

colt

Supporting AI in the UK: a whitepaper to Government

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Executive summary

The transformative potential of AI represents one of the most significant economic opportunities of our time. Studies project that AI could support an additional 10 million jobs in the UK, adding £320 billion (\$400 billion) to the UK economy each year.¹ As such, AI is seen as a critical component of the Government's growth strategy, supporting the delivery of both the industrial and infrastructure strategy, addressing the productivity puzzle and driving efficiencies in the public sector.

The race to lead in AI is a high-stakes competition. Countries such as the US and China are investing significantly, having had £54 billion and £6 billion of private investment in 2023 respectively, compared to the UK's £3 billion.² Though the UK has a strong foundation in AI, falling behind in this race would threaten national competitiveness, job creation and industrial resilience.

Recognising this urgency, the recently published AI Opportunities Action Plan reflects the Government's commitment and ambition to prioritise AI as a key driver of UK economic growth.³ Colt supports this strategy and emphasises the need for bold action to address critical structural challenges, unlock AI's transformative power and position the UK as a global leader in the industry.

As a trusted digital infrastructure leader, Colt will collaborate with the Government and industry stakeholder to offer a global perspective on the challenges to AI growth and adoption in the UK. With expertise in business connectivity and data centres, Colt can offer critical insights into AI connectivity requirements, data centre modernisation, and the planning needed for infrastructure expansion.

To help the Government realise the ambitions of the AI Opportunities Action Plan, Colt has identified five key recommendations where its expertise can directly contribute to effective implementation:

- **Recommendation 1: Set out, within 6 months, a long-term plan for the UK's AI infrastructure needs, backed by a 10-year investment commitment.** As the largest business-to-business fibre infrastructure provider in Europe, Colt has unrivalled experience building the kinds of digital infrastructure required to unlock AI's potential in the UK. To turbocharge this, Colt calls for a streamlined planning process for critical AI infrastructure, while offering the Government its knowledge and expertise to advise on the digital connectivity deployment and data centre modernisation needed to safeguard the UK's competitive advantage in the global AI race.
- **Recommendation 4: Establish AI Growth Zones (AIGZs) to accelerate the build-out of AI data centres.** With the largest footprint of connected data centres across Europe and Asia, Colt has a comprehensive view of the optimal sites and conditions for digital infrastructure installation. Considering this, Colt strongly advocates for strategically locating the AIGZs in regions rich in renewable energy, robust communications infrastructure, and with a strong potential for regional economic growth. Leveraging its expertise, Colt can play a pivotal role in helping identify and develop AIGZs in places that will attract further private investment into the UK.
- **Recommendation 5: Mitigate the sustainability and security risks of AI infrastructure, while positioning the UK to take advantage of opportunities to provide solutions.** Colt is on a journey to build a leaner, more energy-efficient global network. With its expertise in modernising digital infrastructure and commitment to net-zero emissions, Colt is ideally positioned to help the Government explore a wide range of sustainability solutions for AI infrastructure, from reforming power-purchase agreements (PPAs), to identifying key energy efficiency investments, or capturing waste heat from data centres to serve district heating networks.
- **Recommendation 6: Agree international compute partnerships with like-minded countries to increase the types of compute capability available to researchers and catalyse research collaborations.** Through its partnership with Lumen Technologies, Colt offers unmatched global connectivity via the world's No.1 Autonomous System (AS). This advanced infrastructure, including high-capacity IP transit ports in the major European hubs, enables faster, more reliable access to the global networks needed to forge international compute partnerships and drive AI innovation through strengthened cross-border research collaborations.

- **Recommendation 50:** Create a new unit, UK Sovereign AI, with the power to partner with the private sector to deliver the clear mandate of maximising the UK's stake in frontier AI. As a major digital infrastructure investor and trusted partner to governments and online hyper-scalers around the world, Colt brings extensive experience collaborating with public stakeholders to unlock private capital. To support the mission of UK Sovereign AI, Colt recommends establishing a central authority to foster alignment between Local Government policies and national AI goals. Colt can support this authority by providing actionable insights into the development of scalable, sustainable, and secure AI infrastructure across the UK.

Colt believes the Government can make significant progress on its AI Opportunities Action Plan using the **fiscally neutral tools and powers already at its disposal**. By facilitating critical infrastructure upgrades, fostering a supportive regulatory environment, leveraging regional strengths, and cultivating a highly skilled workforce, the Government can deliver tangible outcomes that will strengthen the AI ecosystem, promote adoption across sectors, and position the UK as a global innovation leader. We identify four key roles the Government should embrace to achieve this:

1	Shape a supportive environment	Establish robust, pro-innovation regulation and a streamlined planning processes to create a stable policy environment for AI .
2	Cross sector co-ordination	Act as a unifying force by harmonising policies, identifying synergies, and addressing varying sectoral requirements.
3	Strategic leadership and vision	Champion AI adoption, identify sectoral opportunities, and showcase public sector best practices to build confidence in AI.
4	Flexible funding support	Leverage fiscal tools, targeted R&D funding, and flexible mechanisms to unlock private investment and drive innovation.

This report outlines specific recommendations under each of these roles, which complement the AI Opportunities Plan. To drive the plan forward, we propose a **2025 roundtable** bringing together key players to shape the UK's AI roadmap. Colt is also ready to engage in strategic talks with the Government and participate in Select Committee hearings where relevant, to further contribute to the development and implementation of the AI Action Plan.

We are at a pivotal juncture in the global race for AI. To capitalise on this opportunity, Government must provide strategic leadership to ensure the UK's AI ecosystem remains competitive on the world stage. Crucially, this does not need to mean increased public funding, but rather a commitment to holistic policies and a strategic approach that will enable private investment to unlock the transformative potential of AI across the UK.

About Colt

Established in 1992 as City of London Telecommunications, Colt is now a London-based multinational specialising in high-performance network and voice services for businesses across Europe, Asia, and the United States.

As the largest pure business-to-business fibre infrastructure provider in Europe, Colt has invested heavily in its state-of-the-art 400Gbps optical fibre infrastructure, providing increased capacity and connectivity where it is needed most.

Today, Colt provides connectivity to major data centres operators around the world, supporting the digital transformation of enterprise with its extensive, high-capacity network.

1. Why prioritise policy for AI?

The size of the AI prize

The transformative potential of AI represents one of the most significant economic opportunities of our time. Studies such as EY and Liberty Global's "Wired for AI" project found that AI could support an additional 10 million jobs in the UK, adding £320 billion (\$400 billion) annually to the UK economy.⁴ Additionally, Microsoft and Public First project £17 billion in productivity gains for the UK public sector alone over the same period.⁵

Yet these figures only scratch the surface. As a **general-purpose technology**, one that drives innovation in all sectors, AI's total impact could exceed forecasts, allowing progression in sectors key to the UK's future Industrial Strategy and Net Zero targets, such as clean energy, life sciences, healthcare and advanced manufacturing.

AI is uniquely positioned to **address many of the UK's structural challenges**. It can be the key to solving the UK's long-standing productivity puzzle, stimulating business investment and creating demand for entirely new markets. AI's ability to enhance decision-making and automate complex processes has the potential to transform both public and private sector efficiency, enabling faster, data-driven decisions and reducing operational costs.

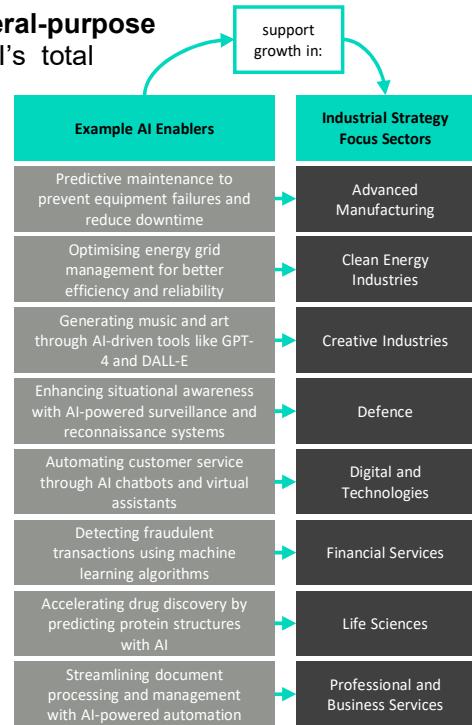
Additionally, the **regulatory freedom of being outside the EU's AI Act** allows the UK more flexibility in AI research, development and use and other aspects of AI innovation compared to countries within the EU. This helps magnify the UK's core strengths, such as its world-class R&D, financial and professional services and thriving creative industries, solidifying the nation's position as a global leader in technology and economic competitiveness.

Investing in AI also **supports broader societal benefits**, from improving public health through AI-driven medical research to enabling the net zero transition via smart grid optimisation and sustainable supply chains. As outlined in the Government's modern Industrial Strategy, AI will be pivotal to achieving economic diversification, accelerating sectoral growth and unlocking synergies between competing priorities like economic growth and environmental sustainability.

In short, prioritising AI is not merely **about staying competitive in a global race**, it is about redefining the UK's economic future, driving innovation and delivering tangible benefits for businesses, citizens and society as a whole.

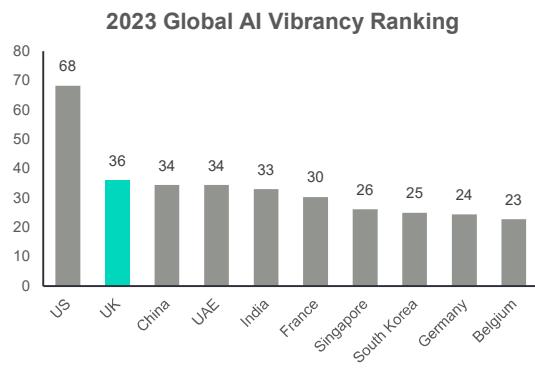
Risks if the UK misses out

The race to lead in AI is not just an opportunity, it is a **high-stakes competition that the UK cannot afford to lose**. Failure to act decisively and fast, risks relegating the UK to a secondary player in the global AI economy, with far-reaching consequences for national competitiveness, job creation and industrial resilience. Given the speed at which AI is evolving and with Quantum AI already here as demonstrated by advancements from companies like Google,⁶ the rate of change will only escalate and the risk of falling further behind is growing. Immediate action is needed to capture the emerging



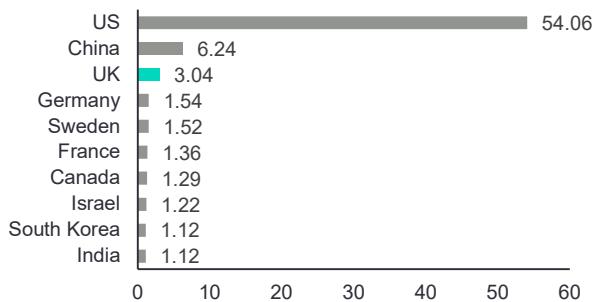
near-term opportunities; while long-term strategic thinking lays the groundwork for the coordinated effort that is essential to harnesses AI's full transformative potential over the next 10 years.

Countries such as the US and China are outpacing the UK with staggering AI investments, £54 billion and £6 billion, respectively, in 2023 alone, compared to the UK's £3 billion (see chart, right).⁷ The U.S. also leads in terms of total number of newly funded AI companies, seeing 1.9 times more than the European Union and the United Kingdom combined and 3.4 times more than China⁸.



Source: Stanford University Global AI Vibrancy index, assuming equalised weights across vibrancy 'pillars' (see endnotes).

Private investment in AI by geographic area, 2023 (£ Billions)



These nations are **leveraging their scientific, industrial and financial muscle** to dominate AI development, from cutting-edge research to commercialisation at scale, and in doing so are setting global standards that risk marginalising UK industries.

While the UK holds a strong position, ranking second globally in Stanford University's AI Vibrancy Rankings (see chart, left),⁹ its lead over other nations is narrow. Underinvestment threatens to erode this, **leaving UK business less competitive** in terms of innovation and productivity.

Furthermore, the UK would lose its **influence in shaping global AI regulations and safety standards**, leaving British firms as 'change takers', adapting to the rules set by others..

The repercussions of **losing ground in AI extend beyond technology sectors**. A weakened AI position could reduce UK export competitiveness, as nations with superior AI adoption and diffusion achieve cost reductions and productivity gains that outpace UK industries. Sectors such as manufacturing, finance and life sciences risk falling behind, with diminished global market share leading to reduced economic growth and job opportunities. The impact of AI is not exclusively about tool and model development; it also hinges on effective deployment and integration of AI technologies across various industries to maintain a competitive edge.

The UK's lagging business investment, highlighted in Invest 2035,¹⁰ underscores this vulnerability: the UK ranks among the lowest in the G7 for investment as a share of GDP, with nearly 40% of firms avoiding investment entirely in any given year. **To augment AI effectively, this will require step change business investment**, otherwise industries risk losing their price competitiveness, resulting in job losses and economic contraction.

The message is clear: Government must act fast and decisively to implement the recommendations of the AI Opportunities Action Plan. This is crucial to secure the UK's place as a global leader in this transformative technology. Achieving this means tackling structural issues in digital and physical infrastructure, investment and workforce readiness. Inaction is not an option in a race where the stakes grow higher by the day.

2. What hampers AI growth in the UK?

Advancements in AI depend on a multifaceted industry of investors, developers, infrastructure operators, manufacturers and users. This international network is vital for fostering innovation and integrating AI technologies at all levels of the value chain, across all industrial sectors. However, the cross-sectoral nature of AI also adds significant complexity, which in turn presents a range of different barriers (and opportunities) that need Central Government attention. Addressing these issues is vital to ensure the UK remains at the forefront of AI innovation and can fully reap its benefits.

Issue 1: Compute and connect

The **demand for compute capacity** for AI research has grown significantly (doubling every three-and-a-half months since 2012) and is expected to continue increasing.¹¹ A long-term programme of investment is required to support the scaling up of compute provision, data consolidation and data facilities needed to service this demand. Currently, the UK's general compute capacity is lower than comparators like France, Germany, Japan and the United States; and it significantly lags in the GPU compute capacity that is critical for modern AI training and inference—behind the United States and China that dominate global AI chip power.¹² According to the Independent Review of Future Compute in November 2022 (the most recent available), the UK did not have a supercomputer system in the top 25 of Top 500 global systems¹³ and had only a 1.3% share of the global compute capacity.¹⁴ The review also made Britain the first country to take stock of its compute capacity in a holistic manner, setting a target to build a full exascale-capacity supercomputer by 2026 and plan for 3,000 AI accelerators as part of a National AI Research resource. However, given the pace of AI innovation, even these ambitions may prove insufficient. The announcement by the UK Government to spend £100m on 5,000 GPUs¹⁵ pales in comparison to the \$10.5bn Meta is spending on around 50,000 Nvidia H100 GPUs¹⁶, demonstrating the vast disparity in investment and resources between the UK and leading global tech firms. All of this demonstrates the urgent need for the UK to significantly increase its investment in AI infrastructure to remain competitive on the global stage.

The UK must address several key **issues around digital infrastructure** to promote growth in the AI sector. Continued investment in linking computing resources, data storage facilities and end-users is essential. The UK must continue to enhance its core, transit and access networks if these are to remain fit to support the growth of AI. Core networks are essential for connecting major data centre and compute facilities, ensuring robust and high-capacity data transfer. Data centres, already recognised as part of the UK's critical national infrastructure, play a vital role in supporting the digital economy and must be prioritised as providers of essential services. Transit networks need improvement to facilitate the movement of data between different regions and countries, supporting national and international collaboration and data sharing. Additionally, access networks, such as high-speed internet and 5G, must be expanded to provide end-users and edge devices with the necessary connectivity for real-time data access and processing. For the UK to remain competitive in AI it is essential that the planning reforms, regulatory support, energy access, physical security, and capacity growth required by the UK's digital infrastructure providers are addressed. Only then, can they fulfil their role in providing resilience to this critical national infrastructure.

Furthermore, with growing data centre capacity in Nordic countries, the UK is fast becoming a crucial hub for data transit across Europe. However, **this position is at risk if the UK does not act quickly enough to enhance its infrastructure**. New cables arriving in Northern England will increase demand for data centres and put additional pressure on the UK's backhaul network. This network, which transports data from subsea cable landing stations to data centres, requires significant upgrades, particularly on key routes linking the north and south of the UK. Likewise, the IOEMA cable system is expected to land in an East Anglia location that is not yet fully served with fibre connectivity. Enhanced high-capacity routes, increased availability of ducts and dark fibre are critical to maintaining the UK's competitiveness and avoiding the risk of being bypassed as a key connector for European data transit.

Case Study: Colt's global connectivity solutions

Colt partners with Lumen Technologies to jointly operate AS3356, the No.1 autonomous system cone globally according to BGP Tools, and the 6th largest in terms of known peers. Recent investments include 400 Gigabit per second IP Transit ports across the key FLAP route (Frankfurt, London, Amsterdam, and Paris). These advancements provide UK businesses with unparalleled access to the global internet backbone, enabling faster connectivity and supporting the development of emerging technologies like AI.

Issue 2: Data centre capacity and efficiency

The increasing adoption of AI is intrinsically tied to the availability of additional compute and data centre capacity. The UK's ambitions to enhance productivity and drive greater AI adoption will further accelerate demand for advanced data centre capacity. McKinsey estimates that global demand for data centre capacity will continue to increase by around 20% year-on-year from now to 2030, reaching an annual demand of between 171 and 219 gigawatts (GW), compared to current demand of 60 GW.¹⁷ Hyperscalers such as Google, have warned that Britain risks falling behind in the global AI race unless the Government accelerates data centre construction.¹⁸

The exponential acceleration of AI use places increasing pressure to build enough modern and efficient data centre capacity to meet the growing demand. The data centres needed for AI differ fundamentally from those designed for traditional cloud or data processing. AI workloads rely on advanced GPUs, which are heavier, consume more power and require different cooling, cabling and physical architecture than CPUs. This means specialised facilities with robust power and cooling systems, stronger building foundations and reimagined designs for high-density compute environments. Consequently, **much of the UK's existing data centre infrastructure is ill-suited to modern AI demands.** While retrofitting traditional data centres is possible, the complexity and cost involved often make building new AI-focused facilities a more efficient and effective solution.

As the UK increases its data centre capacity, **addressing efficiency and sustainability challenges** is critical. According to the Royal Institution of Chartered Surveyors (RICS), cooling accounts for around 40% of a data centre's total power consumption (and related carbon emissions).¹⁹ Traditional air-cooling solutions are often insufficient, necessitating a shift to liquid-to-liquid cooling systems. However, liquid cooling systems require a modern data centre design. With many of the UK's data centres now starting to age, there is a growing urgency to upgrade these to enhance their energy efficiency, sustainability, capacity, performance and reliability ensuring they can meet the growing demands of AI and digital services.

A key constraint on constructing new, advanced data centres is **planning regulations**. Integrating the provision of AI-capable data centres into national and regional infrastructure plans is essential to meet broader economic objectives. The UK must create an environment conducive to AI growth, identifying suitable and sustainable locations for data centres. Sensible local planning is also required to balance data centre growth with other infrastructure challenges. Recent Government interventions, such as the Housing Secretary's involvement in planning applications highlight the need for such a coordinated approach.²⁰

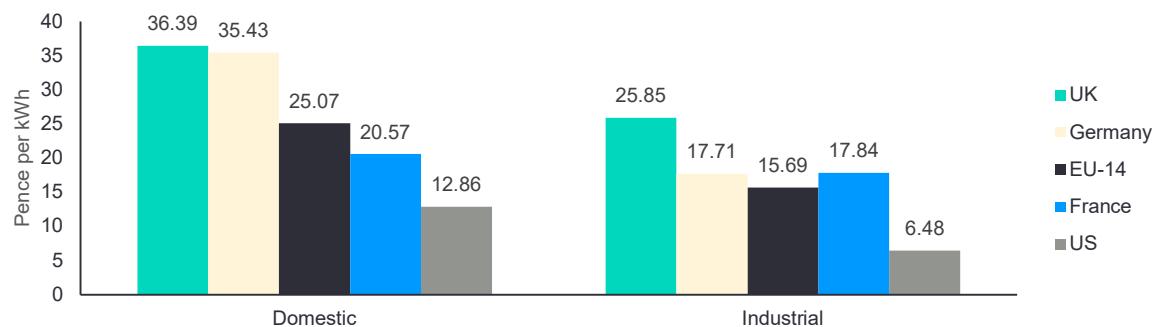
Issue 3: Energy supply

Data centres and advanced AI processing are **energy-intensive operations**, accounting for around 2% of Britain's total electricity demand according to the National Energy System Operator – a figure that is projected to quadruple by 2030.²¹ This increasing energy consumption exacerbates challenges for the UK's net-zero ambitions, as ensuring a sufficient supply of low-carbon energy is already a considerable hurdle. Operators face difficulties securing reliable and affordable access to energy, which is essential if the sector is to meet its sustainability targets. A recent example from Ireland, where data centres already account for 18.5% of total electricity demand, serves as a

warning of the risks. In April 2024, Amazon Web Services (AWS) was forced to periodically restrict the number of resources users could access in Ireland amid ongoing concerns about the amount of power consumed by the nation's data centres.²²

The **high cost of electricity in the UK** further amplifies these pressures, making the country less attractive compared to those with more affordable energy prices.²³ Figure 1 shows how UK power prices compare to the established EU and US markets, while competition is also intensifying from emerging hubs for international data centres, such as Saudi Arabia and the Middle East. These financial and sustainability concerns, risk deterring investment in the sector, which could limit the UK's ability to capitalise on AI advancements and drive economic growth.

Figure 1: Domestic and international electricity prices (2023)



Source: UK Government - Department of Energy Security & Net Zero (DESNZ). EU-14 averages exclude Denmark and Netherlands for industrial prices and Denmark for domestic prices due to data unavailability

Grid infrastructure is recognised as a critical bottleneck for achieving the energy transition and national growth plans, as delays to connect new energy supply projects and industrial users can last up to 10 years.²⁴ This long lead time conflicts with the rapid pace at which data centre demand is growing, potentially stalling development plans for hyperscalers and existing operators. As data centres continue to cluster in high-demand regions like South-East England, grid congestion intensifies, posing risks to reliability and increasing costs for operators. In recognition of these issues the Government has recently set out its plans for reforming the grid connection process and delivering new network infrastructure to align with its strategic planning for its clean power by 2030 mission.²⁵ These infrastructure upgrades will be critical to the AI industry.

Facilitating critical infrastructure upgrades – including those to enable the unlocking of AI – will be a crucial step forward in driving economic growth across the country
- John Pettigrew, CEO of National Grid

Locational challenges further complicate the UK's ability to support data centre expansion. Proximity to major metropolitan areas is often a requirement for data centres to provide low-latency services to users, yet these densely populated regions typically lack the required grid infrastructure to make additional connections. Whilst regions such as Denmark²⁶ have implemented innovative approaches, including integrating waste heat from data centres into district heating networks, the UK has been slower to align data centre growth with energy system resilience. Additionally, the absence of streamlined regulatory processes and comprehensive incentives undermines efforts to optimise site selection and improve sustainability. If these challenges remain unaddressed, the UK risks falling behind in the race to attract data centre investments and drive technological innovation.

Issue 4: Investment

The availability of finance poses a significant barrier to the growth of the UK's AI sector. According to the Artificial Intelligence Sector Study 2023, access to equity investment and external finance were cited as short-term barriers to growth by 53% and 32% of respondents, respectively.²⁷ As the figures below make clear, UK investors remain predominantly focussed on early-stage seed and venture funding, with relatively few resources being used to support companies transitioning from to growth, establishment and even exit. To ensure the sector's development, targeted interventions are needed to bridge this funding gap and enable small and medium-sized enterprises (SMEs) to scale effectively.

Figure 2: Dedicated AI company stage of evolution

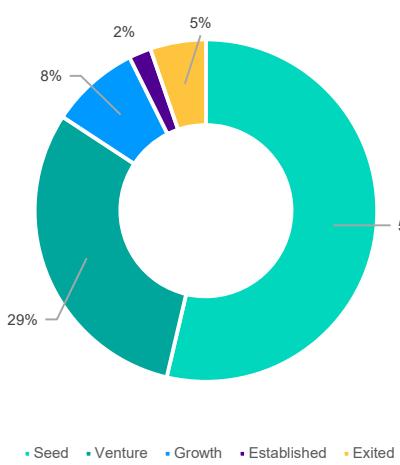
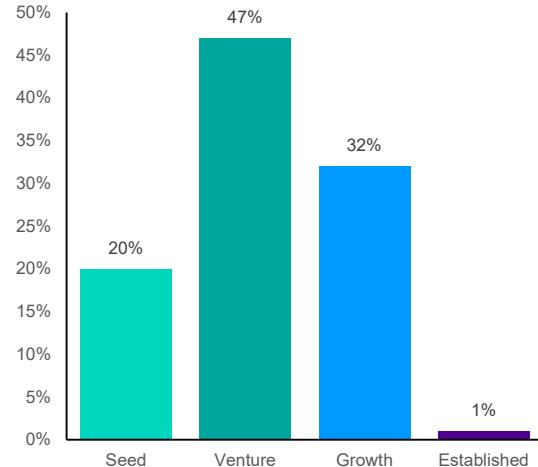


Figure 3: Share of funding by stage of evolution



The highly **competitive global landscape for AI investment** further challenges the UK's established position. While the UK remains a key player, attracting more than £3 billion in private AI investment in 2023 and ranking third globally, it lags behind China (with over £6 billion invested) and pales in comparison with the US (at more than £54 billion invested). The US dominates generative AI venture capital investment in particular, with a supportive funding ecosystem that encourages growth at all stages of development: of the £20+ billion invested in generative AI globally in 2023, 80% was in North America (predominantly the US).²⁸

AI investment in the UK is predominately clustered in London, which received over 70% (£822 million) of equity investment in 2023.²⁹ While London's dominance provides a strong foundation for attracting global capital, it exacerbates regional disparities, leaving many parts of the UK underfunded and unable to benefit fully from AI's transformative potential. This geographic imbalance limits the development of regional AI hubs, stifling innovation and economic growth outside of the capital. Without proactive measures to promote both national and regional access to finance in the UK, Britain risks losing its competitive edge in this transformative industry.

Issue 5: Regulatory environment

The unprecedented pace of change in AI development demands a regulatory approach that is both agile and adaptable. As with all nascent technologies, AI is evolving in ways that are difficult to predict, creating uncertainty about future applications and risks. Therefore, a flexible, principles-based regulatory framework is needed, allowing UK businesses to respond dynamically to AI advances in a safe and responsible manner. As outlined below, the EU's AI act has faced significant criticism from major AI providers such as like Mistral AI and Meta, who argue that its

stringent, rules-based framework for both "high-risk" and general-purpose AI is stifling innovation and imposing heavy compliance burdens.³⁰

For the UK to remain an attractive destination for investment, it is crucial to establish a stable, pro-investment regulatory environment. Large investors require a high degree of regulatory and fiscal certainty as they seek medium- to long-term returns from their investment decisions. To achieve this, the UK must ensure that AI regulations providing straightforward, principles-based frameworks that offer both stability and adaptability, while avoiding unnecessary complexity. Not only will this support the growth and adoption of AI, it will also help instil investor confidence for funding the infrastructure and innovation that is needed to secure UK's competitive edge in AI and other emerging technologies.

Effective AI regulation must also be tailored to address the differentiated challenges and opportunities found across different sectors. For example, AI's impact across disparate industries such as healthcare, finance and autonomous vehicles varies significantly, with each sector presenting unique societal and economic risks and opportunities. Labour's proposal for a more proactive regulatory approach, including legislation targeting the most powerful AI tools, is a critical step, but the Government must act now to develop bespoke, sector-specific policies that balance safety with innovation. For example, the establishment of a "Regulatory Innovation Office" should be fast-tracked to help accelerate the oversight of high-risk AI areas, ensuring that regulatory frameworks are not only responsive but proactive in addressing emerging risks and fostering continued innovation.

The particulars of AI technologies must also be taken into consideration with cross-sectoral competition regulation. The model of innovation in AI often incentivises firms to grow through acquisition, rather than organically. Adjacency efficiencies can be strong, with the merger of AI operators allowing the combining of datasets, highly skilled talent and capital-intensive infrastructure. Furthermore, the major benefits of AI come not from new, stand-alone tools, but from the widespread integration of AI features into the tools and services that people already use in their daily work and personal lives. Acknowledging this, the competition framework should strike a careful balance between enforcement and growth, taking a permissive view of mergers that can enhance efficiency and innovation, while scrutinising those that could limit opportunities for AI to scale. This approach will help ensure competition policy becomes a driving force that helps the UK remain a hub for AI innovation, rather than a drag on financing and investment.

At the same time, the Government should also adopt a similarly pragmatic approach to data protection. While the UK should not fundamentally deviate from the principles of the EU's GDPR (so as to not jeopardise data flows from the bloc), there is an opportunity to explore techniques such as data anonymisation to allow a wider use of personal data in the development of AI. The UK already has an effective model (developed by the Open Data Institute, founded by Tim Berners-Lee) in the Data Institutions,³² which collects data from different organisations while respecting data ownership and its responsible use. Extending the reach of Data institutions could offer several benefits in the context of the UK's AI ecosystem, such as:

- **Enhanced data management:** Data institutions can hold and manage data on behalf of organisations or individuals, ensuring that data is stored securely and used responsibly in the development of new AI models.
- **Improved insights:** By combining data from various sources, AI can provide valuable insights and services back to those who have contributed data.
- **Open data access:** Data institutions can create open data sets that anyone can access, use and share to further specific missions or causes.
- **Common data infrastructure:** They could enable a common data infrastructure for specific sectors (one example being Open Banking in the UK banking system).

Additionally, data institutions can play a crucial role in ensuring data sovereignty, where organisations retain control over how their data is accessed and used, depending on their preferences. This would help in fostering trust and encouraging more organisations to share their data, ultimately driving AI innovation and economic growth.

AI's cross-border nature necessitates a degree of global regulatory harmonisation to address risks that transcend national boundaries. Without aligned standards, there is a risk of 'forum shopping' for these global services by firms (particularly bad actors) seeking to reduce their compliance burden and a corresponding 'race to the bottom' for governments that seek to attract inward investment by minimising regulation. Such disparities in ethical standards or safety protocols could undermine public trust and lead to unintended consequences, such as the proliferation of biased algorithms or misuse of AI technologies, even with a strong domestic regulatory framework. The UK has an opportunity to lead efforts in establishing global norms and frameworks, leveraging its reputation as a trusted regulator. Aligning with international partners while retaining a focus on domestic priorities will be critical in ensuring that AI's development is both responsible and inclusive.

Case study: impact of the EU's AI Act on investment

The EU's AI Act came into force on 1 August 2024, with the goal of unlocking AI in Europe as the first comprehensive regulation on artificial intelligence.³¹ However, the legislation has faced significant backlash from many of the world's leading AI and digital technology companies, particularly around its lack of clarity and legal certainty.

Most notably, an open letter to EU policymakers – signed by 50 leading tech firms, including Meta and Spotify – warns that Europe risks falling further behind in global competitiveness and innovation as a result of the AI Act. The letter highlights how inconsistent rules across the region could mean the EU missing out on advanced model developments, emphasising the chilling effect that fragmented and unpredictable decision-making will have on growth through generative AI, which is forecasted to increase global GDP by 10% over the next decade.

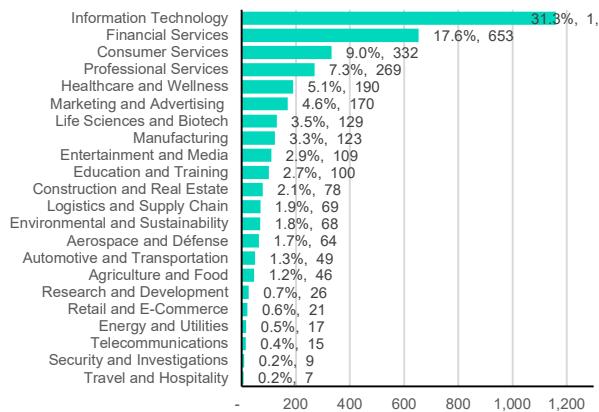
Furthermore, a recent (September 2024) report on the future of European competitiveness by Mario Draghi also explicitly cautions against the high levels of regulatory barriers facing the tech sector (including the EU AI Act), especially for smaller and newer companies trying to scale up. This again demonstrates how inefficient AI regulation could seriously constrain the EU's potential AI-driven growth that it is projected to unlock in the future.

Despite the EU AI Act representing a bold step towards the democratic oversight of AI, the broad scope, legal uncertainties and high compliance costs have resulted in reduced interest and investment in AI technologies in the EU. The industry's response to this framework strongly highlights the need for well-conceived and flexible AI regulation – adopting a principles-based approach that is more flexible and reactive to market and technology changes. Such a regulatory environment could unlock greater levels of AI innovation, without compromising governmental duties of maintaining safety and fairness for people and businesses.

Issue 6: Adoption and skills

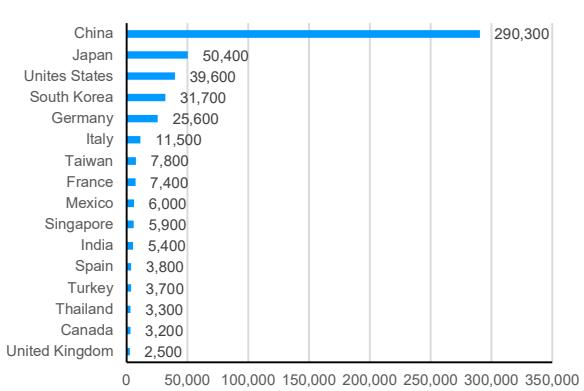
As shown in Figure 4 below, **AI adoption in the UK is currently concentrated in advanced industries such as financial and professional services, healthcare and life sciences**, leaving other sectors less engaged with its potential benefits. Despite the critical role of automation technologies in driving productivity, the UK lags significantly in physical automation. For instance, China's adoption of industrial robots drastically outpaces other nations, while the UK does not even rank among the top 15 countries in robot adoption, according to the International Federation of Robotics³³. Expanding AI integration across a broader range of industries will enhance productivity, spur innovation and ensure the benefits of AI are equitably distributed across the entire economy.

Figure 4: Instance of AI companies across sectors



Source: UK Government

Figure 5: Annual Installations of Industrial Robots



Source: World Robotics Report 2023

A shortage of technical skills within the workforce is one of the most pressing barriers to the adoption and growth of AI technologies in the UK. The Artificial Intelligence Sector Study 2023 found that 26% of respondents identified a lack of technical skills as a significant impediment to meeting business goals.³⁴ Challenges such as high salary demands for skilled professionals and limited access to talent further intensify this gap. Additionally, the UK's education system has been slow to adapt to the demands of emerging AI technologies, with businesses and academics highlighting a mismatch between industry requirements and educational output.

In addition to upskilling the domestic workforce, the UK must attract and retain international AI talent to remain competitive globally. Immigration policies must support the recruitment of specialists in machine learning, data science and related fields, addressing the shortages that cannot be met domestically. Countries like the US and Canada have successfully leveraged immigration to build thriving AI ecosystems, taking proactive steps to streamline visa processes for AI experts.³⁵ Enhancing the UK's appeal as a destination for global talent can help strengthen the sector, driving growth by fostering knowledge transfer and innovation.

Issue 7: Supply chain vulnerabilities

The complex global supply chains underpinning AI technologies expose the UK to significant vulnerabilities. AI systems rely on a diverse array of hardware components, software platforms and data pipelines, often sourced from international vendors. This reliance creates risks of disruption from geopolitical tensions, trade restrictions, or supply shortages. A notable example is the UK's dependence on advanced AI chips, with over 60% of global supply produced by the Taiwan Semiconductor Manufacturing Company (TSMC).³⁶ This concentration creates a critical single point

of failure, as any disruption to chip production—whether due to natural disasters or rising tensions in the Taiwan Strait—could severely impact AI development and deployment.

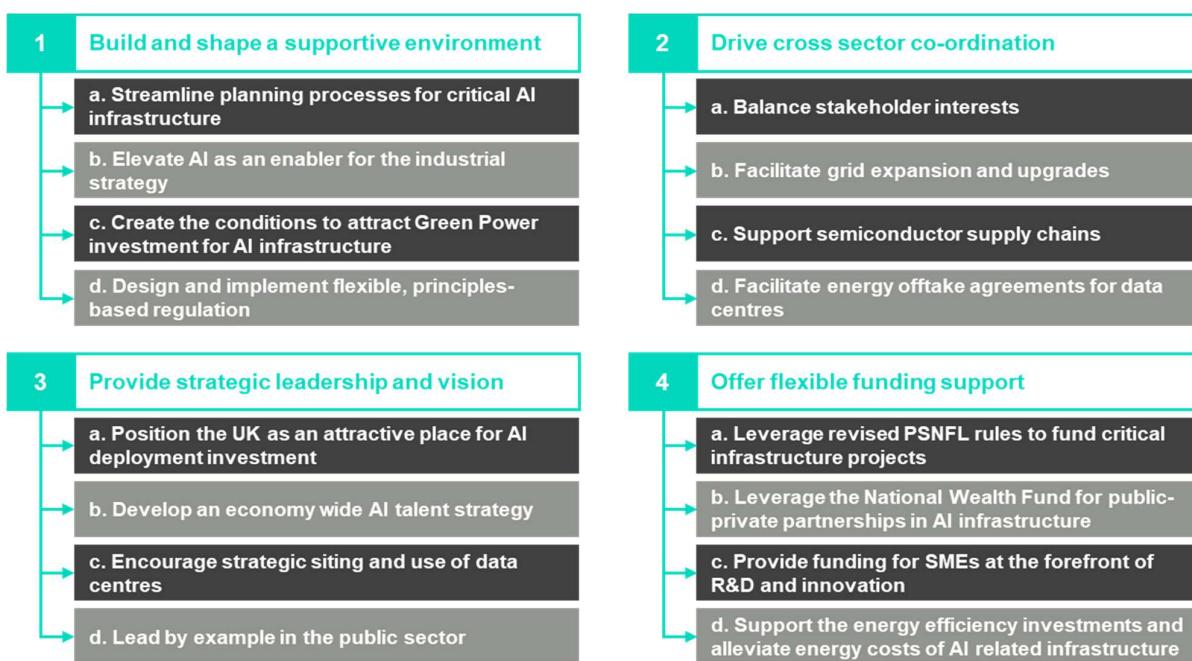
Beyond supply chain concentration, the UK's AI ecosystem faces growing risks from cybersecurity threats and geopolitical instability. AI supply chains, involving components and software from multiple international vendors, are increasingly targeted by cyberattacks, including ransomware, intellectual property theft and compromised hardware. These vulnerabilities not only endanger sensitive data but also risk eroding public and business confidence in AI systems. In addition, geopolitical tensions, particularly between the US and China, threaten to introduce export controls and trade restrictions on key AI technology, worsening access challenges for UK businesses.

In summary, the UK is falling behind in terms of the compute capacity and digital connectivity needed to support the growth of AI, with more, and more modern, data centres needed if the UK is to meet its AI goals. However, this means addressing the growing energy generation and distribution challenges the UK faces, as well as attracting more investment into AI and digital infrastructure in the UK. The regulatory environment is key to this, with a measured approach to AI oversight needed to promote innovation in this fast-paced, dynamic market, alongside planning reform to enable investment in the underlying digital infrastructure and power supplies. Finally, the UK must overcome barriers to AI adoption and skill shortages to promote and accelerate successful embracing of AI technologies, while remaining vigilant to supply chain and geopolitical vulnerabilities to ensure the resilience and sustainability of its AI ecosystem over the long-term.

3. What can the Government do about it?

The Government can make significant progress on the AI Opportunities Action Plan using the **fiscally neutral tools and powers already at its disposal**. By facilitating critical infrastructure upgrades, fostering a supportive regulatory environment, leveraging regional strengths, and cultivating a highly skilled workforce, the Government can unlock AI's potential to drive economic growth, enhance public services, and strengthen the UK's international competitiveness.

To support the Government in delivering the AI Opportunities Action Plan, **we identify four key roles it should embrace**. To tackle the challenges outlined in Section 2 and accelerate AI growth, we propose a range of concrete actions under each role, combining immediate, decisive measures with long-term strategic initiatives. While not exhaustive, these recommendations lay a foundation for progress. Colt would welcome the opportunity to convene a working group with the Government and key ecosystem players—such as National Grid, the National Infrastructure Commission, Google, and Amazon—to explore these areas further and drive the plan's implementation.



A. Shape a supportive environment

A holistic policy approach will make the UK an attractive destination for continued investment and growth by AI businesses, at no cost to the public purse.

A.1. Streamline the planning process for critical AI infrastructure: the UK can accelerate the creation of high-performance computing hubs by integrating critical AI infrastructure, such as data centres, into the Nationally Significant Infrastructure Projects (NSIPs) process. This would standardise and streamline the planning and approvals process, reducing time-to-market for businesses and enhancing the UK's attractiveness as a destination for AI investment.

A.2. Elevate AI as an enabler for the industrial strategy: for each of the eight growth sectors identified in Invest 2035,³⁷ the Industrial Strategy should highlight both how AI can help and be helped. For example, within Advanced Manufacturing, AI-driven robotics and automation systems

can increase efficiency and reduce waste in production; while initiatives to support chipset design and fabrication could support the next-generation of compute capacity needed for AI.

Case Study: Colt's initiatives in sustainability and energy reduction

At Colt, environmental responsibility is a core value, driving our continuous efforts to reduce energy consumption and contribute to sustainability. Through innovative initiatives, we are making significant strides in energy efficiency:

- Colt has developed and deployed an AI-based system that reduces energy consumption by up to 30% in commercial buildings with centrally controlled facilities. The system optimizes temperature controls, adjusting settings to reduce energy use, especially in response to the changing work patterns post-COVID-19.
- Since 2014, Colt has worked under a Climate Change Agreement with the Government, achieving notable energy savings in our data centers.
- Our AI-driven Smart Building project, starting with our London headquarters, has already delivered significant energy savings. If adopted across commercial and public buildings with central HVAC systems, we estimate this initiative could save approximately one Terawatt Hour per year nationally.
- Additionally, we are deploying solar panels on the roofs of suitable properties, beginning with our London headquarters, which also aligns with our data center operations.

These efforts demonstrate Colt's ongoing commitment to sustainability while driving both environmental and operational efficiency through innovation.

A.3. Facilitate sustainable power investment for AI infrastructure: by attracting private-sector investment into clean-tech projects, the UK can position itself as a global leader at the nexus of AI and clean-energy. This could include reforming power-purchase agreements (PPAs) to make them more accessible, cost-effective and flexible for developers, as well as collaborations with the likes of Google and Microsoft, to aggregate demand for advanced clean-energy technologies such as geothermal, advanced nuclear and long-duration energy storage.³⁸

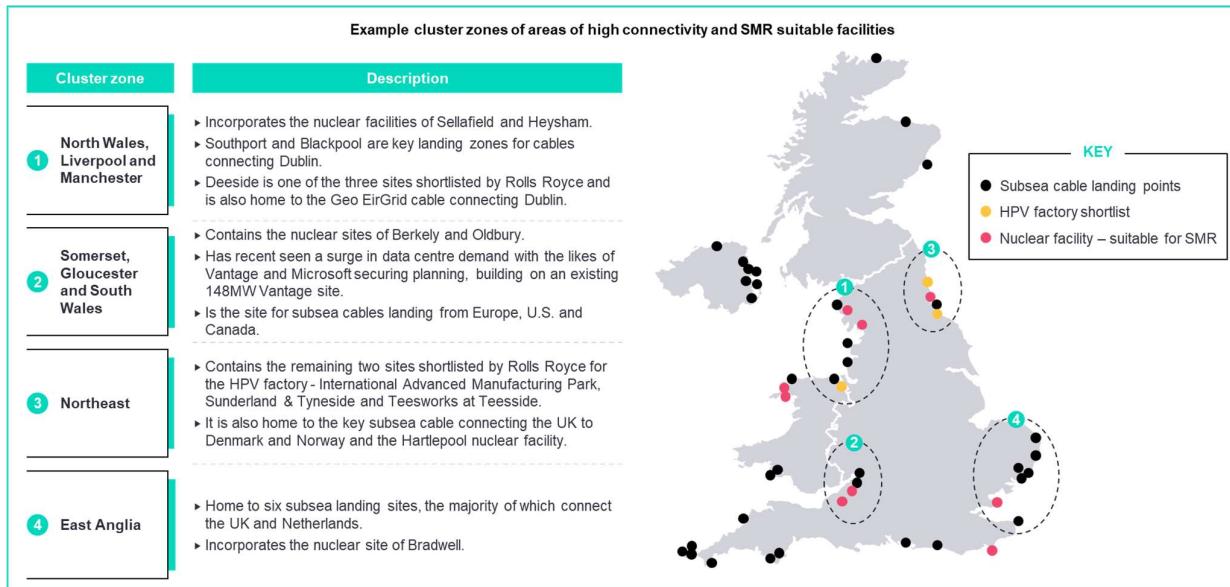
A.4. Implement principles-based AI regulation, Data Protection and competition policy: drawing lessons from both the EU AI Act and the US approach, the UK can implement flexible, principles-based regulations that evolves alongside AI advancements. For example, the EU's emphasis on ethical guidelines and robust data protection ensures trust and safety in AI systems, while the US focus on innovation encourages the rapid development and deployment of AI technologies. The UK's Digital Markets, Competition and Consumers (DMCC) Act lays the foundation for a balanced framework, using tailored rules to encourage innovation while safeguarding consumers and competition. A refreshed approach to Data Protection could further unlock opportunities for the safe and responsible use of data in AI development, ensuring the UK becomes a leader in the global AI landscape.

B. Cross sector co-ordination

Unlocking synergies between different industrial sectors and policy objectives across Government will maximise the benefits of AI growth in the UK.

B.1. Facilitate grid expansion and upgrades: it is crucial that AI infrastructure requirements are explicitly incorporated into the grid expansion action plans currently being drawn up by Government, Ofgem and the National Energy System Operator (NESO). Engaging early with data centres and digital connectivity providers – such as Colt – will provide specific insights into the anticipated future demands of AI that should be included in the grid development strategies.

B.2. Facilitate offtake agreements with data centres: offtake agreements between AI data centres and sustainability solutions, such as Small Modular Reactors (SMRs) for power, or district heating networks for waste heat, can help power the UK's growing AI infrastructure while aligning with its decarbonisation goals. For example, working with regional authorities to define 'cluster zones' for data centres where international connectivity intersects with facilities suitable for Small Modular Reactors (SMRs) could create regional hot-spots for AI innovation and sustainable energy solutions.



B.3. Balance stakeholder interests: establishing a dedicated AI Infrastructure Task Force that includes representatives from the tech sector, telecoms, energy and local communities to address infrastructure issues such as datacentres and connectivity requirements, sustainable energy sourcing and grid capacity. The task force can facilitate discussions, resolve bottlenecks and develop integrated strategies that balance economic, technological and community interests.

B.4. Support semiconductor supply chains: the UK's Arm Ltd. is a global leader in semiconductor design, with its low-power chip architecture powering over 95% of the world's smartphones. However, the UK remains reliant on international supply chains for the GPUs needed for AI. Government can leverage the UK's strengths in advanced semiconductor design to help secure a competitive edge in global AI semiconductor supply chain, through international collaboration and trade agreements.

C. Strategic leadership and vision

C.1. Strategic siting of data centres: Collaborating with local authorities and the private sector to site new data centres in regions with abundant renewable energy resources, potential for heat offtake, and appropriate communications infrastructure, is crucial. This approach will help ensure that the UK meets its national AI goals while promoting regional economic growth. Additionally, it aligns with energy, environmental, and decarbonisation policies. Incentives could include tax breaks or subsidies for locations that utilise clean energy sources or repurposing underused sites to reduce environmental impact.

C.2. Lead by example in the public sector: by deploying AI across public services, such as healthcare, education and transport, the Government can showcase its transformative impact in a real-world setting. For example, the NHS has numerous examples of successful AI applications, from the NHS AI Lab,³⁹ to its partnership with Google DeepMind to monitor patients with kidney disease,⁴⁰ and Palantir's work to improve patient care and operational efficiency.⁴¹ An increased use of AI by Government would not only improve public service delivery, but would also foster increased public trust in AI services that would encourage more private sector investment.

C.3. Position the UK for AI deployment investment: the UK is uniquely positioned across many of the sectors in which AI can most effectively augment human capabilities, such as law, financial services and life sciences. Showcasing the opportunities this presents for AI investors, through events like investment conferences and business development seminars, will help make the country a prime destination for pilot deployments by global AI players.

C.4. Develop an economy wide AI talent strategy: AI skill development should be integrated into the exciting "Get Britain Working" initiative, emphasising critical technical skills like electrical engineering, network engineering and renewable energy systems. Leveraging the new Growth and Skills Levy, the Government can fund targeted training programs and apprenticeships, including foundational and shorter apprenticeships tailored to these sectors. This cohesive approach will future-proof the UK's AI talent pipeline, mitigate workforce displacement risks and ensure the nation becomes a competitive leader in the global AI economy.

D. Flexible funding support

D.1. Leverage the new PSNFL rules to fund critical AI infrastructure: the recently revised Public Sector Net Financial Liabilities (PSNFL) framework unlocks approximately £52 billion in additional fiscal capacity, as calculated by the Institute for Public Policy Research (IPPR).⁴² This presents an opportunity for strategic borrowing to invest in critical digital infrastructure, such as the grid connections and subsea cables that are vital to support the growth of the AI economy in the UK.

D.2. Update the National Wealth Fund to include AI infrastructure: the National Wealth Fund includes a list of four priority sectors that helps guide its funding decisions, including clean energy, transport, water and waste and digital.⁴³ While there is already scope to invest in many AI-enabling projects under the existing banners, we call on Government to explicitly include AI as a priority sector to allow investment in a wider range of projects—such as semiconductor development, data centre modernisation and access network infrastructure across the UK.

D.3. Funding for R&D and innovation by SMEs: the UK is a global leader in foundational AI research, with world-class universities producing cutting-edge technologies and leading talent. However, limited investment is hindering the commercialisation. Providing targeted financial support to SMEs at the forefront of AI R&D, through grants, tax relief, or co-investment programs, would enable these firms to bring transformative AI technologies to market, scale their operations and help the UK become a global leader in AI.

D.4. Support energy efficiency investments: extending existing schemes like the Climate Change Agreements (CCAs) and the Industrial Energy Transformation Fund (IETF) beyond 2028 – to support energy efficiency upgrades such as liquid cooling or AI-optimised energy management, transition to renewable power sources and the implementation of modular designs – would reduce carbon emissions, align AI infrastructure with the UK's net-zero commitments and create a competitive advantage in sustainable AI innovation. At the same time, government should recognise AI-related businesses, such as data centres, as electricity-intensive businesses that are eligible for electricity cost support schemes such as the Supercharger Relief Scheme.

Government can shape the UK's AI future by providing the strategic direction needed to create an environment fit for businesses, researchers and innovators to thrive. Putting AI at the heart of all Government policy will ensure the UK become a leader and unlocks the full and lasting benefits of this transformative technology.

4. A bold future for AI in the UK

Measurable targets

To build on the actions outlined in this paper and accelerate AI-driven growth, government should set bold, measurable targets to track progress and drive success. These could include:

1	Compute capacity	Achieve exascale computing by 2026 , to ensure our infrastructure can support the computational demands of advanced AI.
2	Data centres	Make an explicit goal in the infrastructure strategy to build 4.00k MW of Data Centre capacity by 2032 serviced by between 200 and 350 new data centres, to support adoption and proliferation of AI applications.
3	Investment	Target total AI-related investment, both public and private, of at least 2.5% of GDP annually by 2030 , as part of the UK's strategic growth agenda
4	Adoption	Ensure that targeted skills and training initiatives facilitate the augmentation of 50% of jobs by AI by 2026 , thereby helping to expand productive capacity in the UK

Centralised accountability for AI

Unlocking the potential of AI across the economy and society is a complex and multi-disciplinary challenge. AI is a cross-cutting, general-purpose technology, sitting at the heart of a much wider industrial ecosystem. With the effects of AI being felt across so many different parts of our society and economy, traditional sector-focused policy is unlikely to succeed. While the Government has various tools at its disposal, a **coordinated approach is essential to align the interests of different sectors and navigate the AI landscape**. This requires interdepartmental cooperation and a strategic vision that integrates AI into all areas of policymaking, both locally and nationally.

We therefore call on Government to make a **central body accountable for the consideration, coordination and prioritisation of AI** and its supporting digital infrastructure in everything Government does. This body would play a central role in delivering the AI Opportunities Action Plan. Its mandate would extend beyond oversight, focusing on strategic leadership, sectoral coordination, and flexible funding to accelerate AI adoption. By driving cross-sector alignment, fostering innovation, and providing targeted support, this body will create a supportive environment that:

- **Meets the needs of the AI Ecosystem:** ensuring that the UK attracts the required finance and builds the necessary infrastructure to meet rapidly increased demand.
- **Promotes diffusion:** proactive measures can actively encourage the widespread adoption of AI across sectors and regions, maximising social and economic benefits.
- **Establishes the UK as a pro-innovation economy:** a principles-based regulatory framework will position the UK as a pragmatic, pro-growth economy that promotes innovation while safeguarding consumers and competition.

Moreover, this central body would be crucial in managing the social and economic implications of AI deployment. It could anticipate risks—such as job displacement or data privacy concerns—and formulate strategies to mitigate these issues proactively. Staying ahead of technological trends, will help unlock AI's full potential as a driver of growth in the UK, while ensuring that its benefits are distributed equitably across all of society.

The UK is at a pivotal juncture in the global AI race. To capitalise on this opportunity, the Government must provide strategic leadership, ensuring the UK's AI ecosystem remains competitive. The AI Opportunities Action Plan outlines key actions, but success will depend on a holistic, strategic approach led by a central government body that coordinates efforts and unlocks private investment. This will enable the transformative potential of AI to be fully realised across the UK, driving economic growth and strengthening global competitiveness.

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