the past year - which is likely to be a factor in businesses' concerns about their competitiveness.[24,25] In the United States, the Biden Administration has invested in a range of projects from harbour redevelopment in Virginia to new hydroelectric power projects in Maryland. The focus has been on developing the core industrial infrastructure of the US to compete effectively with the emerging economies in Asia. In China, the Belt and Road Initiative has also focused on expanding its core industrial infrastructure from expanding harbours for container shipping to creating new highways for road and rail freight. This has been a global initiative, expanding facilities in nations where China expects to trade in the future further strengthen its global market share.

CHART 8

People think the UK will be competitive with the US and EU, but are split about whether we'll be competitive with China

Question: Do you think that the UK economy will be competitive with...as a place to do business over the next decade?



Source: Demos/FocalData Survey

24 Hancock T, These Are the Megaprojects in China's $1 Trillion Infrastructure Plan, Bloomberg, 25 August 2022, https://www.bloomberg.com/news/features/2022-08-25/how-china-will-spend-1-trillion-on-infrastructure-to-boost-economy

25 The White House, Fact Sheet: The Bipartisan Infrastructure Deal, 6 November 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/

BUSINESS INSIGHT #2
DHL AND LOGISTICS

DHL Group is a leading global logistics company The Group connects people and markets and is an enabler of global trade. In the UK DHL operates across more than 450 sites, employing more than 50,000 people with over 11,000 vehicles, including hundreds of electric vehicles (EVs).[26]

DHL is facing barriers to its UK business as a result of poor infrastructure for EVs and access to power, lack of airport capacity for cargo and limited recognition of the economic value of freight in the policy making process. When logistics is not factored into policy decisions it can lead to a fragmented regulatory framework. For a national business, operating within a fragmented framework can lead to inefficiencies and additional cost when transporting goods.

GOVERNMENT RECOGNITION OF THE ECONOMIC VALUE OF FREIGHT

The logistics and freight industry has grown rapidly in recent years and supports almost all parts of the UK economy. Despite this, there is little recognition of the role of logistics or in depth understanding of how logistics businesses operate by policy makers. Currently the economic value of freight for the UK is based on the direct impacts of delay time, primarily relating to the cost of a driver's wage for delays. However, this doesn't account for many broader impacts. If a driver is carrying time-sensitive materials, for example - those that either degrade or are necessary to restart a production line - delays in freight will cause various knock-on costs that are currently missed within the government's calculations.

This means logistics businesses rarely get an approach from local authorities to ask about the impact of planning decisions on freight. Instead, in DHL's experience, policy approaches are tweaked around the edges to adjust to the logistics industry.

26 DHL eCommerce UK, 'About', LinkedIn, accessed 20 November 2022, https://www.linkedin.com/company/dhl-parcel-uk/?originalSubdomain=uk

EV CHARGING INFRASTRUCTURE AND ACCESS TO POWER

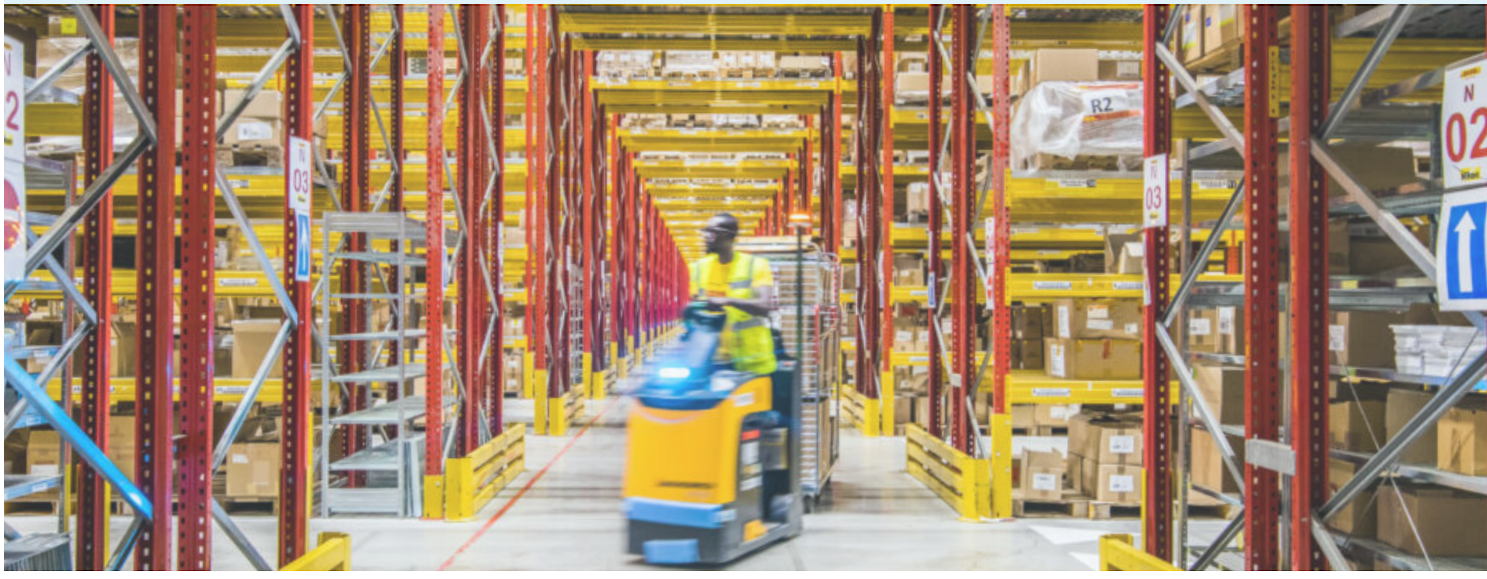
Globally DHL Group has committed to stretching targets to reduce its carbon emissions. In the UK DHL is working to electrify its last mile delivery fleet with the roll out of electric vans as well as investing in electric trucks where available. While electric vehicle (EV) charging infrastructure is expanding in the UK, it does not adequately account for large logistics sites. To meet the needs of DHL, with multiple vehicles requiring charging at the same time, new electricity infrastructure is required as well as grid upgrades. An equitable way of sharing the costs of upgrading the grid on logistics sites is necessary to ensure the infrastructure keeps pace with the technology businesses are investing in.

In addition public charging infrastructure does not account for vans or heavy vehicles. DHL finds that charging bays are often limited to the size of cars, and so are inaccessible for their vans, while larger vehicles are required to return to sites to charge. It is essential that the needs of logistics organisations is factored into national and local plans to roll out EV charging infrastructure to ensure that public charging infrastructure provides rapid charging as well as secure locations of adequate size.

AIRPORT CAPACITY

Airport capacity in the UK is limited for all-cargo operators. A combination of local and national rules is making operating from UK airports, particularly in the South East, increasingly difficult. DHL operates a global fleet of dedicated freighters as well as moving goods in the bellyhold of passenger planes. For our Express operations night flying is an operational necessity to deliver a time definite product for our customers. While the need to balance the environmental impacts including noise of air operations is recognised, the economic value of express air freight must be taken into account in decision making about airport capacity and expansion, in order to facilitate global trade.

As an island nation airport capacity is critical to get goods into and out of the UK. But air freight should not be considered in isolation. For example goods moving into the UK by air and by sea are sorted and then moved by road within the UK to their destination. Policy makers too often make modally based decisions without considering the integrated nature of the movement of goods. DHL Express for example operate a fully integrated road and air network. When road connections to the continent are closed unexpectedly, there should be a contingency within the UK freight network to accept goods moved by another mode, such as air uplift. In order to facilitate this, local and/or national airport restrictions need to be lifted to permit time-limited ad hoc air movements until the disruption has ended. Policy makers must consider the needs of the entire freight network rather than just the transport mode and associated infrastructure.

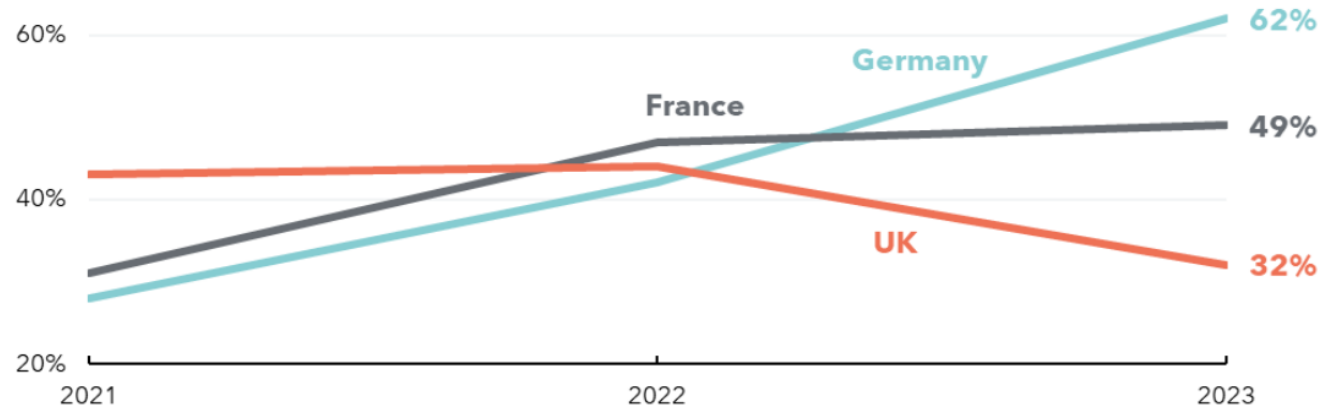


It also seems that concerns about the UK's competitiveness have grown over time. An annual survey by EY, a consultancy, found that while in 2020 44% of foreign investors they served saw the UK as a top three European country to invest in, in 2023 this dropped to just 32%. At the same time, the proportion citing France or Germany as a top attractive place to invest increased year-on-year. Accordingly, while in 2021, the UK came ahead of both France and Germany on this measure, by 2023 it was behind both countries.

CHART 9

Fewer investors see the UK as an attractive place to do business in 2023 than in previous years

Question: Which European countries do you believe will be the most attractive for foreign investment in 2023? (Three choices)

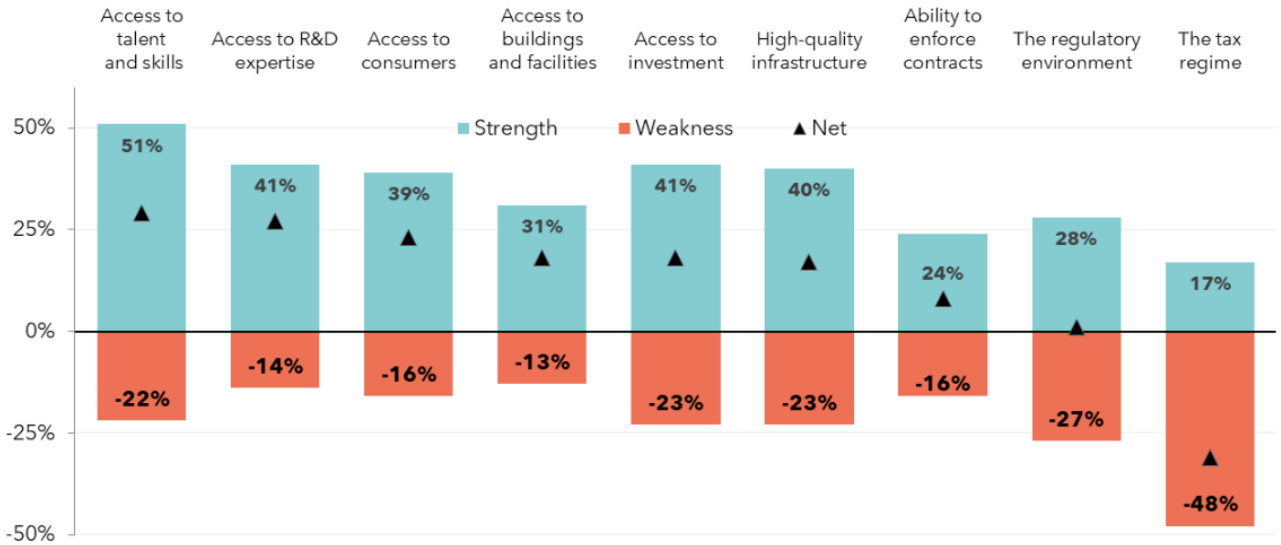


In looking at what drives these issues, we asked businesses what they considered to be the biggest strengths and weaknesses facing the UK economy. The tax regime had the lowest "net" score, with -38% considering it a weakness and only 17% considering it to be a strength. The regulatory environment and ability to enforce contracts also scored poorly. Access to high quality infrastructure was the 4th lowest ranked, with a net score of 17%, with access to buildings and facilities just slightly higher at 18%. By comparison, access to talent and skills and R&D expertise - often the focus on policy makers when it comes to science and technology policy - were ranked higher, at 29% and 27% net scores respectively.

CHART 10

People think the biggest strengths of the UK economy are access to talent and expertise, with the biggest weakness around the tax regime

Question: What do you think are the biggest strengths/weaknesses of the UK economy as a place to do business?



Source: Demos/FocalData Survey

OVER 350,000 BUSINESSES LACK ACCESS TO THE FACILITIES AND BUILDINGS THEY NEED TO SUCCEED

Of those surveyed, 15% of businesses said that they did not have access to the buildings and facilities they needed - a significant minority. Based on this, we estimate that up to 4,809 major employers (those with more than 250 employees) are without access to the buildings and facilities they want. These businesses are estimated to have a combined turnover of £373bn a year and together employ around 1.85m people.[27] They are also likely to be the biggest determinants of the country's levels of investment and productivity growth in future years.

Overall, the portions of businesses affected are significant. In total, we estimate that over 350,000 businesses, employing 3.8m people with a combined turnover of £666bn a year could be affected by a lack of access to the right buildings and facilities. Businesses will be affected in a variety of capacities, from lacking the space to grow and hire new staff or install new equipment to working with facilities that lack the power requirements to upgrade their vehicle fleets. Although this is a minority of the UK's business population, at a time when the economy is struggling to generate sustained levels of economic growth, policy makers cannot afford to ignore this problem.

TABLE 1
POPULATION OF BUSINESSES AFFECTED BY A LACK OF ACCESS TO BUSINESS FACILITIES

SIZE OF BUSINESS	NUMBER OF BUSINESSES AFFECTED	NUMBER OF EMPLOYEES AFFECTED	TURNOVER OF BUSINESSES AFFECTED
Micro	302,146	1,100,000	£152bn
Small	46,784	912,000	£141bn
*Medium**	*3,690*	*359,000*	*£76bn*
Large	1,114	1,500,000	£297bn
TOTAL	**353,734**	**3,871,000**	**£666bn**

** Sample less than 100 businesses*

Those businesses that said they were affected by the lack of access to facilities and buildings reported that this would have a significant impact on their future plans. 69% of respondents that lacked access to suitable buildings and facilities said that it would have a very significant or significant impact on their future plans. Impacts reported by respondents included:

- Reduction of operational performance - 45%
- Reduction in the ability to compete with other businesses in the UK and overseas - 39%
- Reducing plans for investment in new equipment or replacing existing equipment - 37%
- Reducing the number of staff hired - 27%
- Reducing training for existing staff - 24%
- Reducing plans for growth in future years - 20%

27 Considering the average turnover, employees from each category of businesses based on BAT business population statistics and comparing them to respondents of our survey that said "no" to whether they had access to suitable buildings and facilities for their businesses to succeed. Department for Business and Trade, Business population estimates for the UK and regions 2023: statistical release, 5 October 2023, https://www.gov.uk/government/statistics/business-population-estimates-2023/business-population-estimates-for-the-uk-and-regions-2023-statistical-release

A majority of respondents who said that they did not have access to suitable buildings and facilities also reported that, if they did receive access, they would increase their plans for growth in future years, boosting investment and job creation. This suggests that tackling the lack of appropriate buildings and facilities would unlock business growth.

Similar proportions of businesses reported that lack of access to necessary physical infrastructure (12%) and adequate digital infrastructure (12%) were barriers to their business. Again, a majority of the businesses within our survey that did not have access to the right physical or digital infrastructure reported that it significantly affected their future growth plans (65% and 66% respectively).

The impact of the lack of industrial infrastructure is not simply a theoretical concern, but one that is directly translating to the decisions that businesses are making about jobs, investment and deployment of new technologies.

BUSINESSES WANT MORE ACTION FROM UK GOVERNMENT

> *[Logistics] is a very multifaceted industry, and not a sexy industry - so it's hard to build a cohesive story. Yet, we employ 50,000 people - that should always get a seat at the government table.*
> - Business workshop participant

> *An understanding of what we do is needed - across government, central and local. We want input from informed stakeholders in government. There is a systemic problem of not understanding what we do. They need to know, if they pull this lever, X will be the cause on the industry.*
> - Business workshop participant

> *We have no home in government. If you discuss something with government, you're pushed to DfT, but they just regulate the industry. If you have an issue on food or drink, they push you to Defra, and for trade they push to trade people in HMRC.*
> - Business workshop participant

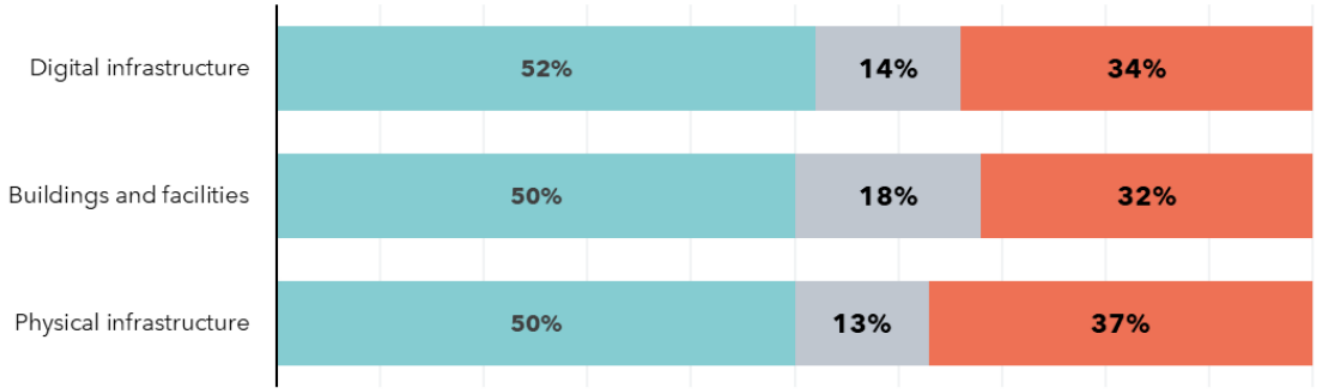
> *Boris, when trying to 'deliver Christmas', brought former CEO of Tescos into government as an advisor, and they were having daily/weekly calls for three months. They then made a report with recommendations to the government from within the Cabinet Office. It would be great to see a government bringing logistics into the centre of government, using Boris's plan as a blueprint.*
> - Business workshop participant

A significant proportion of businesses say that they do not think the UK Government is meeting its responsibilities to provide access to the necessary buildings, facilities, physical and digital infrastructure they need. Over a third (36%) say the government is not meeting its responsibility to provide businesses with access to the physical infrastructure they need, while 33% say the same for digital infrastructure and 30% for building and facilities. A general theme in our workshops and interviews with businesses was the need for the government to take responsibility for ensuring access to industrial infrastructure.

CHART 11

Around a third of businesses think the government is not meeting its responsibility to provide access to buildings and infrastructure

Question: Do you think that the UK Government is meeting its responsibility to provide businesses with access to buildings, facilities and infrastructure they need to grow?



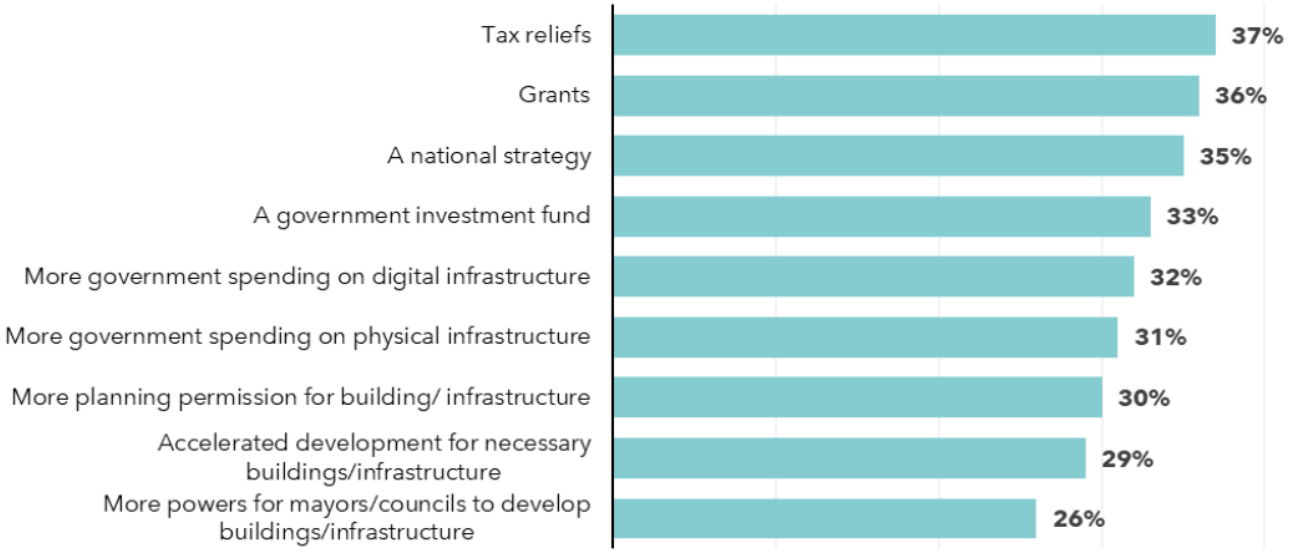
Source: Demos/FocalData Survey

Despite the significant focus that has been placed on devolution in recent years, the majority of businesses (71%) still see the UK government as most responsible for ensuring the UK has the buildings, facilities and infrastructure that it needs, with local councils (40%) and businesses themselves (40%) seen as other responsible parties.

CHART 12

Businesses think financial incentives like tax reliefs and grants would best help them develop needed buildings and infrastructure

Question: Which of the following, if any, do you think could improve your business' ability to access the buildings, facilities and infrastructure it needs to grow?



Source: Demos/FocalData Survey

When asked about what they thought could help improve access to the right industrial infrastructure, the majority of responses focused on increasing investment and tax reliefs for businesses building infrastructure. A national strategy by the central government was also more popular than increased powers to Mayors or Local Councils. This aligns with our workshops, in which businesses were sceptical about the role and ability of local authorities to lead to the provision of better infrastructure.

> *People in local authorities don't really understand what warehousing does - a better understanding of warehousing and its opportunities would help.*
> - Business workshop participant

> *Even if planning permission is allocated, there are many restrictions such as on traffic, timings, operations. [A] council recently put many restrictions on us, posing fines if too many vehicles are used on the roads each day. This means we can't change working patterns, or change for seasonal shifts in demand.*
> - Business workshop participant

OPTIMISM TEMPERED BY EXPERIENCE

Overall, we found that businesses were optimistic about the future, but with significant pockets of concern about key aspects of the overall business environment. Our survey has found that hundreds of thousands of businesses are being affected by the lack of access to suitable buildings and facilities, with similar proportions also concerned about access to physical and digital infrastructure. There was also concern that the UK Government is not doing enough to get a grip of the problems that businesses are experiencing in giving them access to the industrial infrastructure they need to thrive and grow.

However, in our workshops and interviews we found a genuine desire for partnership with government, business and society to make the UK into a world-beating economy. If we can put in place the right industrial infrastructure for businesses, there is cause for hope for the future.

3. UNSHACKLING THE SUPERPOWER
TRANSFORMING OUR INDUSTRIAL INFRASTRUCTURE

By analysing the literature and synthesising the insights in our workshop and interviews, we have identified six key issues that need to be resolved to turn the UK into a technology superpower, around:

1. Power
2. Buildings
3. Transport
4. Planning
5. Skills
6. Partnership with government

If any government is serious about turning superpower rhetoric into reality, they need to address these fundamental bottlenecks and barriers.

POWER

One of the biggest issues that came through our engagement with businesses was access to power.

Quick and easy access to electricity is necessary for the planning and business growth of many high-productivity, high-tech companies. Yet, UK businesses are facing huge barriers accessing electricity. Currently, around 200 gigawatts worth of electricity projects are in the queue for a grid connection.[28] Each project in the queue is potential investment and jobs that are not able to come on line.

We repeatedly found frustrations from businesses in our workshop and interviews about the delays in accessing power and the uncertainty about future availability. Between April and September 2020, the average wait time for connection to the UK's electricity network (the grid) after application was 15 months. Between October 2022 to March 2023, the average wait time had increased to 51 months (four years and three months). For connections in Northern England, it was 75 months (six years and three months). The UK has more requests for electricity connection stuck in the queue than any country in Europe.[29]

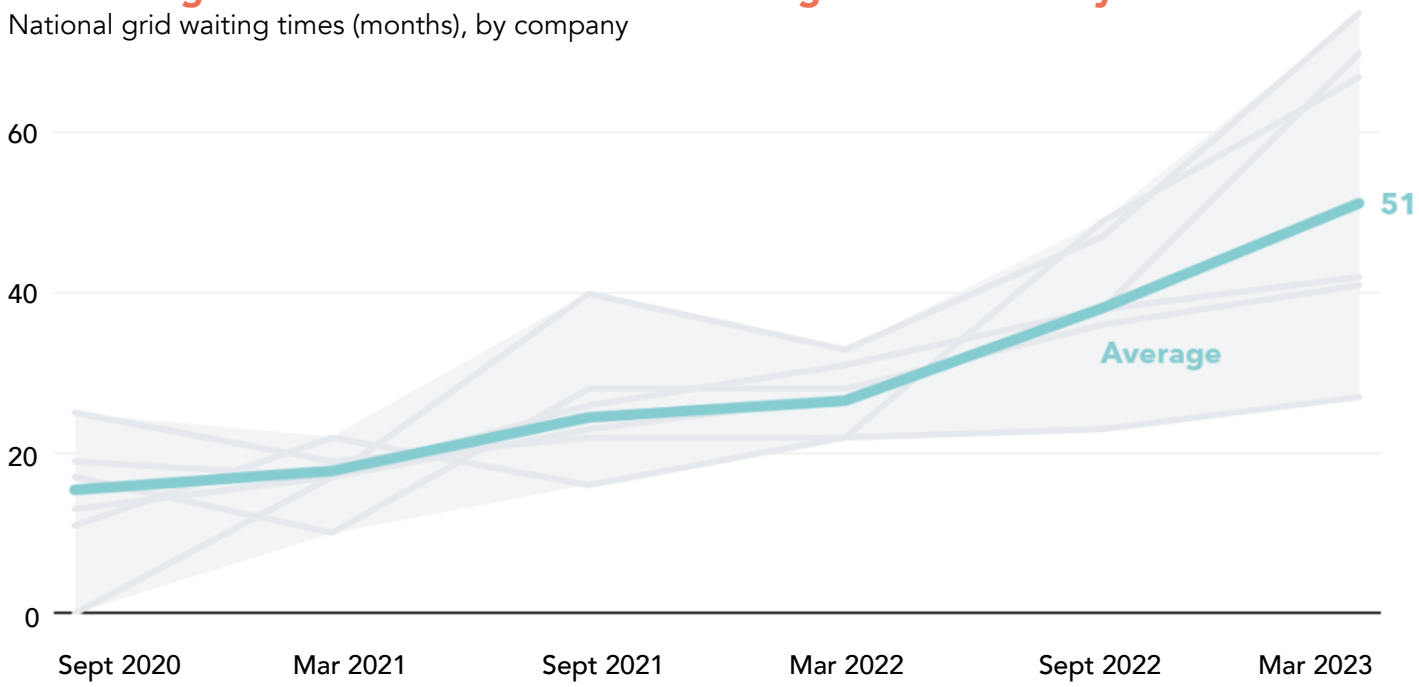
28 Energy Systems Catapult, Electricity Networks Commissioner – Companion Report Findings and Recommendations, June 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1175647/electricity-networks-commissioner-companion-report.pdf

29 Ambrose J, ''Lack of vision': UK green energy projects in limbo as grid struggles to keep pace', The Guardian, 8 May 2023, https://www.theguardian.com/business/2023/may/08/uk-green-energy-projects-in-limbo-as-grid-struggles-to-keep-pace

CHART 13

The average wait time for connection to the grid is over four years

National grid waiting times (months), by company



Source: National Grid ESO, Timely Connections Reports, 2020-2023, https://www.nationalgrideso.com/industry-information/connections/reports-and-registers

This has a real impact on businesses. There are reports, for example, of car manufacturers seeking a connection to solar capacity being told they'd need to wait until 2037 - 14 years away.[30] For businesses that cannot wait that long to know whether they will have access to the energy they need, this dampens investment and growth. It is also directly undermining the government's own Net Zero strategy which depends on the rapid electrification of surface transport.

> *Car charging is key. We can't get enough batteries in our site to charge the car park, let alone an electric fleet. The base generating capacity in the UK is lacking.*
> - **Business workshop participant**

Given our current rates of expanding electricity generation, we are falling behind our targets for industrial infrastructure and net zero. For example, the government's EV Energy Taskforce suggested that the UK needs 500,000 EV chargers by 2035, but at the current rate they won't hit this target until 2047.[31] It also means that businesses that want to be at the forefront of the latest technological developments in sustainable vehicles are simply unable to put them into practice in the facilities they currently are using. Logistics UK has highlighted that businesses are having to fund millions of pounds to upgrade their depots, but the data shows that even with this investment, access to power is uncertain.[32] This puts the UK at a competitive disadvantage with other countries who wish to capture the global market for environmentally sustainable products and services.

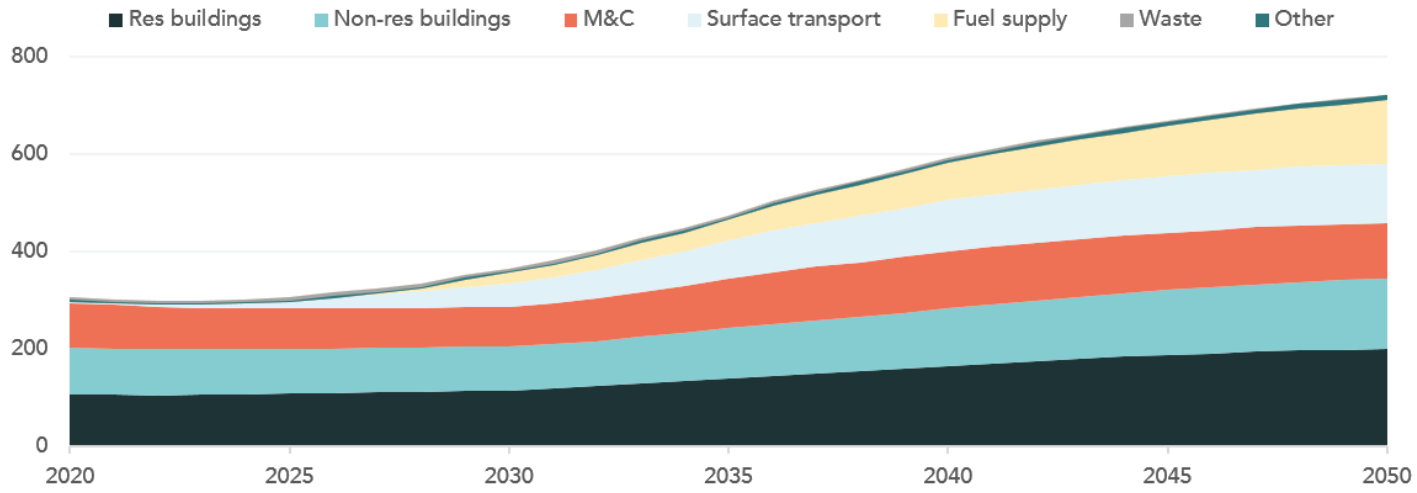
The unspoken challenge however is not just about our *current* energy needs but our *future* energy needs. As Chart 14 shows, electricity demand for surface transport, critical to many sectors of our economy including our logistics sector, will rapidly increase, becoming one of the biggest demands for electricity in the country. The scale of demand for electricity required by both the targets set by the government, the desire of businesses to make their operations more sustainable and the requirements of new technologies has simply not been significantly factored into decision making.

30 Ibid.
31 Tony Blair Institute for Global Change, Powering the Future of Britain: How to Deliver a Decade of Electrification, 19 June 2023, https://www.institute.global/insights/climate-and-energy/powering-the-future-of-britain-how-to-deliver-a-decade-of-electrification
32 Logistics UK, Energy support plans risk greener future for our industry, says Logistics UK, 20 January 2023, https://logistics.org.uk/media/press-releases/2023/january/energy-support-plans-risk-greener-future-for-our-i

CHART 14

Electricity demand is expected to increase rapidly in coming decades, primarily driven by surface transport and fuel

Expected electricity demand, by sector



Source: Climate Change Committee, Delivering a reliable decarbonised power system, 9 March 2023, https://www.theccc.org.uk/publication/delivering-a-reliable-decarbonised-power-system/

Current discourse has also not taken into account the need for energy in AI, automation and robotics. For example, economist Alex de Veries has indicated that one of the biggest bottlenecks for the development of AI is its power consumption. He estimates that by 2027, worldwide AI-related electricity consumption could increase by 85.4 to 134 TWh, particularly for data centres.[33] This is equivalent to the annual electricity consumption of countries such as the Netherlands, Argentina and Sweden.[34] Ofgem, the UK energy regulator, has already warned that we lack the energy infrastructure to enable the flourishing of technology businesses, including in AI.[35] If the UK does not have the industrial infrastructure to power this technological transformation, we will not be able to be the technological superpower we aspire to be.

The root cause is that the UK's electricity grid is expanding too slowly. The Climate Change Committee has a target for the UK to more than double its electricity grid capacity by 2035.[36] But if we continue at the rate of growth in grid capacity between 2012 and 2022, the target won't be reached until 2084.

On top of this, while the grid queue was previously more composed of a few large power plants, there is now a larger number of small renewable energy projects seeking connection, many of them related to our industrial infrastructure. Given each project requires a new connection point, this is placing more pressure on the energy system.

Part of the problem is underinvestment. The grid has recently planned expansions in its investment - but this is after queues have grown extensively.[37] The government set plans for power decarbonisation in 2021 and estimated that, to get there, between £280 and £400 billion of investment in electricity generating capacity and system flexibility was needed by 2037.[38] Yet, that investment hasn't followed.

33 Digiconomist, Powering AI could use as much electricity as a small country, 10 October 2023, https://digiconomist.net/powering-ai-could-use-as-much-electricity-as-a-small-country/
34 Ibid.
35 Seal T and Gillespie T, 'London's Aging Power Grid Undermines British AI Ambitions, Virtus Warns', Bloomberg, 23 June 2023, https://www.bloomberg.com/news/articles/2023-06-23/london-s-aging-power-grid-blocks-new-data-centers-virtus-says
36 Tony Blair Institute for Global Change, Powering the Future of Britain: How to Deliver a Decade of Electrification, 19 June 2023, https://www.institute.global/insights/climate-and-energy/powering-the-future-of-britain-how-to-deliver-a-decade-of-electrification
37 Ambrose J, 'National Grid increases investment plan but warns of clean energy logjam', The Guardian, 9 November 2023, https://www.theguardian.com/business/2023/nov/09/national-grid-steps-up-clean-energy-plans-amid-35bn-record-spend
38 National Audit Office, Decarbonising the power sector, 1 March 2023, https://www.nao.org.uk/wp-content/uploads/2023/03/decarbonising-the-power-sector.pdf

It takes significant time to raise the private investment required to deliver these projects - which is time that the UK simply does not have. Frustratingly, the savings generated by investments will offset the costs. Analysis by the National Audit Office (NAO) indicates that if investing in sufficient electricity generation now, the cost savings would offset the capital costs by 2044.[39] If we can deploy capital quickly enough, we can generate significant savings and returns on investment. However, the NAO has found the lack of a clear plan from the government on grid capacity may be limiting private investment.[40] There remain uncertainties around government plans for decarbonising, such as around new locations for power generation and contingency plans given potential setbacks.

Planning is also part of the problem. The National Grid's CEO says "fundamental reform" of the UK's electricity network planning is required, for example by enabling Ofgem to approve investment in the network on a rolling basis, rather than only after an investor is identified at specific decision periods.[41]

Underlying the planning problems is the fact that the grid runs the queue for electricity connection on a first-come-first-serve basis. This means some businesses, if they anticipate potentially needing more power in the future, will join the queue to secure their place. Some of those businesses will not need power in the end, but this has clogged up the queue. Ofgem's chief executive referred to this as a "legacy of stalled, unviable and often highly speculative 'zombie' projects blocking ready-to-go solar, wind and other renewable schemes".[42] To address this, the grid offered to help customers to leave the queue without incurring penalties until April 2023.[43] While this helped to alleviate some of the pressures, the wait times have still risen - indicating the need for further action.

Although National Grid is now proposing further queue reforms in the future - including to move away from the first-come-first-serve approach to a 'connect or move' approach - if a project hasn't met certain milestones in the process of getting connected, grid capacity is still not being strategically managed.[44] If the government wants the UK to be a technology superpower, we need to make sure that our industrial infrastructure has priority alongside other critical net zero projects. This is in line with plans outlined by National Grid, but needs urgent attention from policy makers.[45]

BUILDINGS AND FACILITIES

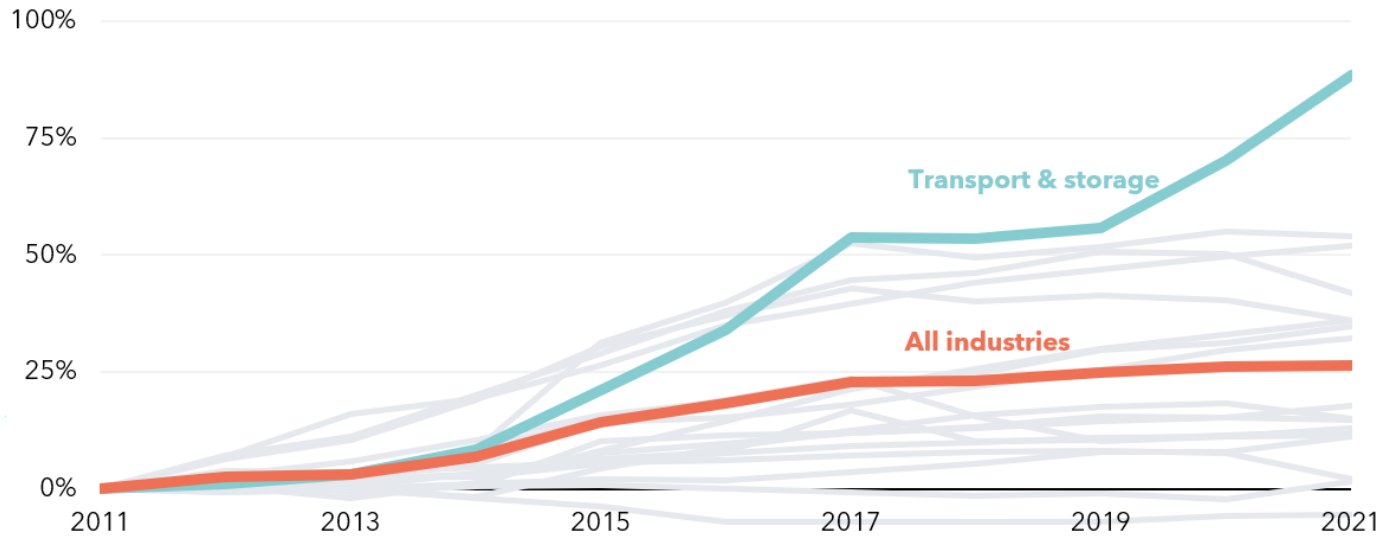
Advanced manufacturing, data centres, logistics and storage, laboratories, and other foundations of advanced tech require large building developments. As demand for these has grown, so too have the number of premises. For transport and storage, in particular, the number of business premises grew faster than any other industry between 2011 and 2021.[46]

39 Ibid.
40 Ibid.
41 National Grid, Delivering for 2035: Upgrading the grid for a secure, clean and affordable energy future, accessed 5 November 2023, https://www.nationalgrid.com/document/149501/download
42 Ambrose J, 'National Grid calls for regulation changes as profits jump to £4.6bn', The Guardian, 18 May 2023, https://www.theguardian.com/business/2023/may/18/national-grid-profits-green-energy-delays-electricity
43 National Grid ESO, 'Our five-point plan', accessed 5 November 2023, https://www.nationalgrideso.com/industry-information/connections/what-are-we-doing-now-our-five-point-plan
44 National Grid, How we're working with industry to reform transmission connections for a net zero future, 22 September 2023, https://www.nationalgrid.com/electricity-transmission/industry-reform-transmission-connections
45 Ibid.
46 ONS, The rise of the UK warehouse and the "golden logistics triangle", 11 April 2022, https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/articles/theriseoftheukwarehouseandthegoldenlogisticstriangle/2022-04-11

CHART 15

The transport and storage industry has seen a bigger increase in business premises since 2011 than any other industry

Percentage change in number of business premises by industry since 2011



Source: ONS, The rise of the UK warehouse and the "golden logistics triangle", 11 April 2022, https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/articles/theriseoftheukwarehouseandthegoldenlogisticstriangle/2022-04-11

Despite this, there is evidence that supply is still lacking. Research by Savills found that, due to low supply of industrial and logistical space, the demand for it was being suppressed by around 29%.[47] In effect, this means that if we were able to provide the facilities that businesses need, there would be nearly 10 million square feet in additional infrastructure compared to what is currently provided. Similarly, while the UK has twice as many e-commerce sales per capita than France, it has a similar amount of industrial space per capita.[48] The scarcity of this is a huge brake on the ability of the UK to develop and implement new technologies and create the jobs of the future.

The UK is also seeing increasing demand for data centres. In a global data centre survey, 88% reported that demand for DC capacity for artificial intelligence/machine learning projects is increasing rapidly.[49] Yet, data centre construction is failing to keep up. 83% of respondents said that data centre construction has struggled to meet industry demand in 2023.[50]

The value of data centres is also expected to grow rapidly. The market in the UK is expected to grow by 28% from 2023 to 2028 from £11.9 billion to £15.3 billion.[51] However, if the UK is to be a superpower, it will need to grow even faster than that. Global growth of data centres is currently at 18%, but in the UK it is only at 5.5%.[52] Although some of that can be explained by developing countries growing capacity from a low base, if the UK wants to retain global leadership it will need to build and develop data centres at a faster pace than its competitors. In France, for example, data centre market growth is at 8.5%.[53]

We also see constraints on laboratory space in the UK. Research by Savills has identified a "chronic shortage" in laboratory space in city centre locations, where many businesses want to be located to get access to

47 Savills, Levelling Up - The Logic of Logistics, 22 April 2022, https://www.savills.co.uk/research_articles/229130/326244-0
48 Thomas H, 'Britain needs to take its sheds more seriously', Financial Times, 17 October 2023, https://www.ft.com/content/ec6ba99f-93c6-430c-ac77-ad6038216c2d
49 Best R, Demands – and opportunities – for a new digital age, Turner and Townsend, accessed 10 November 2023, https://reports.turnerandtownsend.com/dcci-2023/foreword
50 Ibid.
51 Mordor Intelligence, UK Data Centre Market - Size, Growth, Industry Report, accessed 15 November 2023, https://www.mordorintelligence.com/industry-reports/united-kingdom-data-center-market
52 Harwood, One sector of the UK economy is booming – data centres, 14 July 2023, https://harwood.uk.com/data-centres/
53 Mordor Intelligence, France Data Centre Market - Size, Growth, Industry Report, accessed 15 November 2023, https://www.mordorintelligence.com/industry-reports/united-kingdom-data-center-market

the best talent.[54] Across London, Oxford and Cambridge alone there are over 4 million square feet of laboratory space requirements, but there is no plan for delivery of the space that businesses need.[55] This is directly undermining the competitiveness of the country's life sciences industry. The UK's Life Sciences Competitiveness Index has found that growth in the UK's productive capacity on pharmaceuticals, for example, has flatlined despite the initial boost given by the pandemic.[56,57]

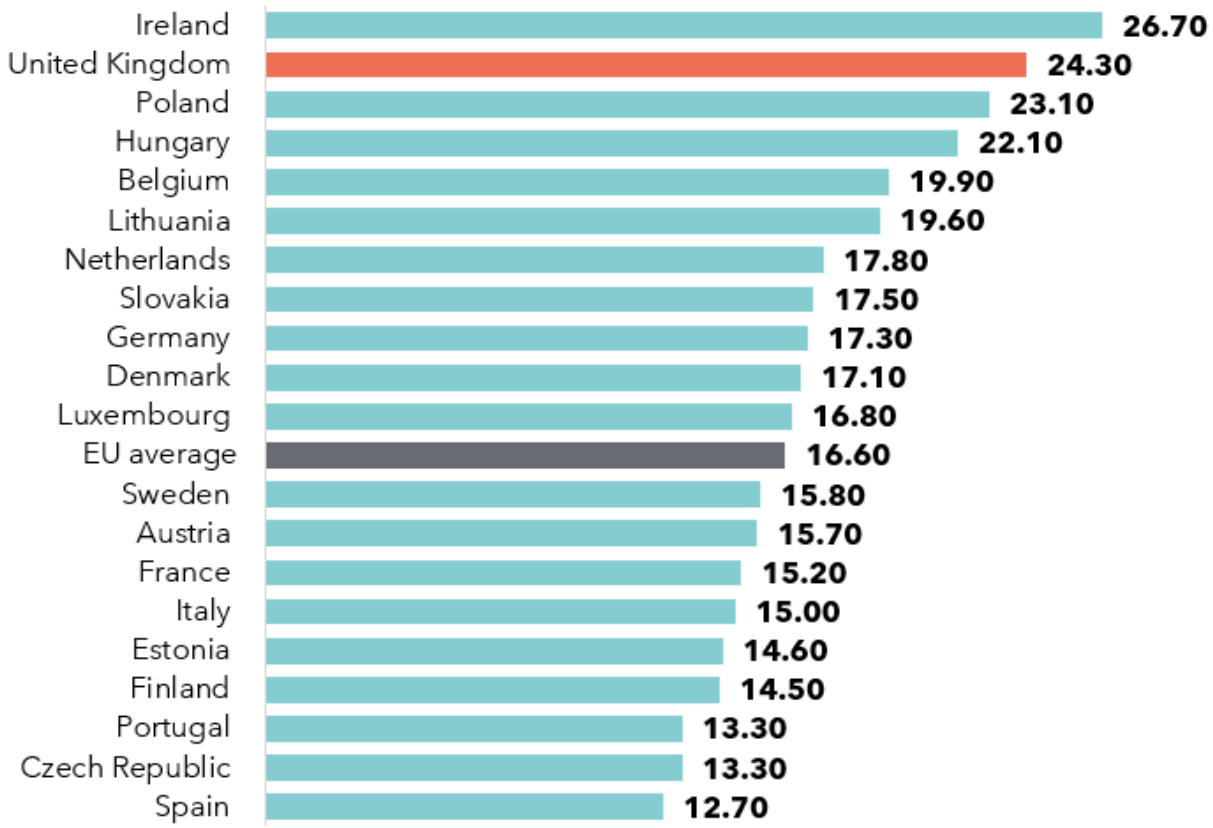
TRANSPORT

Inefficiencies exist across the UK transport system. On roads, research commissioned by the National Infrastructure Commission found that the UK's transport sector is worsening in recent years, with congestion on our roads now costing around £6bn a year.[58] This is also likely to worsen in the future, with the number of delays to Heavy Goods Vehicle (HGV) journeys increasing from 23% of all journeys to 35% by 2050.[59] As Chart 16 shows, UK roads already compared poorly with our competitors in Europe in 2012, with the European Joint Research Centre finding the UK has some of the worst road congestion levels in Europe.

CHART 16

Delays on UK roads are the second longest out of all European countries

Average delay per km of driving on roads with speed limit under 50km/h, seconds, 2012



Source: European Joint Research Centre, Measuring Road Congestion, 2012, https://publications.jrc.ec.europa.eu/repository/bitstream/JRC69961/congestion%20report%20final.pdf

54 Savills, Spotlight: Life Sciences – Trends and Outlook 2023, 21 March 2023, https://www.savills.co.uk/research_articles/229130/340692-0
55 Ibid.
56 Logistics UK, Seven in ten logistics operators report escalating costs as fuel prices soar, Logistics UK survey finds, 6 May 2023, https://logistics.org.uk/media/press-releases/2022/may/seven-in-ten-logistics-operators-report-escalating
57 Department for Science, Innovation & Technology and Department of Health & Social Care, Life sciences competitiveness indicators 2023, 13 July 2023, https://www.gov.uk/government/publications/life-sciences-sector-data-2023/life-sciences-competitiveness-indicators-2023#section-3-production-environment
58 Ibid.
59 Ibid.

Looking to rail freight, we've seen a significant decrease in expenditure in recent years. Spending on rail infrastructure has fallen by 17% since 2015-16, despite promises to increase investment.[60] The same story is true for the aviation system. The UK's air transport infrastructure is one of the worst ranked amongst the majority economies, with only Italy ranking lower in the G7.[61] Our airports are some of the most congested in Europe, with Heathrow, Gatwick and Manchester having the highest levels of delays on departures and arrivals across Europe.[62] We heard a number of cases from our workshop with businesses about how these delays were having a material impact on their businesses.

Poor road and rail infrastructure has also had a knock-on impact on the UK's maritime freight. Although investment in ports has increased, there are concerns about the ability for ports to expand if they cannot connect efficiently to the road and rail that takes goods onto the next part of their journey.[63]

The lack of investment and congestion is increasing costs for businesses, reducing their profitability and future scope for investment. A survey of firms by Logistics UK found that 40% of respondents had seen their costs increase by 25% or more in the past year, increasing the cost of transporting goods.[64] These costs hinder business growth. Accordingly, economists have found that the UK's lack of investment in infrastructure has had a long term negative drag on the UK's overall growth.[65]

Taken together the UK's transport infrastructure requires significant investment over the coming years if the UK hopes to be a technological superpower.

The good news is that with the right incentives and investment, technology has the potential to significantly improve the UK's transport infrastructure. AI and self-driving vehicles can help to improve route optimisation, congestion and manage demand for infrastructure. Although there is more that can be done, a recent briefing by Deloitte on the UK's logistics sector found an increasing deployment of technology in the sector.[66] Yet, private investment is dependent on patient and strategic long term investment from the government to create the enabling environment for business.

Policy makers need to make an active choice to increase investment in our transport system, which is key to our industrial infrastructure, if they want to create the foundations for a technological superpower.

PLANNING

In the UK, most planning decisions are made by local authority planning teams. There are statutory time limits on these decisions, of 13 weeks for major developments and eight weeks for most other applications.[67] Yet, performance has been very poor over the last decade, with planning decisions across the UK's regions taking on average between 14 weeks (in the West Midlands) and 24 weeks (in Scotland).[68] Performance improved in 2022, however, with decisions taking on average 10.5 weeks (in London) to 14 weeks (in Scotland).

On top of the initial application, however, appeals can take even longer. The average time for an appeal decision between June 2022 and May 2023 was 29 weeks.[69] This extended process adds significantly to business uncertainty, costs, and delays.

60 National Audit Office, A financial overview of the rail system in England, 26 April 2021, https://www.nao.org.uk/wp-content/uploads/2021/04/A-financial-overview-of-the-rail-system-in-England.pdf
61 OECD, Improving Infrastructure in the United-Kingdom, 6 July 2015, https://one.oecd.org/document/ECO/WKP(2015)62/En/pdf
62 Ibid.
63 Maritime UK, State of the Maritime Nation 2022, August 2022, https://www.maritimeuk.org/state-of-the-maritime-nation/
64 Logistics UK, Seven in ten logistics operators report escalating costs as fuel prices soar, Logistics UK survey finds, 6 May 2023, https://logistics.org.uk/media/press-releases/2022/may/seven-in-ten-logistics-operators-report-escalating
65 Zhang Y and Cheng L, The role of transport infrastructure in economic growth: Empirical evidence in the UK, Transport Policy, March 2023, https://www.sciencedirect.com/science/article/pii/S0967070X23000239
66 Deloitte, Transforming logistics: A sector fit for the future, 2021, https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/consumer-business/deloitte-uk-ths-logistics-report-final.pdf
67 Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, Determining a planning application, 6 March 2014, https://www.gov.uk/guidance/determining-a-planning-application
68 Gibbs H, Planning Permission: All the Data From SearchLand, 1 March 2023, https://searchland.co.uk/blog/planning-permission-in-2022-all-the-data-from-searchland
69 Planning Inspectorate, Planning Inspectorate statistical release, 22 June 2023, https://www.gov.uk/government/statistics/planning-inspectorate-statistical-release-22-june-2023/planning-inspectorate-statistical-release-22-june-2023

Recently, we spent two years trying to get a location, then it got refused. Local authorities are meant to have a 13-week determination period for planning decisions - but I've never experienced it happening that quickly.
- Business workshop participant

On the one hand, there is a lack of capacity. While local government has faced cuts across the board in the past decade, planning teams have faced the highest cuts between 2009/10 and 2020/21, with the net spend per person falling by 43%.[70] In the North East of England, it's decreased by 62%. Across England, just 0.45% of local government budgets were spent on planning services. This in turn is related to a problem with skill shortages. In a survey of local authorities by the Royal Town Planning Institute, 80% reported a shortage of planning officers and 70% reported difficulties recruiting enforcement officers in the last five years.[71] Both heavy workloads and low pay are driving this.

The government has made some attempts to address these issues. It introduced the Planning Skills Delivery Fund in 2023, providing £24 million over two years to local authorities.[72] Yet, this is around an extra 2.5% for planning services annually over two years - not coming close to reversing the 43% decline we've seen since 2009/10.

A final problem comes with management of the planning process. One industry leader told us how, in one of their planning applications, a huge amount of company time was committed to ensuring adherence to fire safety regulations, before the application was then rejected on the basis of more general concerns about the size and location of the building.

[Planning departments] are not looking at 'is this the right building in the right location', it's more about 'are the right fire safety reports there etc'.
- Business workshop participant

It's crazy the investment you need to make to drive through the planning system without any chance of success.
- Business workshop participant

However, another challenge is the attitude towards industrial infrastructure. Beyond the time taken to make decisions, there is also a problem with how decisions are made. A recent high profile case saw a £2.5bn investment in a data centre based in a former quarry near a motorway refused by the local authority and national government due to concerns about the impact on the "rural feel" of the area.[73] This aligns with the views of businesses we engaged with, who expressed a concern that planning teams are not sufficiently engaged or supportive of the needs of industrial infrastructure.

Several factors drive this problem.

This first is lack of understanding. Businesses explained to us that planning teams often lack an understanding of what industrial infrastructure does, including how it contributes to the wider economy, and the impact of placing particular restrictions on it.

A second problem appears to be a lack of appreciation for how industrial infrastructure connects and enables the rest of the economy, including our future technological development. Industrial infrastructure has impacts far beyond any one local authority, but our planning system is based on analysing the benefits purely at a local level.

A third problem is inconsistency. If local authority planning teams have very different approaches, businesses have to learn about and adapt to each authority every time they want to apply for a new development in

70 Royal Town Planning Institute, 'Planning Agencies', accessed 17 November 2023, https://www.rtpi.org.uk/policy-and-research/research/planning-agencies/
71 Royal Town Planning Institute, 'Almost 90% of Local Authorities surveyed struggling with backlog of planning enforcement cases', 28 November 2022, https://www.rtpi.org.uk/news/2022/november/almost-90-of-local-authorities-surveyed-struggling-with-backlog-of-planning-enforcement-cases/
72 Local Government Association, 'So you want to apply for the Planning Skills delivery Fund', accessed 27 November 2023, https://www.local.gov.uk/pas/find-event/pas-past-events/so-you-want-apply-planning-skills-delivery-fund-august-2023-events
73 Titcomb J, 'Nimbys' 'green belt theology' blamed for blocking digital growth', The Telegraph, 10 November 2023, https://www.telegraph.co.uk/business/2023/11/10/nimbys-green-belt-block-digital-growth-m25-data-centre/

different districts. This is time consuming and can lead to friction in the processes.

> *The performance of planning systems was completely inconsistent between local authorities.*
> - Business workshop participant

The cost, delays and inconsistency of the planning system has been well documented by other reviews. The UK will fail to become a technological superpower if we are not able to strategically plan for our industrial infrastructure needs and ensure that planning is carried out as quickly and efficiently as possible.

SKILLS

The workforce is at the core of industrial infrastructure, yet the UK has a number of skills shortages. TRegarding STEM skills (science, technology, engineering and maths), the Institution of Engineering and Technology (IET) estimates in December 2022 that there was a shortfall of 173,000 workers in UK STEM sectors - ten unfilled roles per business.[74] They found that half (49%) of engineering and technology businesses were having troubles recruiting these skills.

This is holding back the development of our industrial infrastructure in the UK. The IET cost the impact of STEM shortages to the economy at £1.5bn annually.[75] This is particularly a big problem for the construction industry - necessary to build the UK's industrial infrastructure. A report in October 2023 determined that labour shortages are "now the most concerning risk factor within the construction sector", in part based on labour costs increasing by 8.3% increase over 2023.[76,77] This, alongside material cost increases, is expected to add £900 million worth of costs to UK's infrastructure in 2023.[78]

Part of these skills should be developed through apprenticeships. However, takeup of science apprenticeships has declined 31% between 2016/17 to 2019/20.[79]

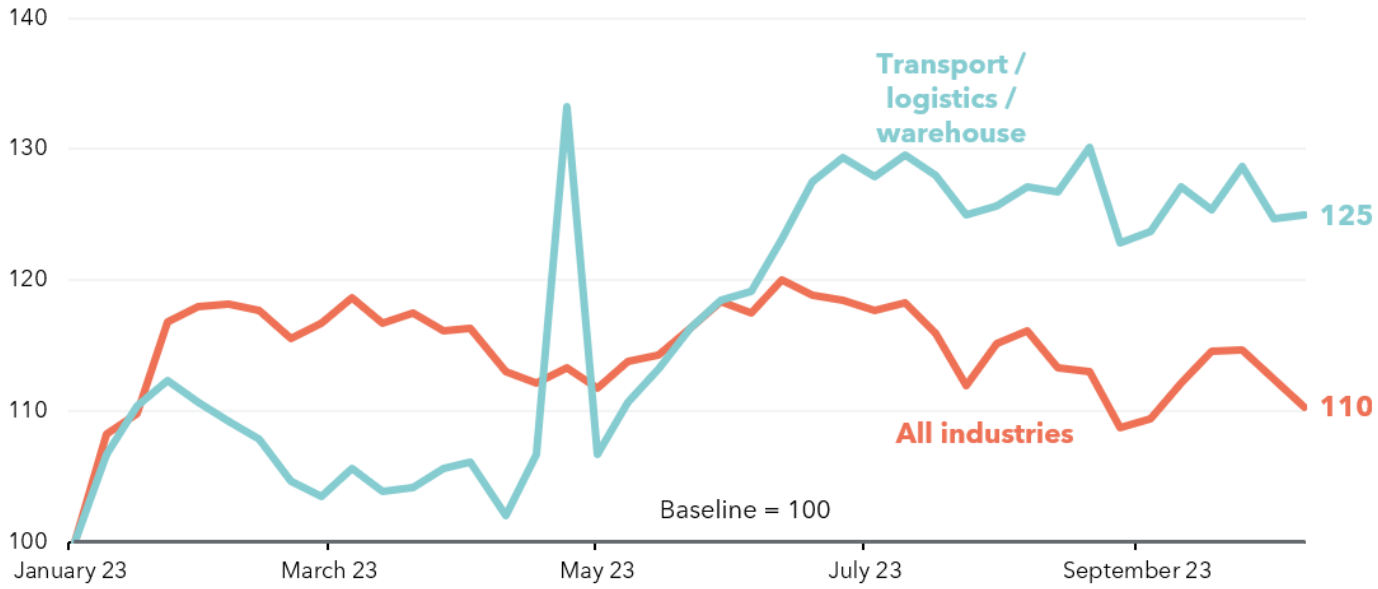
The logistics and warehousing sector, a critical part of our industrial infrastructure, is facing particular problems with labour shortages. Job vacancies have increased in the transport and logistics by around 25%. A survey from across the Chartered Institute of Logistics and Transport's membership revealed that 86% of companies have experienced warehouse operative staff shortages in the past two years.[80] 60% of respondents also experienced a shortage of drivers in the past two years. However, it is important to note that logistics and warehousing are not low paid sectors of the economy. For example, logistics jobs pay £4.9k a year more on average than those in the rest of the economy, according to research by Savills.[81] Analysis of ONS data also found that the biggest increase in jobs has been in professional occupations and associate professional and technical occupations, which are traditionally highly paid.[82]

74 Institution of Engineering and Technology, Engineering Kids' Futures, January 2023, https://www.theiet.org/media/11077/engineering-kids-futures.pdf
75 Ibid.
76 Currie & Brown, UK construction market outlook, October 2023, https://www.curriebrown.com/media/4pbfx45p/uk-construction-report_q323_final2.pdf
77 Johnson T, 'Construction industry's labour and skills shortages could impact UK national infrastructure pipeline delivery', New Civil Engineer, 5 June 2023, https://www.newcivilengineer.com/latest/construction-industrys-labour-and-skills-shortages-could-impact-uk-national-infrastructure-pipeline-delivery-05-06-2023/
78 Ibid.
79 Royal Society of Chemistry, Call for more science apprenticeships in bid to plug STEM sector skills gap, 10 February 2022, https://www.rsc.org/news-events/articles/2022/feb/apprenticeship-week/
80 Chartered Institute of Logistics and Transport, More than 80% of organisations experiencing staff shortages in the warehouse, a survey by CILT(UK) reveals, 1 June 2023, https://ciltuk.org.uk/News/Latest-News/ArtMID/6887/ArticleID/36715/More-than-80-of-organisations-experiencing-staff-shortages-in-the-warehouse-a-survey-by-CILTUK-reveals
81 Savills, Levelling Up - The Logic of Logistics, 22 April 2022, https://www.savills.co.uk/research_articles/229130/326244-0
82 Ibid.

CHART 17

Job vacancies in the transport and logistics sector are 25% higher than at the start of 2023

Change in number of job adverts (de-duplicated) since January 2023, by sector



ONS, VACS02: Vacancies by industry, 14 November 2023, https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/datasets/vacanciesbyindustryvacs02

Part of this is a problem of awareness. The sector contributes £232 billion to the UK economy a year and employs 3 million people.[83] Despite this, over 90% of the public have never considered a career in logistics.[84]

> *People don't know what we do and we've pulling from the same pool of people, even with greater automation - this could be a great industry for highly skilled individuals, but there isn't enough awareness.*
> - Business workshop participant

Part is also a problem of conditions. In surveys, "demanding" and "boring" are among the most common words associated with warehouse work.[85] Lack of automation could itself be a factor here. Surveys have found that nearly 3 in 4 (74%) warehouse workers are at least somewhat likely to take a pay cut to work at another company with more technology tools to help them do their job, including more than half (52%), who are extremely or very likely.[86] However, it is difficult to implement new technologies to make these jobs more rewarding due to the challenges of upgrading existing facilities.

As we note at the end of this report, the benefits in logistics alone through increasing investment in industrial infrastructure could be significant, but we will also need to generate the skills base to make those jobs a reality.

83 Ibid.
84 Orderwise Forterro, Addressing the UK's warehouse labour shortage, accessed 17 November 2023, https://orderwise.co.uk/en/blog/addressing-the-uks-warehouse-labour-shortage
85 Ibid.
86 Lucas, Lucas Insights: Voice of the Warehouse Worker, accessed 17 November 2023, https://www.lucasware.com/voice-of-the-warehouse-worker/

PARTNERSHIP WITH GOVERNMENT

The long term nature of the investments in industrial infrastructure means that an effective partnership between the private sector and government is essential. Unfortunately, developing an effective partnership has been problematic in recent years for a number of reasons.

Firstly, businesses we engaged with found that it was challenging for the sector to speak with one voice due to the wide range of industrial infrastructure providers. Even within logistics, there are multiple business groups representing different aspects of the sector. This means that it can be challenging for the government to know who to speak with and how to consult with the sector on key decisions.

Secondly, there has been variations in government policy towards this part of our economy. As we have noted above, between the late 1990s and early 2010s, central government invested less into infrastructure than comparator countries around the world. There was a general policy of believing that the private sector alone could develop the infrastructure that businesses required. Where investment was pursued, it used models such as Private Finance Initiatives to leverage private investment to keep them off the government balance sheet.

This then changed under the May and Johnson Ministries where significant investment was put on the table for industrial infrastructure, including a £31bn National Productivity Fund. However, this fund was then discontinued and the status of the projects initially identified to be funded is unknown. In the most recent Spring Budget, capital budgets were frozen in cash terms, but with inflation in the construction sector running at 10%, this means that investment will be much lower in real terms.[87] This means that a number of projects currently on the books will need to be scrapped. This also does not include the significant uncertainty created by the decision to scrap HS2 and the status of Network North. A lack of consistency has made developing a partnership with the government challenging.

Finally, there is a perceived lack of understanding and expertise within the government about the sector. In part, this is because of the fragmentation within government itself. Industrial infrastructure is not centrally owned by any one government department but is stretched across numerous parts of the state - from the Department for Transport (DfT) to the Department for Levelling Up, Housing and Communities (DLUHC), Department for Business and Trade (DBT) and numerous other public bodies. This makes the development of central expertise difficult and also means that departments struggle to connect different parts of the sector together and understand industrial infrastructure holistically. The lack of a central oversight of industrial infrastructure is part of the reason why the important connection between these facilities and our aspirations to be a technological superpower have not been identified and properly addressed in previous frameworks and strategies.

The exception to the rule was the general improvement that was seen during the pandemic, where the government recognised the value of the sector and put in place appropriate channels of communication. However, the view from the businesses we engaged with was that interest in the sector had diminished as the problems created by the pandemic had faded from view.

The evidence is clear that unless the UK recognises the value of our industrial infrastructure and puts in place policies to address the bottlenecks and barriers that we face in expanding it, we are unlikely to be the technological superpower that policy makers have aimed for. Our next section outlines what the government should do to put in place the policy foundations to address the challenges.

87 Emmerson C, Stockton I and Zaranko B, The fiscal backdrop to Spring Budget 2023, Institute for Fiscal Studies, 28 February 2023, https://ifs.org.uk/articles/fiscal-backdrop-spring-budget-2023

4. FROM RHETORIC TO REALITY
CREATING INDUSTRIAL INFRASTRUCTURE FIT FOR A TECHNOLOGY SUPERPOWER

Addressing the issues laid out in the report will require a comprehensive set of policy solutions and a commitment to partnership with businesses. As we have noted throughout this report, the ambition and optimism is there, but the government has a critical role to play in creating the policy architecture which can turn rhetoric for a superpower into reality.

In this section we outline six policies that the government should put in place to address the bottlenecks and barriers facing the UK's industrial infrastructure.

1. Ensure that the Department for Science, Innovation and Technology's cross-government action plan to make the UK a technology superpower addresses our industrial infrastructure needs
2. Merge the National Infrastructure Commission with the UK National Infrastructure Bank to create a 'Super Agency' - the National Infrastructure Delivery Authority (NIDA) to advise, plan and finance major infrastructure projects across the UK
3. Create a presumption in favour of development of industrial infrastructure within the National Planning Policy Framework (NPPF)
4. Increase and ring-fence spending on local authority planning teams with central government investment over ten years
5. The Department for Energy Security and Net Zero to work with Ofgem and National Grid to create a "Priority Power Access Plan" which puts industrial infrastructure projects at the front of the queue for grid access and provides investors with certainty
6. Extend 'Investment Zone' Structures and Buildings Allowance rules to cover the whole of the UK

Taken together, these would encourage greater partnership between businesses and government, attract investment and address the bottlenecks in planning and power which have been identified as the biggest challenges facing our industrial infrastructure.

1. ENSURE THAT THE DEPARTMENT FOR SCIENCE, INNOVATION AND TECHNOLOGY'S (DSIT) CROSS-GOVERNMENT ACTION PLAN TO MAKE THE UK A TECHNOLOGY SUPERPOWER ADDRESSES OUR INDUSTRIAL INFRASTRUCTURE NEEDS

The UK Science and Technology Framework, Future of Compute Review and Cyber-Physical Infrastructure review all failed to give serious attention to the need for appropriate industrial infrastructure to ensure that the UK can effectively transition to a technology superpower. The House of Lords' Science and Technology Committee's review into the national aspiration to become a technology superpower also failed to address the infrastructure needs.

The danger is that the UK's aspirations are considered in a narrow silo of R&D spending. It is also important to consider how we adopt new technologies across our wider economy, manufacture and distribute the products developed through innovation and build a system to export these products overseas. A lack of attention to these issues will not only create new bottlenecks, but through hampering growth, it will deprive the UK of revenues that we need in future years to invest in R&D. DSIT urgently needs to address this blind spot and ensure that industrial infrastructure is given a seat around the table.

In the Science and Technology Framework, DSIT committed to developing a cross-government action plan to implement the strategy. It is vital that this action plan includes our industrial infrastructure and addresses:

a. How the UK will expand access to buildings and facilities that utilise the latest technologies;

b. How the UK will retrofit and upgrade existing buildings and facilities for the technologies for the future, particularly their energy needs;

c. How the UK will ensure adoption of technology in key 'enabling' sectors such as logistics and transportation which underpin the capacity of the wider economy.

This should be developed in consultation with businesses, academics and other experts and regularly reviewed as part of oversight of the overall framework. The UK also needs a wider strategy for technological adoption across the wider economy which has been a weakness for decades. However, the initial start should be made on the urgent gaps in the UK's industrial infrastructure.

2. THE NATIONAL INFRASTRUCTURE DELIVERY AUTHORITY (NIDA)

In recognition of the relative lack of attention given to infrastructure in recent decades, the government has developed a number of institutions to rectify these challenges including the Infrastructure and Projects Authority, National Infrastructure Commission, the Major Projects Authority and the UK National Infrastructure Bank. It has also published a number of strategic documents such as the National Infrastructure Strategy, the National Infrastructure Assessment and National Infrastructure and Construction Pipeline. Some Combined Authorities and local authorities also have a range of new powers around planning and infrastructure.

Although the increased focus on infrastructure is welcome, the fragmentation of these important functions across different agencies and departments creates significant delivery risks. Repeated studies have identified the fragmented and at times contradictory decision making of the government as holding back the development of the UK's industrial infrastructure.[88,89,90] For example, the investment objectives of the National Infrastructure Bank could be undermined by a lack of planning permissions provided through the Planning Inspectorate. Over time a disconnect between the priorities identified by the National Infrastructure Commission, the financing decisions of the Bank and the planning decisions made by the Inspectorate may emerge. There is also the risk of competing advice for policy makers from these different institutions - give their different objectives and goals - and of significant time lags and conflicting strategic cycles across, contributing to slow decision making - another strategic weakness for the UK.[91]

88 RIBA, New report reveals UK transport infrastructure exacerbates housing crises, 17 July 2018, https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/uk-transport-infrastructure-exacerbates-housing-crisis

89 Richardson J et al, Power to the People: How to unlock energy infrastructure by securing community support, Onward, July 2023, https://www.ukonward.com/wp-content/uploads/2023/07/Power-to-the-People-Final-Final-Final.pdf

90

91 PWC, Speed is of the essence: Accelerating UK infrastructure projects – Four key areas of opportunity, August 2020, https://www.pwc.co.uk/industries/real-estate-and-infrastructure/real-assets/accelerating-uk-infrastructure-projects.html

Initial suggestions have proposed devolving more power for economic development to Combined Authorities, including from the National Infrastructure Commission itself.[92] However, this fails to take into account that previous attempts to devolve economic development at a more local level has had limited success. An evaluation of Regional Development Agencies (RDAs) by the National Audit Officer found that they often struggled to coordinate across various local authorities and public agencies.[93] The same will likely be a problem for Combined Authorities. Moreover, many projects stalled because of issues related to finance, which was provided separately to the RDAs. Although Combined Authorities have been given access to additional funding, often this is quite small. For example, the Institute for Government indicates that the total "single pot" of funding available to the Mayors of Greater Manchester and the West Midlands would be only £700-730m a year - equivalent to around £200-260 per person in these regions.[94]

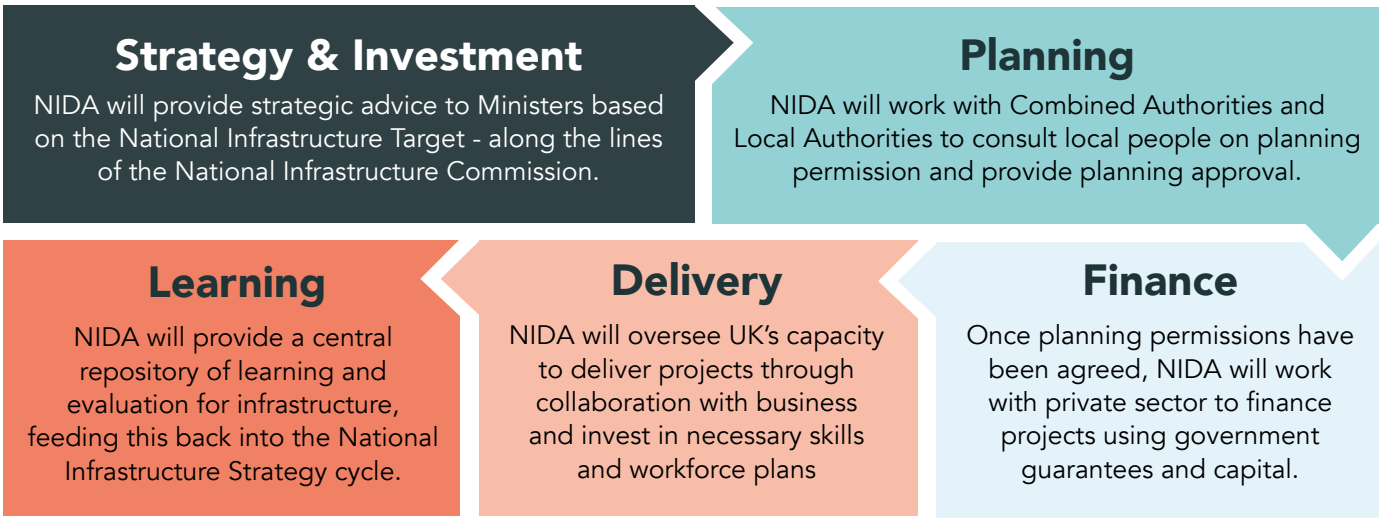
Another initiative to address these issues were Local Enterprise Partnerships. These were developed to operate at a more local level to overcome the challenge of coordination and build support from local business. However, they also encountered delivery problems and were recently abolished by DLUHC. Although Combined Authorities may be able to overcome these significant challenges, the track record of attempts to localise and regionalise issues of industrial infrastructure have not been successful.

Historically, countries which have become technological superpowers, such as Japan, have instead done this through the *centralisation* of decision making (for example through the post-war Ministry of International Trade and Industry), to enable the rapid development of the necessary industrial infrastructure.[95]

An alternative evidence-based approach therefore, would be to create a new 'Super-Agency', the National Infrastructure Delivery Authority (NIDA), which would bring together all the government agencies and public bodies working on infrastructure together in one place, and create a 'conveyor-belt' approach to infrastructure as outlined by Figure 2. The simple goal of NIDA would be to accelerate the development and delivery of infrastructure projects of all sizes. This could give the UK a world-beating industrial infrastructure so that the UK can maintain its position as a global economic leader.

Overnight, a new delivery authority with strategic expertise on infrastructure, access to £12bn in government funding and with oversight of the planning process would be created - a powerful new engine for the development of industrial infrastructure. The NIDA would combine several functions that are currently the purview of other departments agencies, while partnering with Combined Authorities and Local Authorities through the planning and development process.

FIGURE 2
THE NATIONAL INFRASTRUCTURE DELIVERY AUTHORITY



92 National Infrastructure Commission, Infrastructure Progress Review 2023, March 2023, https://nic.org.uk/app/uploads/IPR-2023-Final.pdf
93 National Audit Office, Regenerating the English Regions: Regional Development Agencies' support to physical regeneration projects, 30 March 2010, https://www.nao.org.uk/wp-content/uploads/2010/03/0910214.pdf
94 Henderson D, Dalton G, and Paun A, Trailblazer devolution deals, Institute for Government, 16 March 2023, https://www.instituteforgovernment.org.uk/explainer/trailblazer-devolution-deals
95 Johnson C, MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975, 1982, https://lburlamaqui.com.br/wp-content/uploads/2021/02/05_Johnson-C-1982.-MITI-and-the-Japanese-Miracle_-The-Growth-of-Industrial-Policy-1925-1975-.SUP.pdf

It is in line with global developments to accelerate industrial infrastructure development - as seen with the Biden Administration in the United States, which has sought to bring federal agencies closer together to accelerate approval and development of vital industrial infrastructure through institutions such as the Permitting Council.[96] At a time when our competitors are centralising their focus on industrial infrastructure, we should not be fragmenting it.

NIDA should also work closely with DSIT through the creation of a Technology Superpower Infrastructure Council (TSIC) that can help to bring together industrial infrastructure leaders, technology businesses and investors to ensure that the needs of our frontier sectors are properly understood.

By providing a single focal point for government policy and delivery of infrastructure, NIDA would help to break through many of the challenges facing the development of new projects, particularly around slow and fragmented decision making whilst giving confidence to businesses and investors.

The creation of a Super-Agency like NIDA would not, in itself, resolve all the problems that the UK faces. Reforms to the planning system and providing incentives for businesses to invest are also of critical importance. However, it would begin a new phase of development of the UK's industrial infrastructure and create a powerful agency to break through the inertia and bottlenecks hampering our economy.

3. CREATE A PRESUMPTION IN FAVOUR OF INDUSTRIAL INFRASTRUCTURE WITHIN THE NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

There is a consensus that the current planning system does not work effectively. Businesses we spoke to told us that there is a high level of uncertainty in the system and this in turn creates huge costs for business. It has also frustrated the ambitions of policy makers over decades that have sought to encourage investment from the private sector into the economy, particularly in industrial infrastructure where the UK has lagged behind our competitors.

Unfortunately, much of the debate is taken up by arguments about housing rather than considering broader issues, such as industrial infrastructure.

The NPPF lays out planning policies for England and how they should be applied.[97] Although the NPPF does not address 'nationally significant infrastructure projects', it does affect many of the decisions made about industrial infrastructure that we have outlined in this report, including logistics, data storage, laboratories and light industrial space. The NPPF has a critical role in supporting the many thousands of smaller, but collectively significant, industrial infrastructure projects that the UK needs to develop in order to be a technological superpower.

The NPPF does ask for local authorities to ensure that they put in place Local Plans for their areas that include adequate infrastructure and support Local Industrial Strategies. However, this is often not delivered in practice because it is overridden by other priorities. This creates uncertainty and encourages 'free-riding', whereby areas seek to pass off industrial infrastructure - particularly logistics - to other areas in the hope that they will avoid confronting local residents with unpopular, but necessary, developments.

The British Property Federation has called for the NPPF to be changed to create a presumption in favour of logistics development where certain conditions are met - in particular, ensuring that there is not unacceptable impact on residential amenities.[98] This is in line with the presumption in favour of sustainable development that is already in the NPPF. However, it also needs to be broader than just logistics taking into account the broader range of industrial infrastructure and the fact that in many cases logistics may be part of wider mixed-use sites that include other important industries.

The Government should immediately consult on the development of a presumption in favour of industrial infrastructure in collaboration with local authorities, businesses and investors so that a fair and reasonable set of presumptions are developed. At the heart of this presumption should be the need for local plans to consider the National Infrastructure Strategy and the needs of the UK economy for industrial infrastructure. The burden should be on local authorities, residents or other objectors to demonstrate how not allowing a

96 The White House, Biden-Harris Permitting Action Plan, 10 May 2022, https://www.whitehouse.gov/wp-content/uploads/2022/05/Biden-Harris-Permitting-Action-Plan.pdf
97 Department for Levelling Up, Housing and Communities, National Planning Policy Framework, September 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf
98 BPF, Employment Land Manifesto, July 2021, https://bpf.org.uk/media/4313/bpf-employment-land-manifesto.pdf

development to take place will avoid significant harm to the economy and meet the UK's stated economic, social and environmental objectives.

This presumption would also counter the deficiencies in the current planning system, which is backward looking, does not take into account the regional profile of industrial infrastructure and is focused on housing development rather than other forms of building.[99]

A presumption of this kind would give a clear signal to businesses and investors that sustainable development is welcome whilst also empowering planning authorities (potentially in partnership with NIDA) to accelerate decisions on industrial infrastructure.

This presumption could also provide the basis for long term planning reform, for example, through the development of a zonal approach to planning. This would allow for developments that fit within a particular zone (e.g. an industrial zone) to be given swift permission and give clarity to developers about what sort of development will be allowed in the future.[100] While Simplified Planning Zones have been helpful so far, they have not been used widely used and lack a clear framework for implementation. A zonal approach with a clear framework, building on best practice, would allow these to be implemented easier and more effectively. That being said, it is important that industrial infrastructure is not consigned purely to the periphery of urban areas. Planning must take into account the development of e-commerce and the need for technology-intensive businesses to gain access to talent in urban areas.

Planning reform must be at the core of reviving the UK's industrial infrastructure and creating the platform for the UK to become a technology superpower. Policy makers must ensure that industrial infrastructure developers and providers are given a seat around the table and that the debate around planning is not exclusively concerned with housing. Planning reform that provides for the development of housing without providing the jobs for residents will fail to deliver on the public's aspirations.

4. INCREASE AND RING-FENCE SPENDING ON LOCAL AUTHORITY PLANNING TEAMS WITH CENTRAL GOVERNMENT INVESTMENT OVER TEN YEARS

The lack of capacity in the local planning teams has been well documented. Since local authority budgets were cut from 2010, planning budgets have often been the first to be cut. This has left teams under-resourced and unable to take swift decisions. Moreover, given the documented challenges in getting local authorities to approve planning permission for industrial infrastructure - which can be controversial - there is little incentive for local authorities to increase investment for planning teams to make decisions.

The government had consulted on increasing planning fees and ring-fencing that money for planning authorities.[101] However, it decided that these decisions were best left to local authorities. This is a disappointing decision and flies in the face of the consultation responses, where 88% of respondents agreed with ring fencing fees for planning teams.[102] The fact that fees for planning applications will increase by up to 35%, with no guarantees that this money will be used to increase planning capacity, is deeply concerning.

The government needs to reconsider this decision. It should protect local authority planning department budgets so that businesses and developers are able to get decisions in a reasonable period of time. We welcome the decision at the Autumn Statement to introduce a premium planning service which would enable companies to accelerate planning decisions for higher fees.[103] However, this is not a sustainable solution to the lack of investment in planning departments. Ring-fencing the funding from fees is needed to ensure that local authorities have the funding and resources to carry out their functions. Given that many of the difficulties facing local authorities are due to cuts in central government grant funding, this would not be an unreasonable ask.

99 Savills, Levelling Up - The Logic of Logistics, 22 April 2022, https://www.savills.co.uk/research_articles/229130/326244-0
100 Breach A, A very short guide to planning reform, Centre for Cities, 1 December 2020, https://www.centreforcities.org/publication/a-very-short-guide-to-planning-reform/
101 Department for Levelling Up, Housing & Communities, Technical consultation: Stronger performance of local planning authorities supported through an increase in planning fees: government response, 25 July 2023, https://www.gov.uk/government/consultations/increasing-planning-fees-and-performance-technical-consultation/outcome/technical-consultation-stronger-performance-of-local-planning-authorities-supported-through-an-increase-in-planning-fees-government-response
102 Ibid.
103 HM Treasury, Autumn Statement 2023, November 2023, https://assets.publishing.service.gov.uk/media/655e107697196d000d985d6b/E02982473_Autumn_Statement_Nov_23_Accessible_v3.pdf

As with the proposed premium planning service, these should be linked to clear targets on the time taken to make decisions and action plans. Central government should also consider putting additional investment for local authorities to develop infrastructure specialists within planning teams. These specialists could focus on decisions around industrial infrastructure proposals, which can be more complicated than other planning decisions.

5. CREATE A "PRIORITY POWER ACCESS PLAN" FOR ACCESS TO THE NATIONAL GRID

Delays and uncertainty about access to electricity is one of the biggest barriers to growing our industrial infrastructure. Given the intensive use of electricity within frontier technologies such as robotics and artificial intelligence, as well as the need to electrify our transport fleets, we must address the "power problem" urgently.

Our current first-come-first-serve system for deciding which businesses or developments should be connected to the grid is a recipe for disaster. Not only does it encourage actors to game the system by putting themselves forward for connection when they know that there is a realistic chance it will not be needed but, as noted by National Grid and Ofgem, it does not consider the strategic needs of the country. In theory, it is possible in the current system for a theme park to get electricity access ahead of a critical regional distribution depot. There may be arguments in favour of the former over the latter, but at present this is not a conversation that is currently taking place. Capacity will not be abundant for some time - the transition to doubling the grid may take another fifty years based on the current rate of progress. This means prioritisation is essential.

We recommend that a Priority Power Access Strategy (PPAP) is developed by National Grid Electricity System Operator (ESO), in consultation with Ofgem, the Department for Energy Security and Net Zero and businesses. This would be a points-based system, weighted to align with the objectives outlined in the UK Government's National Infrastructure Strategy, Science and Technology Framework and Plan for Growth. Places in the Grid's queuing system would be awarded on the basis of the points scored, with those receiving the highest points getting priority over those with the lowest points. Industrial infrastructure, given the UK's lack of facilities and need to catch up investment, should be given a preference. A points-based system would provide confidence to investors and businesses developing industrial infrastructure. It would provide assurance that, if their plans meet certain criteria around having significant positive spillover effects for the UK, they should be able to get access to the power they need as quickly as possible.

This is in line with announcements made at the Autumn Statement where the Department for Energy Security and Net Zero and Ofgem have promised to "move away from first come, first serve" and work with the Office for Investment to "triage [the] process to ensure the most strategically important projects receive the strongest possible support to explore timely connection solutions."[104]

Although the overall objective should be to develop the UK's electricity generation capabilities and grid capacity to be able to meet all our needs, we cannot let that aspiration divert us from the challenges of businesses in the short to medium term. We must avoid a situation where our industrial infrastructure is neglected because we are not prepared to make hard choices and prioritise our long-term needs.

6. EXTEND 'INVESTMENT ZONE' STRUCTURES AND BUILDINGS ALLOWANCE RULES TO COVER THE WHOLE OF THE UK

Our survey found that the UK's tax regime was seen as one of the biggest weaknesses in the UK's operating environment for business. We also found considerable support for tax reliefs that would encourage businesses to invest in the development and upgrading of existing industrial infrastructure.

In 2018, the government introduced the Structures and Buildings Allowance (SBA), which would allow businesses to claim tax deductions on qualifying expenditures in non-residential buildings and structures. This was a welcome development, providing tax relief for investments that previously would not have qualified for capital allowances. However, the relief is unusual given the long term nature of the claims. Relief is provided on a "straight-line" basis - meaning it takes around 33 years for the full expenditure to be offset and if the

104 Department for Energy Security and Net Zero and Ofgem, Connections Action Plan: Speeding up connections to the electricity network across Great Britain, November 2023, https://assets.publishing.service.gov.uk/media/655dd873d03a8d001207fe56/connections-action-plan.pdf

business misses a claim one year, it cannot be carried forward into the next year.

For Investment Zones, the government decided to accelerate claims for SBAs so that expenditure could be offset within 10 years, rather than 33 years. The aim was to create another incentive for businesses to put their projects in investment zones. However, given the scale of the industrial infrastructure required within the UK over the next several decades, it does not make sense to limit the enhanced SBAs to investment zones. We need industrial infrastructure to be built in every part of the country. Moreover, there are a number of other enhanced reliefs available to Investment Zones which still set them apart from other areas and give businesses an incentive to locate in them.

This change would be of considerable benefit to businesses in the medium-term and accelerate the deployment of resources for future investment. For example, for qualifying £10m investments, in the ten years after the initial investment took place, businesses would be £700,000 a year better off. This is a resource that can be reinvested back into the development of new infrastructure or other technological improvements.

As industrial infrastructure investments take years to pay-off, incurring significant risks to those undertaking the investments, we should be *accelerating* the drawing down of tax reliefs. The current rules for the SBA are therefore the opposite of the need for industrial infrastructure developers. There is also a risk that, given the pace of technological developments, stretching tax reliefs over a long period of time encourages businesses to hold off investment. In order to maximise the value of tax reliefs, businesses may seek to ensure that the changes they make are a 'one-off', instead of a more iterative approach that recognises the technological uncertainty and risk that is inherent in a period of technological transition.

Taking an 'Investment Zone' approach to the whole of the country is essential if we are to develop the industrial infrastructure required for the UK to become a technological superpower.

5. THE REWARDS FOR TRANSITIONING TO A TECHNOLOGICAL SUPERPOWER

The rewards for becoming a technological superpower are huge for the UK and any country that can achieve it.

The direct economic opportunity is significant. Advanced robotics is forecast to add $4.9 trillion to the global economy every year by 2030.[105] Estimates of the impact of robotics and autonomous systems suggest that this could be worth £200bn to the UK economy - raising manufacturing sector productivity by up to 22% and generating a long-term employment increase of up to 7%.[106] The use of drones could add £45bn to the UK economy by 2030, with the connectedness to communities adding £10bn to GDP alone.[107] Accelerating the deployment of new technologies such as connected and autonomous vehicles in the freight system could reduce the cost by £26 billion - equivalent to around 1.3% of GDP - unlocking resources for more productive investment.[108]

Public First's research has found that Artificial Intelligence (AI) alone could create £400bn in value for the UK economy by 2030.[109] In part driving this, generative AI could boost the UK's productivity by up to 0.6% if we are able to become one of the fastest adapting economies.[110] To put this into context, the UK's overall productivity growth between 2022 and 2023 has been around 0.3%.[111]

105 Department for Business, Energy & Industrial Strategy, Economic impact of robotics and autonomous systems, November 2021, https://assets.publishing.service.gov.uk/media/6193996bd3bf7f055b293381/ras-final-report-nov-2021.pdf
106 Ibid.
107 HM Government, Advancing airborne autonomy: Commercial drones saving money and saving lives in the UK, 18 July 2022, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1091358/drone-ambition-statement.pdf
108 National Infrastructure Commission, The value of freight, April 2019, https://nic.org.uk/app/uploads/Future-of-Freight_The-Value-of-Freight_Vivid-Economics.pdf
109 Public First, Google's Economic Impact in the UK, July 2023, https://kstatic.googleusercontent.com/files/3b26a4852a311281ca84da75d9b3617197c5473d68317e8b492de69a9494dcc0a2d17421e8dfe9c3a84ff0742bc2aad745fb792d745b26543e814ae1cd3541ab
110 McKinsey, The economic potential of generative AI: The next productivity frontier, 14 June 2023, https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-economic-potential-of-generative-ai-the-next-productivity-frontier
111 Harari D, Productivity: Key Economic Indicators, House of Commons Library, 24 November 2023, https://commonslibrary.parliament.uk/research-briefings/sn02791/

Underpinning all this is the need for high-quality industrial infrastructure, which has been critical to technological transitions in the past and will be in the future.

The UK also has the opportunity to experience a 'double dividend' from infrastructure investment, as this will not only enable the UK to make a success of the emerging technological revolution but will create millions of jobs in its own right.

As outlined in Table 2, meeting suppressed demand for one part of the UK's industrial infrastructure - logistics - could add £68bn in Gross Value Added to the UK economy. This is equivalent to 3% of UK economic output and would generate 1.1m jobs.[112] This is also likely to be an underestimate. The rapidly increasing demand for logistics - as people demand faster access to goods and digital technology accelerates purchasing decisions - mean the suppressed demand could increase further.

TABLE 2

ECONOMIC CONTRIBUTION OF UNLOCKING SUPPRESSED DEMAND FOR INDUSTRIAL AND LOGISTICS SECTOR

	FOOTPRINT	JOBS	GVA
Current	34 million square feet	3,800,000	£232bn
Meeting suppressed demand	44 million square feet	4,900,000	£300bn
Net gain	**10 million square feet**	**1,100,000**	**£68bn**

Source: Savills & Demos analysis

If policy makers wish to unlock the benefits of accelerating the development of our industrial infrastructure, they need to take steps to ensure that businesses have the certainty and incentives to invest for the future.

As noted in the introduction of this report, higher levels of technological adoption will lead to higher levels of productivity, better jobs and better living standards over the long run. However, the UK's technological potential is currently being crushed under a lack of appropriate industrial infrastructure. Developing new technologies is only half the battle. The decisive half is providing the facilities for businesses to implement them. Britain failed to do this in the latter years of the 19th Century and early 20th Century because we lacked the industrial infrastructure to maintain our technological superiority.

The UK cannot risk falling behind again. If we want to unshackle the superpower, we need to address the barriers to developing the industrial infrastructure we need. This research is a call to action for policy makers to put in place the long term policies in place to grow our industrial infrastructure.

112 Demos calculations based on Savills data. Savills, Levelling Up - The Logic of Logistics, 22 April 2022, https://www.savills.co.uk/research_articles/229130/326244-0

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At a crossroads in Britain's history, we need ideas for renewal, reconnection and the restoration of hope. Challenges from populism to climate change remain unsolved, and a technological revolution dawns, but the centre of politics has been intellectually paralysed. Demos will change that. We can counter the impossible promises of the political extremes, and challenge despair – by bringing to life an aspirational narrative about the future of Britain that is rooted in the hopes and ambitions of people from across our country.

Demos is an independent, educational charity, registered in England and Wales. (Charity Registration no. 1042046)

Find out more at **www.demos.co.uk**

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15 WHITEHALL, LONDON, SW1A 2DD
T: 020 3878 3955
HELLO@DEMOS.CO.UK
WWW.DEMOS.CO.UK