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Foundations for the future

How data centres can boost UK economic growth

November 2024

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techUK is the trade association which brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. With over 1,000 members (the majority of which are SMEs) across the UK, techUK creates a network for innovation and collaboration across business, government and stakeholders to provide a better future for people, society, the economy and the planet. By providing expertise and insight, we support our members, partners and stakeholders as they prepare the UK for what comes next in a constantly changing world.

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Henham Strategy is a strategic consultancy that delivers robust research and economic modelling to shape impactful policy recommendations.

With a broad range of government, industry and analytical backgrounds, Henham Strategy has an exceptional track record of supporting public sector organisations, trade bodies, charities and the private sector. This includes working productively with the tech sector to explore how best to account for social value within central government procurement; collaborating with the nations and regions to index digital capabilities; and presenting data centres' economic contribution for this report.

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Foreword

When we consider economic infrastructure and the investments essential for our nation's growth, we often think of roads, railways, energy power grid, power plants, and wind turbines. These assets are vital for our progress. However, for too long, digital infrastructure has not received the attention and investment it deserves, despite its critical role in supporting sustainable economic growth.

Not only are data centres themselves large drivers of direct investment via their construction but the services they provide are the backbone of the UK's economy; without them our transport, energy suppliers and wider economy couldn't function. And with continued Artificial Intelligence (AI) advances, the importance of data centres to unlocking tech-led growth is only accelerating. This is also a sector we are a genuine leader in, with the largest market in Europe.

Our analysis demonstrates that data centres currently contribute £4.7 billion in Gross Value Added (GVA) annually to the UK economy, with the potential for an additional £44 billion in GVA between 2025-35, if data centre capacity can be increased above its recent annual trend growth rate.

techUK commissioned Henham Strategy to develop this report, presenting quantitative and qualitative evidence to demonstrate just how significant a contribution data centres make to the UK economy, and what more can be done to sustain this infrastructure and support their growth. Importantly, the report also shines a light on the impact data centres make in the nations and regions, and shares lessons from data centre development in West London and Slough, Greater Manchester and Cardiff and Newport.

We have a choice; we can go for growth, enable the development and investment in data centres whilst also increasing our own resiliency or we can hinder them, lose their investment and the services that they enable. To enable that growth, greater collaboration between industry and both central and local government is essential. A reliable power supply; high speed connectivity; continued sustainability gains; timely planning decisions; and skilled workers are critical to additional data centre success. As it has already done so, the sector will play its role, but we also need the Government's support to help supercharge our economic growth.

techUK thanks this report's sponsors: Ark Data Centres, Colt Data Centre Services, Keysource, Pulsant, Shoosmiths and Telehouse for their support, alongside all techUK members, the techUK Data Centre Council – comprised of twenty senior business leaders representing the full spectrum of interests of the sector, wider industry, and the representatives of national and regional governments who have contributed their time.

techUK will continue to engage industry and both central and local government to ensure data centres remain at the forefront of the national and local economic growth agenda, with policy that supports the sector's role in delivering on this mission.

Matthew Evans
COO and Director of Market Programmes, techUK

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Executive summary

This report - developed by Henham Strategy and techUK, in partnership with its members - makes clear the economic impact, and the potential to boost the positive impact, of data centres on the UK economy.

The primary economic value of data centres is their role in enabling digital transformation across all sectors of the economy, allowing businesses to benefit from digital products and services that allow them to operate and be more efficient and productive. Although the wider economic impact induced and enabled by data centres goes beyond the scope of this analysis, the fact that almost every job in the UK is reliant on a data centre should not go unnoticed and should be a key consideration for national and local policymakers reading this report.

Combining both robust quantitative analysis with impactful qualitative insights shared by techUK's members and policymakers in national and regional governments, the economic importance of data centres to the UK economy is clear. Our analysis suggests that, on an annual basis, data centres are contributing:

- **£4.7 billion**
  in GVA to the UK economy
- **43,500**
  jobs in the UK economy
- **£640 million**
  in tax to the exchequer

To unlock further innovation and tech-led growth fuelled by the continued advancement of AI and emerging technologies, additional data centre capacity and capability are required.

If the UK can increase data centre capacity above its recent trend growth rate – from 10% a year to 15% a year – it will result in a:

- **£44 billion**
  additional GVA between 2025-2035 from the construction and operation of data centres
- **40,200**
  additional jobs directly employed in (often high-paying) data centre operational roles
- **18,200**
  additional jobs directly employed in data centre construction roles over the period 2025–35
- **A £9.7 billion**
  additional tax revenue generated by the industry over the period 2025–35

The scale of this potential national economic impact is mirrored when looking to the nations and regions. By seizing the role of data centres, which will support well paid jobs and greater innovation, there is a real opportunity to deliver local growth right across the UK.

If this national and regional economic opportunity is to be realised, it is essential the broader data centre policy opportunities and challenges are fully understood. Aligned to the Government's mission-led approach, and in thematic areas that cross different Whitehall departments, the industry has been leading on important initiatives that are driving positive outcomes.

Current contribution from UK data centres

GVA	Employment	Tax
£4.7b in GVA to the UK economy	**43,500** jobs in the UK economy	**£640m** in tax to the exchequer

Potential contribution from UK data centres

GVA Boost	Tax Boost
£44b additional GVA between 2025–35 from the construction and operation of data centres	**£9.7b** additional tax revenue generated by the industry over the period 2025–35

Employment Boost	
40,200 additional jobs directly employed in (often high-paying) data centre operational roles	**18,200** additional jobs directly employed in data centre construction roles over the period 2025–35

Energy

It is no secret that the provision of data centre space at scale – like all productive industries – requires a lot of power, and the sector faces significant challenges in securing timely grid connections and appropriately priced clean energy.

The industry continues to make strides to secure dedicated, low and carbon-free energy supply. For example, some data centre owners are procuring Power Purchase Agreements (PPAs) with suppliers of renewable energy, helping to unlock additional renewable capacity on the grid and contributing to the security of supply pricing, while hyperscalers are starting to fund the building of on-site renewable energy power plants. In addition, there are further opportunities for data centre developers and investors to pilot new solutions, such as geothermal or small modular reactors (SMRs), to provide more stable energy sources.

There have been very positive policy developments toward potential solutions, including the establishment of the National Energy System Operator (NESO) and publication of the Connections Action Plan. It is critical that Government implements these changes effectively to ensure that power constraints do not hamper the growth and development of the data centre industry.

Policy recommendations

- The Department for Energy Security and Net Zero (DESNZ) needs to work with the Office of Gas and Electricity Markets (Ofgem) and NESO to regularly monitor and publicly report connection queues as well as reform the queue processes, for both load and generation to ensure projects are entering the market in timeframes and locations needed to increase cost effectiveness of the system. DESNZ, Ofgem, and NESO should also continue to work to ensure energy costs are affordable, by providing clarity on next steps for REMA.
- The grid connection process must provide open data available for developers and investors to understand likely connection timescales and project options throughout the year. Accurate and non-shifting connection estimates are critical to providing contractual certainty for investments. Furthermore, the connection gates must also incorporate the possibility of digital infrastructure energy demand increases in a short period of time and provide flexibility.
- While Great British Energy aims to lower energy bills by increasing renewable energy production, the benefits may not be immediate. The upfront costs of developing renewable energy projects need to be covered first, leading to uncertainty and socialisation of costs to the end consumer. This is why visibility over the strategic direction and coherent whole system view is needed.
- The rapid digitalisation of the sector is crucial for informed decision-making in critical areas such as operational control, effective investment, system spatial planning, demand and supply forecasting, and maintaining control and visibility. These elements are essential for establishing a clean and economically efficient energy system.

Sustainability

While the demand for data and AI applications is increasing, the data centre industry has been driving increased efficiencies and making better use of the power required by its customers. Despite a doubling of data centre workload, electricity demand has remained flat since 2015, and significant efforts across the sector mean that the average Power Usage Effectiveness (PUE) – the ratio of the total amount of power a data centre uses and the amount of power used for the IT equipment housed within it – is improving in the UK, demonstrating energy efficiency gains by the industry.

There is an ever greater focus on sustainability as international organisations and alliances (including the Climate Neutral Data Centre Pact) collaborate to set sustainability standards. These standards will be front and centre as operators continue to seek ways to optimise resource use, especially with the increasing adoption of generative AI by end users that is driving an increase to power density, which can be energy or water-intensive.

Resource optimisation is being observed through several initiatives. This includes the rise of prefabrication and modular (PFM) data centres that can enable the construction process to take place off-site. The exploration of district heat networks, and ongoing experiments around how residual heat can benefit communities and the environment, are further examples of the positive work being driven forward by the industry.

Policy recommendations

- DESNZ should consider previous techUK recommendations with regards to the Climate Change Agreement (CCA) for the data centres sector. In particular, we encourage the prioritisation of carbon savings, as this would expand the scope to include enterprise (in-house/non-commercial) data centres, as well as drive energy stewardship, improved efficiency, transparency, benchmarking and accountability within the part of the sector that is currently ineligible for the scheme but where there is potential for significant energy savings.
- It is necessary to balance the need for both lowering energy demand and decarbonisation measures to be considered and implemented, rewarding operators with robust plans for measuring, monitoring and reporting progress on their journey towards net zero, aligning with International Sustainability Reporting Board (ISSB) Standards.
- There is significant promise in integrating data centres into district heat networks, once heat networks are developed, but industry consensus is that residual heat reuse should ideally be explored after a data centre has been optimised from an energy point of view. This – alongside key challenges including seasonal fluctuations and variable energy demand in the UK – means rules around heat export must be flexible if data centres are considered as heat sources.
- We strongly recommend a spot check exercise to review resilience measures in a subset of on-premise data centres, ideally across both public and private sectors, to ensure that resilience measures are appropriate for the type of data that is managed by the facility. As the next step, the Government could also create a central register of all data centres that it operates, as recommended in the *"Review of the cross-cutting functions and the operation of spend controls"* conducted by Lord Horsham in 2021. We believe this would be a helpful step in improving transparency and should be extended as widely as possible across the public sector.

Planning

The UK's planning system requires reform to ensure data centres can reach their full potential in driving significant economic growth.

Currently, there is no data centres national policy statement (NPS), with the lack of clear national planning guidance meaning data centres often suffer delays and inconsistent decision-making. It is imperative that necessary resource – with the required data centre expertise – is made available to review and progress data centre planning applications within Local Planning Authorities (LPAs).

The Government's decision to designate data centres as Critical National Infrastructure (CNI) and proposed direction to include data centres within the Nationally Significant Infrastructure Projects (NSIP) consenting regime as part of the recent National Planning Policy Framework (NPPF) consultation are steps in the right direction. It is vital that local places realise the benefits of hosting data centre infrastructure, and the industry wants to work with local people and authorities to understand how these benefits and social value can best be delivered.

Policy recommendations

- The Ministry for Housing, Communities and Local Government (MHCLG) should implement the proposed reforms to the NPPF, directing data centres into the NSIP consenting regime process. However, data centres developments should not be forced down this process. This direction will expand options for developers, but the option to apply directly to local authorities should be retained. In addition, the NPPF should:
    - Prioritise the construction of data centres and digital infrastructure on well-connected previously developed and Grey Belt land where possible.
- MHCLG – working with local government – should ensure appropriate resource is available to train both LPAs and the Planning Inspectorate, particularly in areas with a significant number of applications, leading to these teams having a greater understanding of the specific planning requirements attached to data centre infrastructure. This will help provide consistent decision making on data centre applications. techUK's data centre experts can support on the training and education required.
- The Environment Agency should be set clear deadlines when providing environmental permits for data centres with standby generating capacity of over 50MW. Delays in receiving these permits results in delays to planning approval.
- Local government representative bodies should establish a new forum with the data centre industry to forge closer joint working required to seize the data centre opportunity. This could include collaborating to develop a data centre social value framework.
- Mayoral Combined Authorities (MCAs) should develop specific data centre strategies that ensure data centres are central to delivering regional priorities. Linked, Local Planning Authorities (LPAs) should ensure that data centres are integrated into, and appropriate attention is paid to considering data centre requirements within local plans.
- DSIT, MHCLG and DESNZ should collaborate with industry to develop clear planning guidance – through the drafting of a National Policy Statement for data centre infrastructure – providing planning guidance for data centre developers and the Planning Inspectorate.
- The industry welcomes the role that DSIT has been playing in coordinating with other government departments. We would encourage further coordination to ensure any further policy developments across areas of government remain coherent and consistent in their approach. In the past, data centres were often caught by default in numerous regulations (see our techUK 2020 report). It is therefore imperative to achieve growth objectives that various policies do not diminish these aims, and support DBT/OFI and DSIT in their efforts to promote internationally the industry in the UK and its competitiveness.

Skills

The data centre industry provides the opportunity for good and stable jobs, with a median salary well above the national average, but faces pressing skills challenges that must be addressed.

As it stands, the industry is comprised of a significant volume of highly experienced employees. While they provide vital institutional and sector knowledge, there is a risk it is lost if it is not transferred to the next generation. There are also persistent challenges facing the industry, including fierce domestic and overseas competition for both entry-level and experienced talent; a lack of visibility of the sector as an employer of choice and negative data centre perceptions; and the relative lack of diversity within the sector more widely.

In response, the sector is implementing important initiatives, such as the establishment of the National Data Centres Academy and HireHigher's Rising Star Programme; while operators like Ark Data Centres, Telehouse and Colt Data Centre Services are building deep links in their communities by partnering with colleges and universities to create pathways from education to industry. It is equally vital that both central and local government adopt policies that will enable an uptick in the necessary digital and technical skills required for a successful career within both the data centre and wider tech sectors.

Policy recommendations

- The Department for Education (DfE) should engage techUK's Data Centre Council to collate insights on the high-value data centre related training that should be accessible through the Growth and Skills Levy.
- DfE should also reform the Apprenticeship Levy to cover intensive courses that focus on data centre skills.
- The industry should proactively collate and showcase non-commercially sensitive information on the good, career progressing opportunities within the data centre industry – shining a light on the positive career pathways data centres provide. This will help to raise the profile and reputation of the sector and will aid Skills England's ambitions to map occupations onto education pathways to understand the most common pathways into priority professions.
- The industry should build on good practice of engaging local authorities and local educational institutions and develop a systems-level approach to the education sector in order to build a comprehensive understanding of the opportunities for young people to gain experience across the industry.

Data centres in the nations and regions

Whilst the UK's data centre industry has predominantly called Greater London home, there are growing hubs – including in Greater Manchester and Cardiff and Newport – primed to host data centre infrastructure.

In the course of our qualitative research, we engaged representatives of those places – selected for their different data centre maturity levels – providing an important view on what can be done to support nations and regions at different stages along their data centre journey.

Our research found that there is a need to consider data centres more strategically and proactively within broader spatial planning ambitions; for better collaboration between the public and private sectors; and for more evidence and understanding of the economic impact that data centres bring to these places, which this report addresses in part.

Conclusions

The data centre industry is making a significant economic impact today – and huge untapped potential remains.

The sector itself is making great strides forward and stands ready to play an even greater role but capitalising on the opportunity to both enable and drive tech-led growth across the country requires further collaboration between industry and both central and local government.

In this document, we set out a series of recommendations to enable this vitally important industry to play a leading role in the UK's efforts to secure the highest sustained growth in the G7.

Introduction

Data centre space is the ***physical infrastructure that houses the computing and networking equipment (primarily servers) that businesses use to store, process and share data.*** It is important to note that the times when business-critical computing and storage requirements could be adequately supported within a general office facility are now largely in the past. Now, every email sent, online search made, or webpage scrolled is processed in a data centre.

Whilst tech advancements – from the advent of the internet to smartphone adoption – have always been at the heart of our economy and society, data centres have received relatively little attention. However, the critical importance of data centres to the UK economy was particularly highlighted by the coronavirus pandemic. The widespread shift to hybrid working demonstrated the importance of having resilient, sustainable and efficient data centres that enable economic activity. For example, the Norwegian Data Centre Industry Association recently estimated in a report that the cost to the Norwegian economy per day in the event of an extensive power outage could be as high as NOK 1.3 billion (roughly £92.6 million in October 2024).[1]

At the same time, however, in providing facilities to support our demand for computing power, data centres have faced some negative media coverage, largely triggered by the impact of extreme heat waves on digital infrastructure and sustainability scrutiny as the UK moves towards its net zero targets.

The recent surge of AI tools onto the market are likely to accelerate digitisation across the economy. In order to keep pace with this innovation and boost tech-led growth, it is vital that investment is prioritised to expand data centre capacity and capability.

The new Government, elected on a manifesto focused on delivering growth, is making early progress in providing a more supportive data centre policy landscape.[2] This includes designating data centres as CNI and consulting on directing data centres into the NSIP consenting regime process, as part of updates to the NPPF.

Despite these developments, the level of integration into planning, and awareness and expertise on data centres, across central and local government, remains relatively limited. Stakeholders across both the public and private sectors have repeatedly made clear the need for better education around what a data centre is, what it does, and therefore the economic activity it enables in the UK.

This is not entirely unexpected. The data centre industry is not straightforward to understand or appreciate. There are a vast range of players, from global giants such as Meta, Google, Oracle and Amazon Web Services (AWS) through to specialist operators, such as Ark Data Centres, Pulsant, Telehouse and Colt Data Centre Services. The distinction between those operators who provide the infrastructure and their clients that use it adds further layers of complexity.

Very broadly, the sector can be broken down into the different types of data centres listed in the table below.[3]

Type of Data Centre	Overview
Enterprise (In-house or on-premise)	Dedicated on-premises facilities, which can even include server rooms, to support the IT functions of organisations, such as universities, hospitals and banks. Many companies will opt for enterprise data centres where full control of infrastructure is required to house sensitive data, meet data sovereignty requirements or tailor customisation and optimisation requirements. In some cases, enterprise facilities are decreasing in popularity as they tend not to reap economies of scale benefits.
Colocation ('Colo')/Wholesale	An operator will provide space for other organisations (such as banks, legal firms, an insurance company, or other tech companies) to locate their servers. The service provider can vary significantly in a colocation data centre – colocation providers can supply wholesale space where the customer determines most details or retail space that is fully fitted and ready for servers to be installed. In this type of data centre, the customer owns and manages the servers and related hardware, and the building operator is only responsible for the physical space and on-site utilities.
Managed infrastructure	Managed hosting is an IT service model in which customers lease dedicated infrastructure from the data centre provider. This differs from colocation facilities in that customers do not own and maintain the servers and networking infrastructure running their software but do have more control over the hardware and operating system than a true 'multi-tenant' cloud computing service.
Edge	This type of data centre is a move away from large hubs and towards a smaller and more distributed model. They are characterised by their position on the periphery of the communications network – therefore near to the customer – and operate in a wider variety of locations compared to traditional data centres. Edge, therefore, provides local, low latency computing power, and may also be deployed on a colocation basis, or as managed infrastructure. Some companies, such as Deep Green, co-locate their edge data centres with other infrastructure for the purposes of heat use, for example: swimming pools.
Cloud	Cloud computing is the on-demand delivery of IT resources over the internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining physical data centres and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider. In this model customers have the lowest level of physical control over the data centre as services are virtualised in a 'multi-tenant' configuration with several customers sharing the same infrastructure. Most cloud services are sold by 'hyperscaler' providers operating very large data centres which reap the rewards of economies of scale and are highly efficient. Hyperscale cloud providers offer local 'availability zones' hosted in data centres located in the UK, but also offer access to a global network of infrastructure.

The national economic impact of data centres

The modern economy would not function without data centres. They are as important as energy, transport, and water infrastructure to our way of life. Data centres are also the backbone of advancements in AI, providing the necessary computer power and data storage.

Data centres are of particular importance to future economic growth. The technology most likely to deliver big-ticket productivity gains – such as AI, cloud computing and quantum processing – needs a thriving digital ecosystem that has data centres at its heart.

There is a substantial economic benefit if these cutting-edge technologies are adopted at pace and scale. For instance, it has been estimated that generative AI tools could create £31 billion of GDP to the UK economy in the next decade.[4] Turning this hypothetical value into real value will require more than just data centres – the right digital skills and other types of digital assets are also critical.

Beyond this, the data centre industry makes a standalone economic impact. The expenditure of companies building and operating data centres supports supply chains, employment and generates tax revenues. Understanding how and where this impact occurs, and its size, is vital in evidencing data centres' critical role in local economic development as the UK attempts to break its low-growth malaise. Therefore, the evidence presented in this report provides policymakers with estimates of the economic contribution that the data centre industry makes to the UK.

Measuring the data centres industry

There are different estimates of the number of data centres in the UK. One reason is that there is no universal definition of what a data centre is, e.g. small, on-premises server rooms may or may not be counted.[5] Another is that data centres do not have an industrial classification, meaning that they are not specifically measured by the UK's official statistics body. There are also data centres that exist to support sensitive activity and therefore there is no record of them, for example those involved in national security.

Our analysis uses an estimate of 450 data centres in the UK. This number is based upon the number of data centres signed up to Climate Change Agreements (CCAs) with an additional estimate number of enterprise data centres (see Annex I for full description).

The size of a data centre is typically measured by its demand for power. The greater the power demand of a data centre, the more capacity it has is to provide data centre services.[6] This does not mean there is a linear relationship between capacity for services and demand for power. Nevertheless, using estimates from market intelligence companies our analysis assumes that the average UK data centre has 6.3MW of capacity.[7] In today's UK data centre landscape, 80% of data centre capacity can be found in the Greater London area.[8]

Annex I sets out the methodology and observations on measuring the economic impact of the data centre industry in more detail and can be accessed here.

The routes to economic impact

The primary economic value of data centres is their role in enabling digital transformation across other sectors of the economy, allowing businesses to benefit from digital products and services that make them more efficient and productive. Almost every job in the modern economy is linked to a data centre at some point in the supply chain, so the full impact of data centres includes the value of the software running in them. Although the economic impact of the digital services offered by data centre customers goes beyond the scope of this analysis, it should be considered by policymakers when assessing the value of the data centre industry to the UK economy.

The data centre industry makes an economic impact by *building* data centres and by *running* data centres.

This impact is made via three routes:

- **Direct impact.** When a data centre is built and fitted out, money is spent on design and installations, e.g. construction, mechanical and electrical materials, planning applications, infrastructure provision, and wages. When a data centre is operational, money is spent on goods and services, e.g. a power supply and cooling, and wages.
- **Indirect impact.** The initial expenditure paid to data centre suppliers is then used on subsequent business-to-business transactions, creating further economic activity.
- **Induced impact.** The people employed within the supply chains that serve data centres spend their wages on goods and services within the wider economy.

The size of these impacts is represented by 'multipliers', derived from official data on how different industries produce for, and consume from, one another. Put simply, multipliers, *"...capture the idea that a change in spending in one part of the economy can have a knock-on effect on other parts of the economy"*.[9]

The larger the multiplier, the larger the impact an industry's spending has on the economy. There is a growing body of work that has attempted to estimate the GVA and employment multipliers associated with data centres, i.e. how much economic output and how many jobs data centres support in the wider economy.

Each of these estimates are specific to the individual data centre, e.g. the size of the data centre and the extent to which it utilises renewable energy, and specific to the local economies where they are built, e.g. the split of local, national and international supply chains supporting the building and operations.

Hence, there is a wide range of estimates of the economic multipliers attached to each data centre.

GVA

Studies examining the economic impact of building and operating data centres vary in their focus, with some analysing local impacts, others national impacts, and some considering both. Their findings indicate that:

- For every £100 of GVA directly generated by data centre *construction*, **between £29-£97 in additional GVA.**
- For every £100 of GVA directly generated by data centre *operations*, **between £17-£164 in additional GVA.**

The upper end of these multiplier ranges put the construction and operational impact of data centres in line with the economic impact of wider relevant industry groups. For instance, the equivalent GVA multiplier for the whole construction industry has been estimated to be 1.9 (an increase of £100 in GVA for the construction industry would result in £90 in additional GVA for the economy); the equivalent GVA multiplier for information services is 1.5 (an increase of £100 in GVA for the information services industry would result in £50 in additional GVA for the economy).[10]

Some of these GVA benefits will be felt in the local economy, and some in the wider UK. For instance, the economic impact assessment of the proposed data centre in Havering suggested that 62% of the total UK GVA benefit would be felt in Havering.

Employment

Employment multipliers indicate how many jobs one data centre can support, with previous studies suggesting the following ranges:

- Over the course of its build, each job funded by data centre *construction* supports **between 1.4–3.1 jobs in the wider economy.**
- On an ongoing basis, each job funded by data centre *operations* supports **between 1.4–2.5 jobs in the wider economy.**

The mid-point of both ranges is higher than the average across all industries, which stands at 1.7.[11]

Crucially, jobs in data centres tend to be highly skilled and therefore command higher salaries compared to more traditional sites and industries. Research from the recruitment firm DataX Connect has recorded that salaries for data centre roles range from around £49,000 per year to around £129,000 per year (see Table 1).[12] This makes each role relatively high earning. The Day Engineer salary of £48,750 – the lowest paid role recorded in the table – is still in the top 25% of earners in the UK. To give some context, the average salary of a Day Engineer is above that in the North East (£35,800), West Midlands (£36,300) and the South West (£40,100).[13]

Table 1: Data centre roles and average associated salary, 2024[14]

Operations Director	£128,636.36
Operations Manager	£104,583.33
Data Centre Manager	£86,458.33
Technical Manager	£78,571.43
Project Manager	£78,088.24
Shift Leader	£58,653.85
Shift Manager	£57,500.00
Shift Engineer	£49,833.33
Day Engineer	£48,750.00

Wider considerations

It is also important to note wider economic impacts that are challenging to quantify, but that are known to exist:

- **Agglomeration effects.** Data centres have an important effect on the development of sector-specific clusters. When a cluster forms, firms and workers realise benefits from working in close proximity to each other. As such, when considering data centres' economic contribution to the UK economy, it is also important to note several agglomeration effects. These include the scale up of related and dependent industries wanting to benefit from low latency, and the diffusion of knowledge and expertise that unlocks opportunities for local communities to develop the skills needed to secure well-paid data centre jobs.
- **Inward investment.** A favourable environment to build and operate data centres means that overseas companies will deploy capital in the UK, rather than in other countries, supporting economic value and employment.

The national economic impact

The data centre industry is making a significant economic impact today. Taking the average of GVA and jobs multipliers from the previous section and applying them to the current stock of UK data centres suggests that on an annual basis data centres are:

Contributing	Supporting	Making
£4.7b	**43,500**	**£640m**
in GVA to the UK economy (see **Chart 1** for breakdown)	jobs in the UK economy (see **Chart 2** for breakdown)	in tax to the exchequer

Looking specifically at operational jobs in the sector, our analysis suggests output per job of around £98,000, around 40% higher than output per job across the economy as a whole.[15]

Chart 1: Annual GVA generated by operational UK data centres

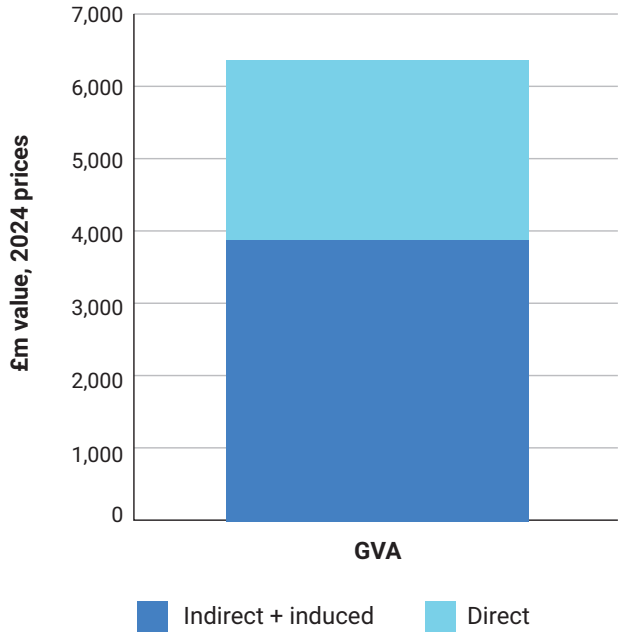
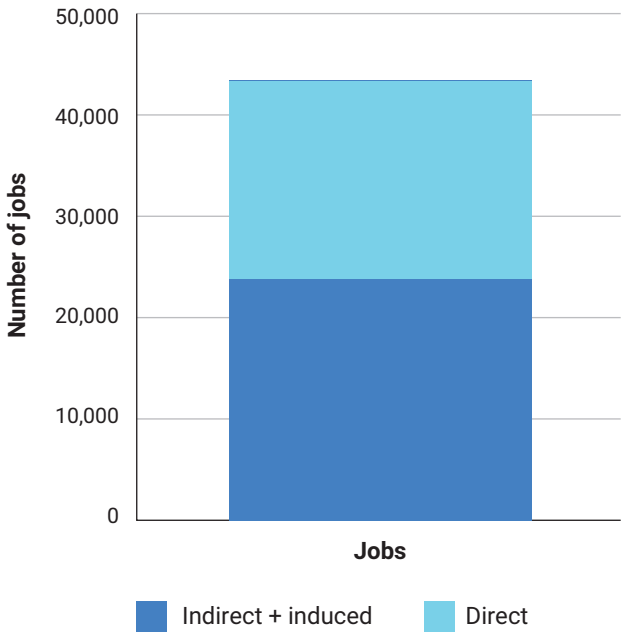


Chart 2: Jobs supported by operational UK data centres



The economic opportunity

The demand for data centres has been steadily increasing and is set to increase at a much faster rate than it has before. The growth in demand for digital products and services, and the advent of data driven innovation and leaps forward in technology, such as AI, will need to be matched by the supply of data centre capacity.

Between 2020–24, it is estimated that the total capacity of UK data centres grew by an average of 10% a year. The same growth rate in the coming years will meet future demand to some degree, but it would be unlikely to match anticipated demand increases. Projections of future demand for data centre capacity have been put at between 10-20% a year.[17]

This is a huge economic opportunity that will only grow as data centres continue to facilitate innovation advances within the tech sector. While the demand for data centres is there, the supply to meet the demand is a concern.

Our analysis suggests that if the UK can increase data centre supply above its recent trend growth rate, from 10% a year to 15% a year, it will mean:

GVA Boost	Tax Boost
£44b additional GVA between 2025–35 from the construction and operation of data centres	**£9.7b** additional tax revenue generated by the industry over the period 2025–35
Employment Boost	
40,200 additional jobs directly employed in (often high-paying) data centre operational roles	**18,200** additional jobs directly employed in data centre construction roles over the period 2025–35

Figure 1: Global trends in digital and energy indicators, 2015-2022[16]

	2015	2022	Change
Internet users	3 billion	5.3 billion	+78%
Internet traffic	0.6 ZB	4.4 ZB	+600%
Date centre workloads	180 million	800 million	+340%
Data centre energy use (excluding crypto)	200 TWh	240–340 TWh	+20–70%
Crypto mining energy use	4 TWh	100–150 TWh	+2,300–3,500%
Data transmission network energy use	220 TWh	260–360 TWh	+18–64%

For context, a growth rate of 10% a year would put data centres as one of the fastest growing industries in the UK. Faster than current annual rates of growth for cutting edge parts of the economy, such as life sciences (6%) and the digital and creative industries (8%). But a growth rate of 15% a year would take data centres to the next level, approaching the current growth rates of highly innovative industries such as gaming (16%) and FinTech (19%).[18]

This supply increase can only be met by a favourable environment to build and operate data centres in the UK.

Chart 3: The GVA opportunity from a more favourable environment for data centres, 2025–2035

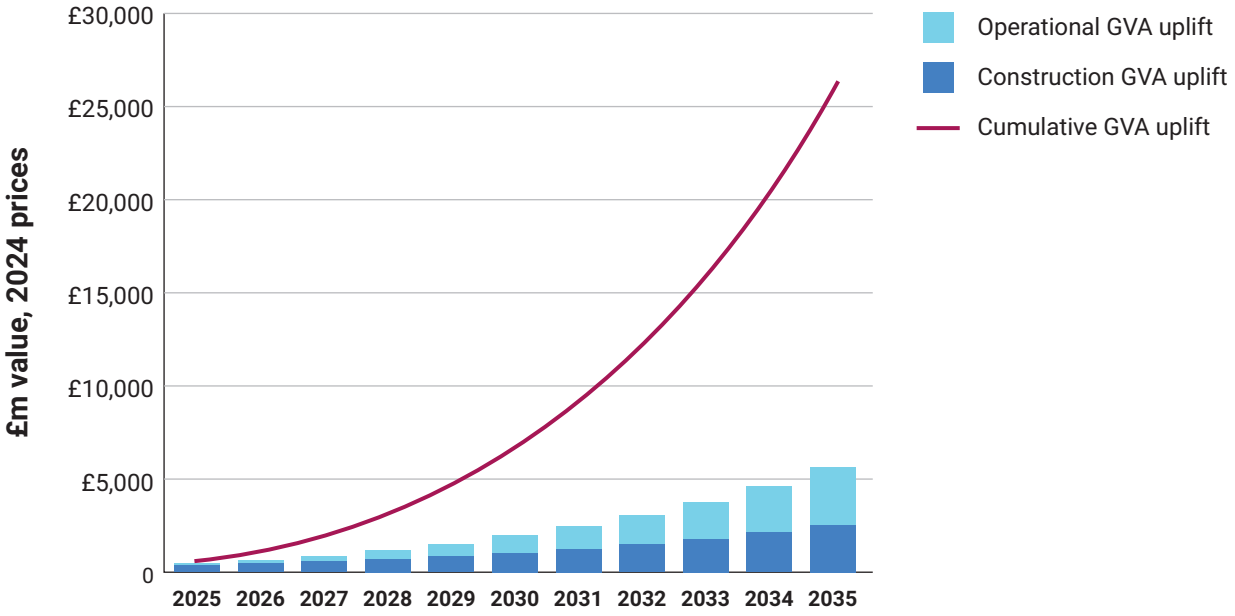
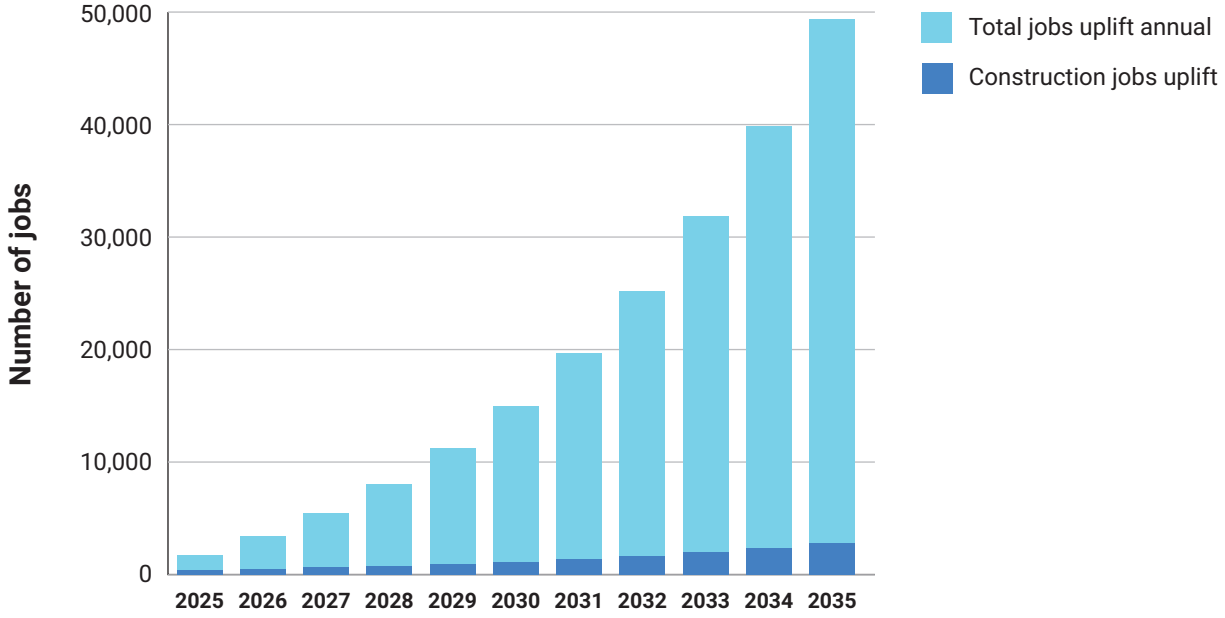


Chart 4: Jobs opportunity from a more favourable landscape for data centre operators, 2025–2035

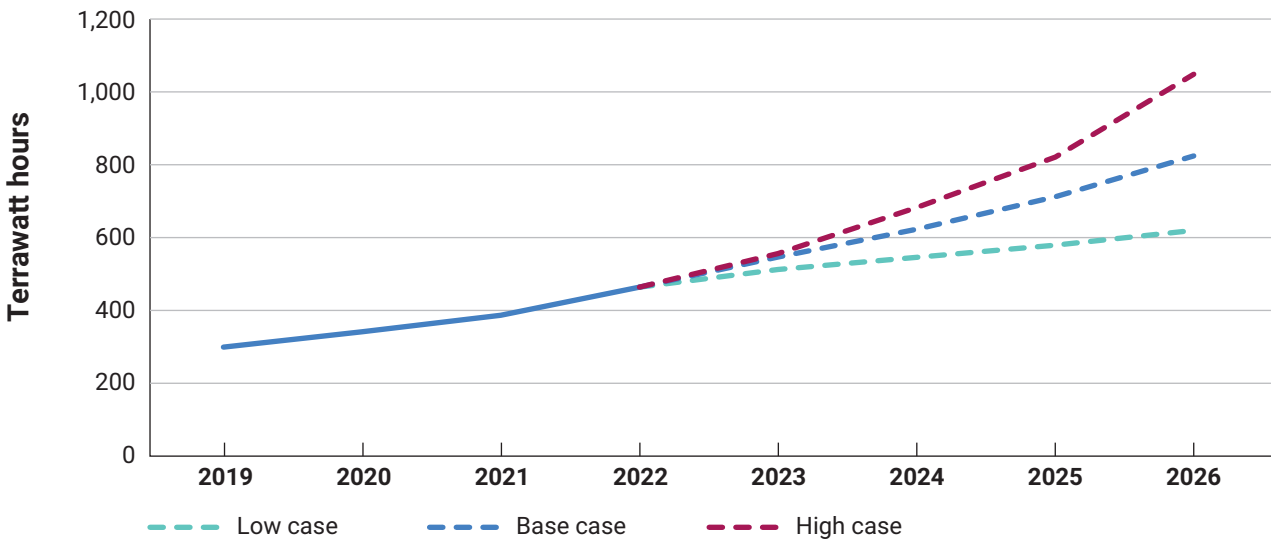


Boosting the national economic impact of data centres

The numbers in the previous section present a strong picture of the significant economic contribution data centres make to the UK economy. However, the need for data centres is only going to grow as the economy continues to develop by adapting to advancing technologies. It is important to understand what can be done to further support the industry's growth in the UK, especially considering the international competition for investment, particularly from Europe and the Middle East.

There are many areas that are central to the future of the UK's data centre industry, such as network connectivity. However, this report explores four key themes: energy, sustainability, planning, and skills. The data centre industry is leading on important innovations and initiatives within each of these themes. It is vital that policymakers, at both the national and local level, fully understand where their collaborative efforts and individual contributions could unlock further economic growth and support the sector.

Chart 5: Global electricity demand from data centres, AI and cryptocurrencies, 2019–2026[20]



Energy

One of the main constraints facing the digital tech industry revolves around the availability and cost of electricity.

Like other productive sectors of the economy, such as transport or manufacturing, data centres require significant amounts of electricity to operate, as they contain dense computing equipment and are responding to growing consumer demand. The power needs of data centres are only likely to increase over the coming years as the economy grows. The International Energy Agency (IEA) reported that global electricity consumption from data centres could double by as soon as 2026.[19]

Recognising these trends, the industry has consistently worked towards more efficient methods to reduce the power losses, increase energy efficiency and meet the cooling needs of computing equipment, enhancing the compute power obtained from each unit of energy. This is driven by the understanding that a stable, reliable, and abundant power supply is crucial for growth throughout the sector.

Notably, electricity demand should not be perceived as a problem unique to data centres, but rather understood as a part of the broader challenge facing all industries that drive economic growth. If the Government aims to support technology-led growth, addressing bottlenecks in energy infrastructure is essential. The solution to electricity constraints is not to limit data centres, which add value to the UK economy, but rather expand the energy supply.

The ability to ensure consistent, reliable, and ample power supply in the UK is heavily affected by delays in securing timely energy grid connection. Many developers experience significant setbacks in obtaining the necessary power. A striking example of this issue involves a company that initially secured a grid connection for a data centre in 2027, only for it to be postponed to 2038. This delay has greatly diminished their confidence in the UK electricity system's capability to support data centre infrastructure. A recent industry survey highlighted this challenge, with 80% of respondents indicating that delays or difficulties in securing power supply are severely impacting data centre project delivery.[21]

Securing a grid connection is a crucial consideration for developers looking to invest in the UK. Once a connection is obtained, the cost of energy becomes a significant factor, as access to affordable power can greatly reduce a data centre's operating expenses. However, similar to grid connections, the UK faces challenges in this area, with energy costs being the highest in Europe.[22]

If these energy constraint challenges are not addressed, the resulting uncertainty may hinder investors trust in the UK as a strong digital infrastructure market. Therefore, further work is required to implement tangible actions to overcome these power challenges.

The good news is that the UK is making major transformations of the sector, implementing reforms and the necessary actions required. There have been positive policy developments in terms of tackling these challenges – including the establishment of

the NESO, publication of the Connections Action Plan, creation of the Government's Mission Control which aims to troubleshoot, negotiate and clear the way for energy projects, as well as establishing Great British Energy. However, each part of the system must work closely together to create coherence and clarity over the strategic vision of the whole energy system, its constraints and investment requirements.

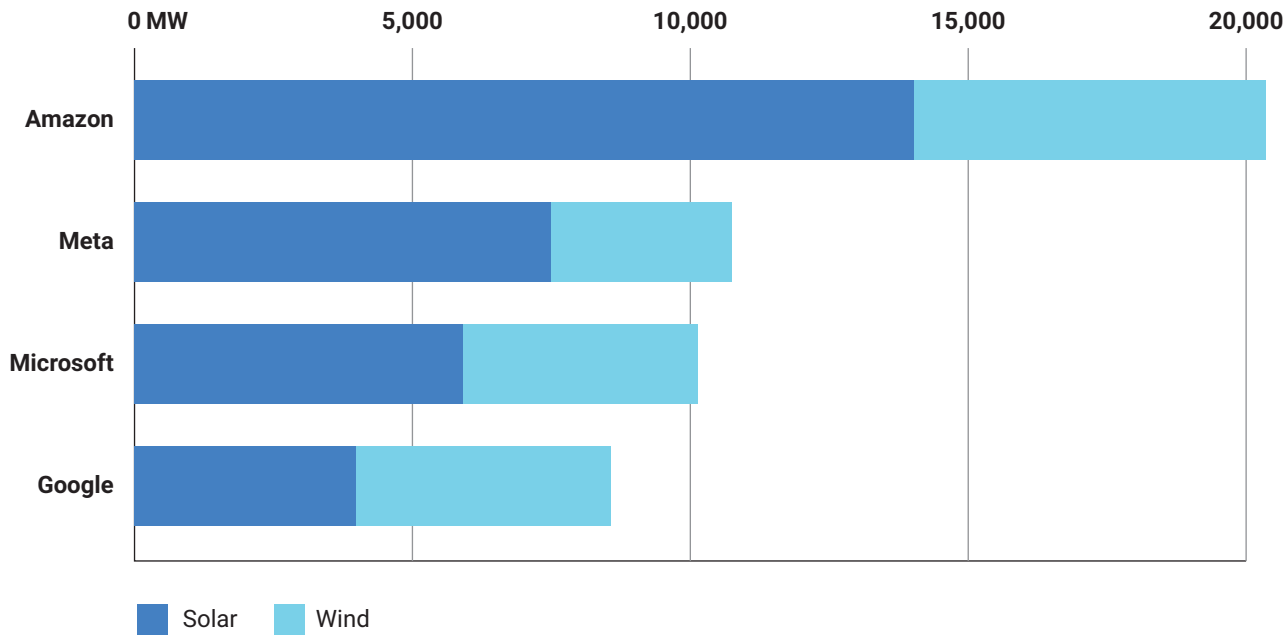
Whilst the availability and cost of power cannot be ignored as detracting from the UK's data centre investment landscape, the industry's focus on sustainability is helping boost investor confidence relative to other countries. With increased focus on Environmental, Social and Governance (ESG) factors within the financial sector, and energy demand expected to grow with the advancement of AI, data centres are proactively exploring new opportunities to secure dedicated, carbon-free energy supplies. Often, data centre operators are on a Renewable Energy Guarantees of Origin (REGO) backed tariff, and are increasingly looking to supplement through PPAs, enabling the confidence and additionality in bringing new renewable capacity to the grid, and security of supply pricing in order to minimise power pricing volatility risk to the business.

Hyperscalers are also starting to fund the building of renewable energy plants. For example, AWS's first renewable energy project in Scotland became operational at the end of 2021. This is one of four new, large-scale renewable energy projects in the UK enabled by AWS and the 50MW wind farm is delivering 168,000 MWh of clean energy annually.[23]

There are further opportunities for data centre developers and investors to pilot new solutions, such as geothermal and wave energy or small modular reactors (SMRs), to provide more stable energy sources and resolve the intermittency challenge that renewables present. Locational energy pricing, if introduced, might also change the equation in terms of where it makes sense to place data centres in the future, and may contribute to beneficial local community rates.

The chart below demonstrates the efforts major data centre operators are putting into corporate renewable energy procurement. By 2023, Amazon, Microsoft, Meta and Google had contracted almost 50GW through renewable energy PPAs, an amount equal to the generation capacity of Sweden.

Chart 6: Top corporate off-takers of renewable energy power purchase agreements, 2010–2022[24]



With the UK energy grid in a state of transition, there is a need to think beyond just renewable energy and consider other elements that can be leveraged to strengthen the overall energy system. This includes enhancing grid flexibility, improving energy storage solutions, optimising energy efficiency across sectors, and integrating smart technologies.

By taking a broader approach, the UK can create a more resilient, reliable, and sustainable energy supply system for the future. Data centres can potentially contribute to this effort in the following ways:

- **Place of consumption.** The transition to renewable energy exposes the grid to increased unpredictability as the power generated depends on when the wind blows or the sun shines. NESO, in their 'Future Energy Scenarios', is looking at ways to influence power demand and mentions data centres as an industry which could potentially be better located in order to increase the consumption of renewable energy and avoid burdens on more gas-intensive areas of the grid.[25]
- **Potential for demand flexibility.** The energy consumption profile of data centres is relatively constant, with overall demand increasing slightly during the daytime due to increased cooling requirements and, to a lesser extent, in accordance with the demand for compute power. While data centres typically have the infrastructure to operate 'off-grid' in emergency scenarios involving grid outages, few are able to participate in arbitrary demand-response services. However, as secondary energy storage and generation technologies for data centres develop, there are several promising avenues by which they may be enabled to participate in elective demand-response.

As operators with a focus on continuous operation, and part of critical national infrastructure, willingness to participate will be curtailed based on the confidence that any such activity would not be detrimental to the resilience of the site.

Industry insights

The continued surge of AI technologies

Liam Phillips, Partner, Shoosmiths

The rise of AI has become a significant disruptor to the data centre industry, with generative AI systems such as ChatGPT being utilised by businesses across the world.

Generative AI has high computer power requirements, with graphics processing unit (GPU) chips often being needed, rather than the traditional central processing unit (CPU) chips to support AI's high density and performance requirements. This has seen the valuations of companies central to this industry skyrocket due to the sheer volume of GPUs required.

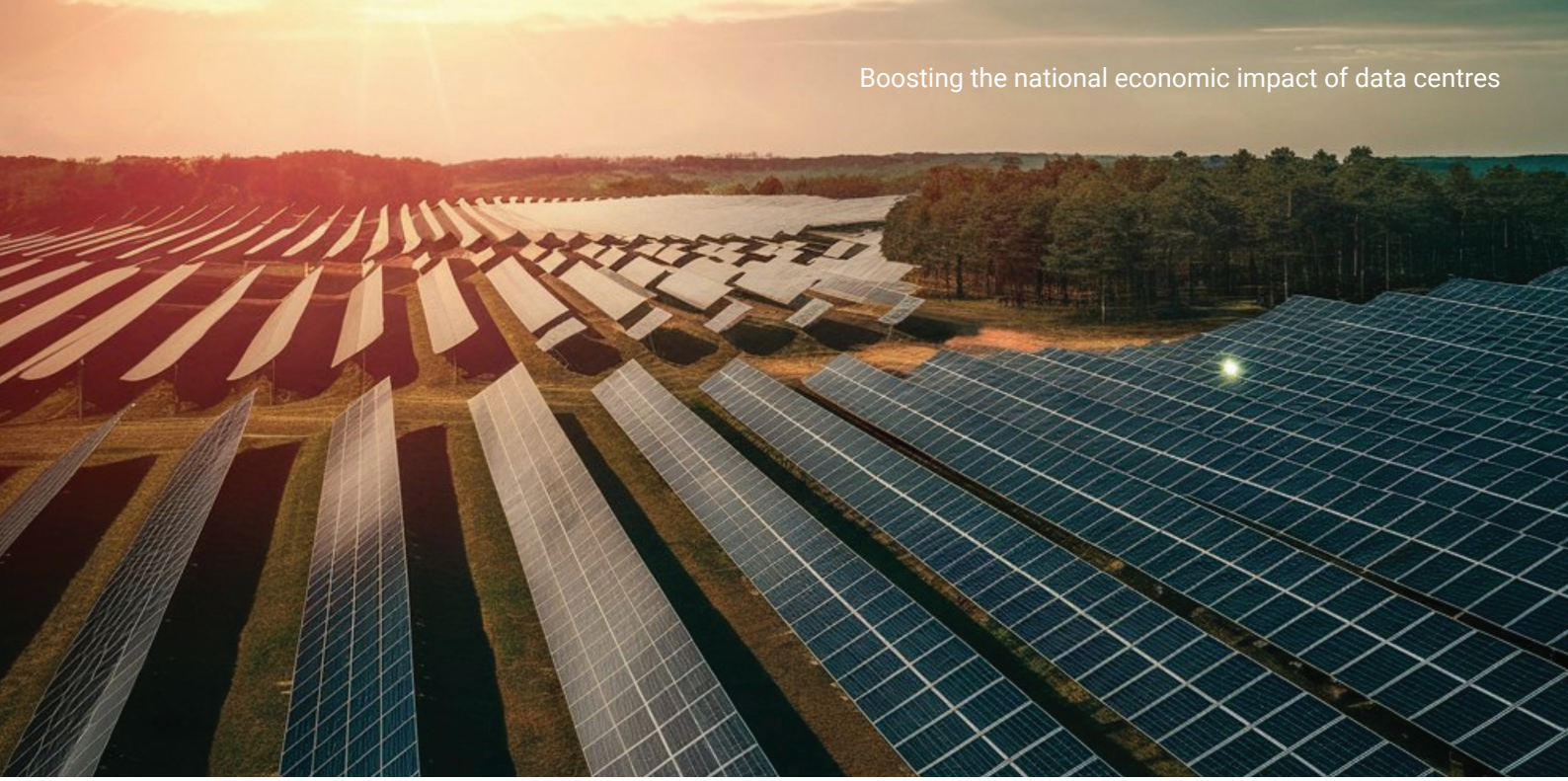
This equipment has a knock-on physical impact on the data centres themselves, as while data centres may be equipped to house GPU powered racks, these consume more power, are physically heavier and generate more heat than CPU powered racks. As a result, data centre operators need to ensure they can physically cope with the demands required of these racks.

They will also no doubt be alive to the challenges of balancing their availability of data halls set up for traditional colocation usage, and data halls that are set up for generative AI GPU racks.

Recommendations

Given the latest energy developments, techUK recommends the following actions to boost data centres' national economic impact:

- The Department for Energy Security and Net Zero (DESNZ) needs to work with the Office of Gas and Electricity Markets (Ofgem) and NESO to regularly monitor and publicly report connection queues as well as reform the queue processes, for both load and generation to ensure projects are entering the market in the timeframes and locations needed to increase cost effectiveness of the system. DESNZ, Ofgem, and NESO should also continue to work to ensure energy costs are affordable, by providing clarity on next steps for REMA.
- The grid connection process must provide open data available for developers and investors to understand likely connection timescales and project options throughout the year. Accurate and non-shifting connection estimates are critical to providing contractual certainty for investments. Furthermore, the connection gates must also incorporate the possibility of digital infrastructure energy demand increases in a short period of time and provide flexibility.
- While Great British Energy aims to lower energy bills by increasing renewable energy production, the benefits may not be immediate. The upfront costs of developing renewable energy projects need to be covered first, leading to uncertainty and socialisation of costs to the end consumer. This is why visibility over the strategic direction and a coherent whole system view is needed.
- The rapid digitalisation of the sector is crucial for informed decision-making in critical areas such as operational control, effective investment, system spatial planning, demand and supply forecasting, and maintaining control and visibility. These elements are essential for establishing a clean and economically efficient energy system.



Sustainability

The two significant environmental pressures created by the provision of data centre space are the one-off impact associated with construction and the ongoing emissions from operational energy consumption. It is crucial to draw a distinction between these two impacts, as the carbon cost of building a data centre is a single, upfront event. Energy consumption, on the other hand, drives emissions and other environmental impacts in relation to national power generation and transmission throughout its lifecycle.

Nevertheless, the industry continues to make positive strides towards its net zero goals, as exemplified by sector initiatives such as the Climate Neutral Data Centre Pact (CNDCP) which demonstrate the importance that the industry places on responsible sourcing of suppliers, educating consumers, and future-proofing growth to meet its digital and green economy ambitions.[26]

In terms of initial infrastructure development, environmental impacts are driven by the need to construct specialist facilities capable of supporting the weight and power demands of dense computing deployments; these requirements mean that most operators consider repurposing of existing industrial buildings for large data centres to be inappropriate. Upstream emissions are related to the materials involved in construction, the activities of construction, and the impacts on land use.

Recent changes in data centre construction technology with prefabrication and modular (PFM) data centres can enable the construction process to take place off-site and cut construction times, reduce costs and improve safety, quality and sustainability. One company recently cut the cost of building a 45MW facility in Europe by 20% and construction time from 17 to 11 months.[27] Moreover, new data centres being constructed across the UK are highly innovative and designed with sustainability in mind. However, challenges around retrofitting (significantly updating or modifying existing structures and systems to improve their performance without completely demolishing them) legacy data centres, which were built with traditional methods and overlooked sustainability, remain.

Data centres and their customers are also striving to mitigate environmental impacts from continuous energy consumption. Even with a reliance on predominantly green energy, the ongoing demand for power and the systemic challenges in energy infrastructure make it crucial for data centres to focus on more efficient methods to meet the power and cooling needs of computing equipment, enhancing the compute power obtained from each unit of energy. This is driven by the understanding that a stable, reliable, and abundant power supply is crucial for growth throughout the sector and beyond.

Many data centre operators in the UK participate in the Climate Change Agreements (CCAs), which is a

government scheme to encourage greater uptake of energy efficiency measures amongst companies in energy intensive industries. By reducing energy use and hence reducing CO_2 emissions, in return operators receive a discount on the Climate Change Levy (CCL), a tax added to electricity and fuel bills. The Environment Agency (EA) administers the CCA scheme on behalf of the whole of the UK.[28]

Efficiency within data centres is measured using a Power Usage Effectiveness (PUE) rating which is a ratio between the total amount of power a data centre uses and the amount of power used for its IT equipment.[29]

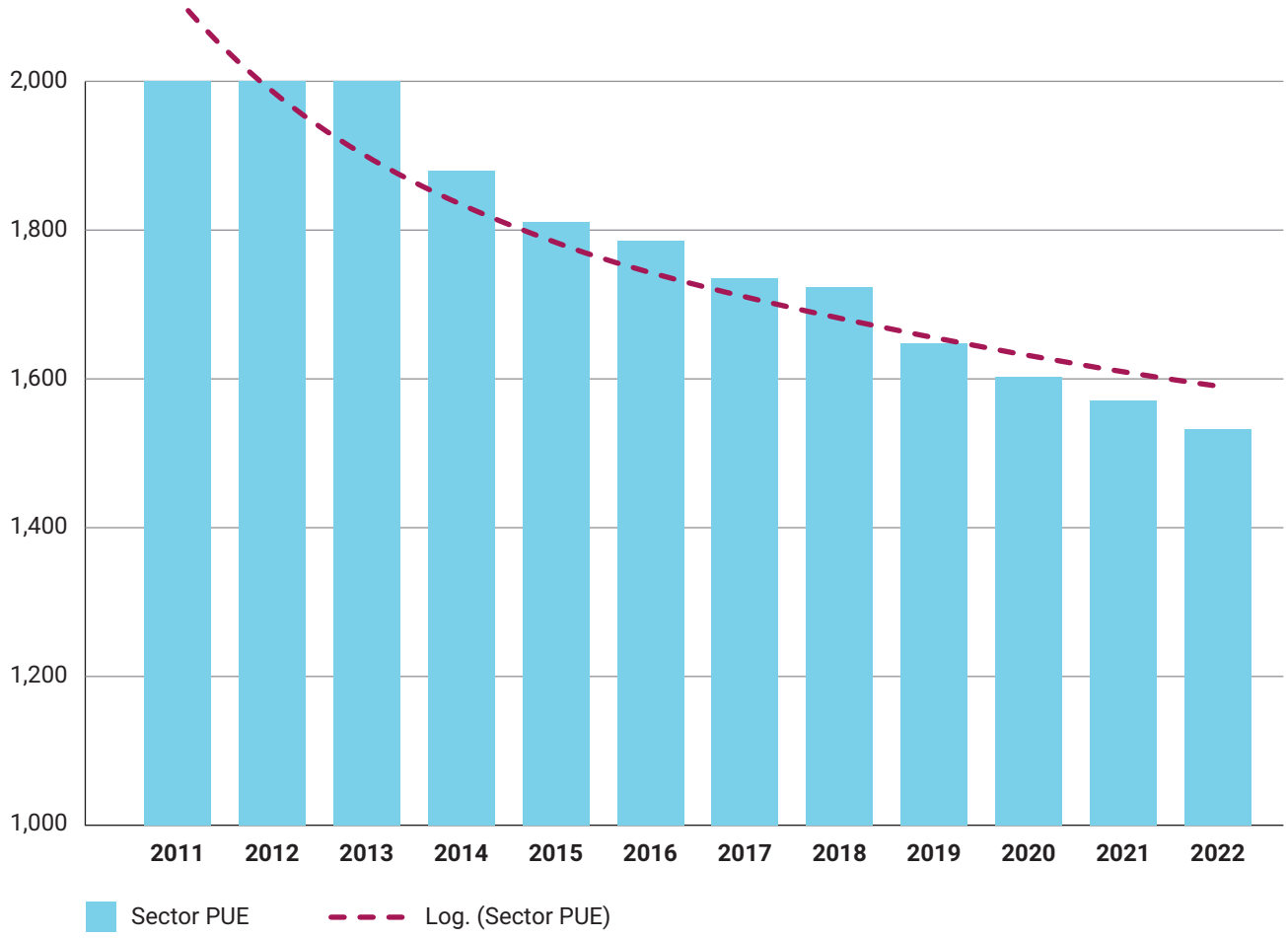
In recent years, the average PUE rating (measured in terms of CCA data) of the UK's data centres has dropped to 1531 in 2022, down from 1878 in 2014, indicating efficiency improvements (especially in relation to cooling systems) made by data centres.

At the same time, data centres' global electricity use has remained relatively flat since 2015, despite data centre workloads more than doubling.[30]

The chart below demonstrates the declining PUE ratings, and therefore the energy efficiency improvements, for the UK's data centre industry in recent years.

There are opportunities for further reducing energy consumption and increasing efficiency through advanced cooling technologies like liquid cooling, which are particularly suited to higher density compute demands from emerging machine learning and AI applications, and energy recycling. Three prominent liquid cooling techniques have been explored to help reduce energy consumption and therefore carbon emissions – direct to chip, rear door heat exchangers, and immersion cooling.[32]

Chart 7: Declining PUE within the data industry[31]



The rise of generative AI has heightened awareness around water consumption, largely because the energy-intensive nature of AI workloads has pushed operators to seek ways to optimise power usage and cooling. As data centres strive for greater energy efficiency to meet the demands of AI applications, they might face a trade-off with water efficiency. In other words, there is an inverse relationship between improving energy efficiency and water efficiency – as one improves, the other may worsen.

Data centres have faced criticism for their perceived extensive use of water. Critics have argued that, as electricity powers servers it generates heat that necessitates cooling systems to evaporate water and release it into the atmosphere. However, while there are certain types of cooling infrastructure that may actively consume water, this is not the case in the UK where most data centres rely on systems that are not water intensive. Many are also looking at innovative liquid-cooling systems (described above) that, despite their misleading name, typically involve closed-loop distribution designs and evaporative thermal emitters that minimise water consumption by recirculating it within the same system.

The energy mix in the UK also significantly differs from that in other jurisdictions, such as the US, where power plants might rely on water for their own cooling needs. In instances where a data centre sources energy from a water-dependent power plant, it may indirectly contribute to higher water consumption. This scenario simply does not exist in the UK given the fundamental differences in the energy infrastructure and data centres' own green energy procurement preferences.

Nevertheless, to address growing water-related concerns, industry initiatives, such as the CNDCP, have enabled operators to work on improving their annual target for water usage effectiveness (WUE), or another water conservation metric.[33] The CNDCP also incentivises exploration of other avenues such as rainwater harvesting or boreholes to lower the reliance on potable water. Data centres could potentially reuse water not only within their own operations but also contribute excess water back into the system for others to help deliver economic output.

Additionally, increasing regulations are expected to put more emphasis on water usage disclosure, requiring data centres to monitor and report their water consumption more transparently. The industry (through techUK) is already engaging with the Environment Agency to track and improve water management practices.

Moreover, the integration of AI and advanced liquid cooling technologies presents exciting opportunities for data centres to export excess heat, which has the potential to improve their own sustainability and contribute to the UK's green transition.[34] Data centres may offer real societal benefit if they are effectively able to contribute residual heat via district heating networks or other potential heat users. Norway provides a good example of what is possible, with a data centre in Ulven (a bustling section of Oslo) being used in new district heating production, supporting the energy needs of approximately 5,000 Oslo apartments.[35] Deep Green has also provided heat to local public swimming pools in the UK free of charge, showcasing the practical application of excess heat in community settings.

However, enabling efficient heat capture and readiness for export requires pre-existing infrastructure, a certain type of cooling system and appropriate climate conditions. While new developments in the UK are increasingly designed with heat export readiness in mind, existing data centres may struggle to achieve this without substantial coordination (especially in colocation settings) and investment. Government support will be instrumental in this context by providing funding, establishing flexible regulatory frameworks, and facilitating partnerships between data centres, heat networks and other stakeholders.

Recommendations

Given the latest sustainability developments, techUK recommends the following actions to boost data centres' national economic impact:

- DESNZ should consider previous techUK recommendations with regards to the Climate Change Agreement (CCA) for the data centres sector. In particular, techUK and data centre operators would encourage the prioritisation of carbon savings, as this would expand the scope to include enterprise (in-house/non-commercial) data centres, as well as drive energy stewardship, improved efficiency, transparency, benchmarking and accountability within the part of the sector that is currently ineligible for the scheme but where there is potential for significant energy savings.
- It is necessary to balance the need for both lowering energy demand and decarbonisation measures to be considered and implemented, rewarding operators with robust plans for measuring, monitoring and reporting progress on their journey towards net zero, aligning with International Sustainability Reporting Board (ISSB) Standards.
- There is significant promise in integrating data centres into district heat networks, once heat networks are developed, but industry consensus is that residual heat reuse should ideally be explored after a data centre has been optimised from an energy point of view. This – alongside key challenges including seasonal fluctuations and variable energy demand in the UK – means rules around heat export must be flexible if data centres are considered as heat sources.
- We recommend a spot check exercise to review resilience measures in a subset of on-premise data centres, ideally across both public and private sectors, to ensure that resilience measures are appropriate for the type of data that is managed by the facility. As the next step, the Government could also create a central register of all data centres that it operates, as recommended in the 'Review of the cross-cutting functions and the operation of spend controls' conducted by Lord Horsham in 2021. This would be a helpful step in improving transparency and should be extended as widely as possible across the public sector.

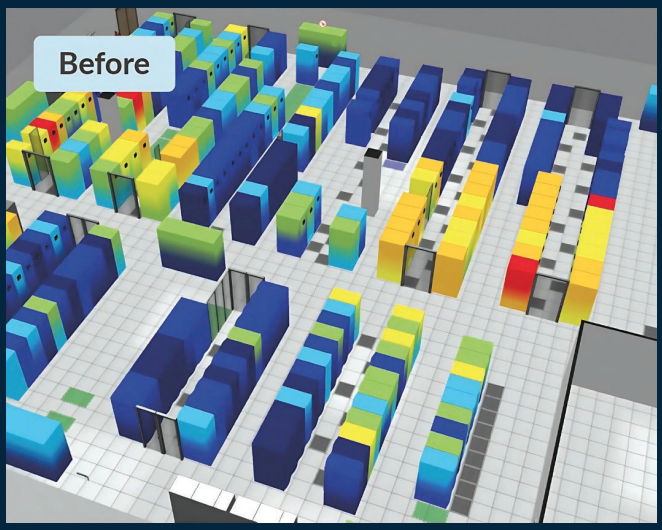
Telehouse's partnership with EkkoSense

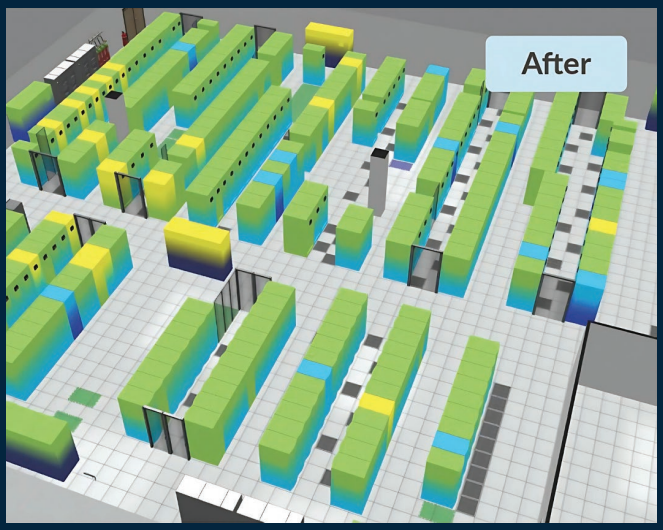
An excellent example demonstrating the positive sustainability improvements being driven forward by the industry is Telehouse's recent partnership with EkkoSense.

Telehouse is a leading global data centre service provider, bringing together more than 3,000 business partners including carriers, mobile and content providers, enterprises and financial service companies.

In 2021, it partnered with software provider EkkoSense to trial powerful data centre monitoring tooling at Telehouse North. EkkoSense's software works by analysing in real-time thousands of temperature and cooling points across the site to identify where levels of cooling can be optimised, and increases the level of insightful data available to the operations team to remove risk and improve resilience.

Following the initial trial, a 10% cooling power reduction was achieved, leading to reduced carbon emissions. The trial's success has resulted in the technology being rolled out to other data centres across the Telehouse London Docklands Campus.



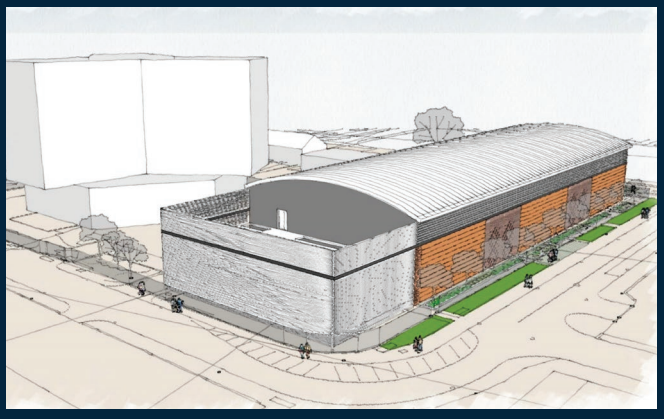


Keysource's involvement in Datum's MCR2 data centre facility

Datum, a leading colocation, cloud hosting, and data centre services provider, embarked on a groundbreaking initiative to establish a new 30,000 sq ft data centre facility, MCR2. Keysource was entrusted as the lead contractor for the design and preconstruction, supported by funding from UBS. The project aligned with Datum's commitment to delivering high-quality, resilient, secure and sustainable data centre solutions.

The MCR2 data centre set a benchmark for sustainable practices:

- **Location:** The selection of a brownfield site supported local development and regeneration plans.
- **Building materials:** Rigorous evaluations led to the adoption of alternative materials with a lower carbon impact.
- **Construction methodologies:** Approval from local authorities was secured, accompanied by a specific construction management plan.
- **Plant and equipment selection:** An ESG assessment informed the choice of low-impact products.
- **Cooling solution:** The UK market-leading PUE was achieved through high-efficiency free cooling chiller technology, eliminating the need for water storage.
- **Power solution:** Advanced battery technology and hydrotreated vegetable oil fuelled standby generator systems.
- **Biodiversity plan:** A comprehensive plan was integrated to protect nature and reverse ecosystem degradation.
- **Renewable energy:** A photovoltaic (PV) system generated over 83,000 kWh/yr, yielding an annual CO_2 benefit of over 7.4 tonnes.
- **District heat network:** The cooling system facilitated a district heat network to an adjacent housing estate, showcasing future-focused planning. Heat exchanges transferred thermal loads to the local community heating network, reducing energy needs for data centre cooling operations.



Hayes Digital Park

Colt Data Centre Services

Colt Data Centre Services is developing the Hayes Digital Park – with two data centre buildings in different stages of development and construction and a further three data centres in planning consultation.

The project demonstrates the benefit that developments can bring to a local area through effective collaboration with local government, businesses and community.

As part of the campus, Colt DCS – subject to a new planning permission – will be delivering a state of the art community facility, in partnership with Brunel University. The building will be designed to accommodate meeting rooms and workshop areas for product assembly and testing. The facility is also envisaged as a training ground for apprentices, as an extension of Brunel's Uxbridge Campus, and will house new start up tech companies formed out of Brunel University in partnership with industry.

Colt DCS has been successfully encouraging its general contractors to recruit for apprenticeship schemes locally, its own graduate program has taken 50% of its intake from Brunel University and they have been able to provide student work placements from Uxbridge College. The proposed facility would further enable Colt DCS to introduce practical training and mentoring to help bring a new generation of talent into the data centre market.

Planning

Strongly linked to the power constraints, the UK's planning system also requires reform to ensure data centres are able to reach their full potential in driving significant economic growth.

Currently, there is no National Policy Statement (NPS) on data centres – while these exist for many other infrastructure developments, such as solar and onshore wind.[36] As it stands, the current planning framework can be criticised as lacking clarity and responsiveness to the needs of digital infrastructure development. The lack of clear national planning guidance means data centres often suffer inconsistent decision-making and applications are often beset by delays, either due to a lack of resource or a lack of familiarity with this type of development.

The Government is trying to improve the current situation, providing the required clarity around data centre development. This includes the decision to designate data centres as CNI and to provide the options for data centres to go through the NSIP consenting regime, as part of the recent NPPF consultation.

These national policy changes are essential if quick progress is to be made in delivering the data centre infrastructure the UK critically needs for national security, resilience and prosperity.[37] Equally as important will be ensuring the industry works effectively with those places where data centres are located to deliver local benefits. It is clearly important that those places where data centres are positioned feel like it is worthwhile for them – whether that be in terms of revenue generated, jobs created or digital inclusion.

The challenges Local Planning Authorities (LPAs) face when deliberating on data centre developments are fully acknowledged by the industry. Funding constraints have led to cuts to planning teams, with the budgets of planning departments in LPAs having nearly halved (46%) since 2010, in order to fund other critical services.[38] These funding cuts often mean that decision-making is slow, with small numbers of full-time staff, and staff lacking the appropriate training and expertise to appropriately respond to data centre developments.

The industry wants to work with local communities to ensure that data centre developments deliver local benefit and social value, beyond local authority boundaries. As well as bespoke arrangements around individual planning applications, there is the opportunity for the sector to come together to show the value it can bring around digital inclusion and adoption.

Vital to realising local benefits is early engagement between developers, LPAs, and local communities and ensuring the broader benefits of hosting data centre infrastructure – good jobs, spillover industry growth, and sustainability improvements are fully considered and embedded within local plans.

Recommendations

Given the latest planning developments, techUK recommends the following actions to boost data centres' national economic impact:

- The Ministry for Housing, Communities and Local Government (MHCLG) should implement the proposed reforms to the NPPF, directing data centres into the NSIP consenting regime process. However, data centres developments should not be forced down this process. This direction will expand options for developers, but the option to apply directly to local authorities should be retained. In addition, the NPPF should:
  - Prioritise the construction of data centres and digital infrastructure on well-connected previously developed and Grey Belt land where possible.
- MHCLG – working with local government – should ensure appropriate resource is available to train both LPAs and the Planning Inspectorate, particularly in areas with a significant number of applications, leading to these teams having a greater understanding of the specific planning requirements attached to data centre infrastructure. This will help provide consistent decision making on data centre applications. techUK's data centre experts can support on the training and education required.
- The Environment Agency should be set clear deadlines when providing environmental permits for data centres with standby generating capacity of over 50MW. Delays in receiving these permits results in delays to planning approval.
- Local government representative bodies should establish a new forum with the data centre industry to forge closer joint working required to seize the data centre opportunity. This could include collaborating to develop a data centre social value framework.
- Mayoral Combined Authorities (MCAs) should develop specific data centre strategies that ensure data centres are central to delivering regional priorities. Linked, Local Planning Authorities (LPAs) should ensure that data centres are appropriately integrated into local plans.
- DSIT, MHCLG and DESNZ should collaborate with industry to develop clear planning guidance – through the drafting of a National Policy Statement for data centre infrastructure – providing planning guidance for data centre developers and the Planning Inspectorate.
- The industry welcomes the role that DSIT has been playing in coordinating with other government departments. We would encourage further coordination to ensure any further policy developments across areas of government remain coherent and consistent in their approach. In the past, data centres were often caught by default in numerous regulations (see our techUK 2020 report). It is therefore imperative to achieve growth objectives that various policies do not diminish these aims, and support DBT/OFI and DSIT in their efforts to promote internationally the industry in the UK and its competitiveness.

Skills

Whilst the data centre industry provides the opportunity for good and stable jobs, the industry is aware of the skills challenges it faces. 94% of data centre developers and operators report a shortage of experienced data centre construction teams.[39] Globally, companies in the broader digital infrastructure sector report an estimated shortfall of 300,000 people by 2025.[40]

This overarching challenge is the result of several different issues affecting the past, present and future workforce:

- **Ageing workforce.** Employees working in the UK's data centre industry have significant experience, having worked in the industry for many years. Whilst positive in many ways, it does run the risk of the industry losing valuable expertise over the coming years. An industry survey found that 70% of people in the digital infrastructure industry are over 45 years old, with 40% of the current workforce expected to retire within the next 15 years.[41]
- **Limited entry-level talent.** There is a lack of entry-level talent in the data centre industry. The global industry survey conducted by Uptime Institute reports challenges with staffing, with recruitment and retention rates not keeping pace with industry demand. European markets in particular report difficulties in filling junior level roles.[42] Stakeholders engaged in this project reiterated this finding, outlining that many workers entering the data centre industry are often moving across from another industry and are therefore more experienced, mature workers.
- **Lack of diversity and inclusion.** The data centre industry is facing challenges around diversity and inclusion. This includes struggling to attract and retain female talent and wider diversity, with the industry currently largely white, 45+ and male-dominated. Part of the reason for this is the traditional dominance of men in the trades, construction industry, and electrical, mechanical, construction and engineering roles[43]. Part of this is also due to the perception that hiring from outside the industry will add risk to delivery or will not have appropriate transferable skills.
- **International competition.** The talent challenge is exacerbated by the UK facing strong competition from other countries seeking to secure top class digital talent. For example, the Australian Government has made changes to their visa requirements to make it easier for digital workers to enter the country, while the Irish Government is driving a large call for digital workers. The digital infrastructure sector in the UK needs skilled workers who contribute to the digital industry. While the digital infrastructure sector does not see immigration as a stop-gap solution to our skills pipeline problem, it is a way to improve the sector.
- **Negative perceptions.** Many stakeholders engaged as part of this report suggested that work must be done to change perceptions around jobs in the data centre industry. Aside from a lack of awareness of the sector as a career choice due to its historic secrecy, some of the perceived negative side effects of data centres – including high energy usage having a detrimental effect on the environment – are pushing potential recruits away from the industry. In addition, public mentions of the innovation the sector drives, and its contributions to the digital economy, are rare.

With the industry aware of how skills constraints could diminish the industry's growth in the UK, several initiatives are being progressed to boost awareness and develop the required skills.

Ark Data Centre's partnership with ALET University Technical Colleges

To help address some of the skills challenges present within the industry, Ark Data Centres initially partnered with UTC Heathrow to contribute to their Digital Futures Programme. Ark colleagues worked with the UTC to create a 'Special Project' element to the overall course structure, designed to shine a light on the data centre industry.

The 'Special Project' focused on sustainable cooling and positioned students to learn about the evolving nature of sustainable technology, different methods of cooling, green energy, and how data centres can (and should) form a significant part of the solution. A 'Challenge Day' was also run as part of the training, which set students the task of effectively selecting a hypothetical data centre location.

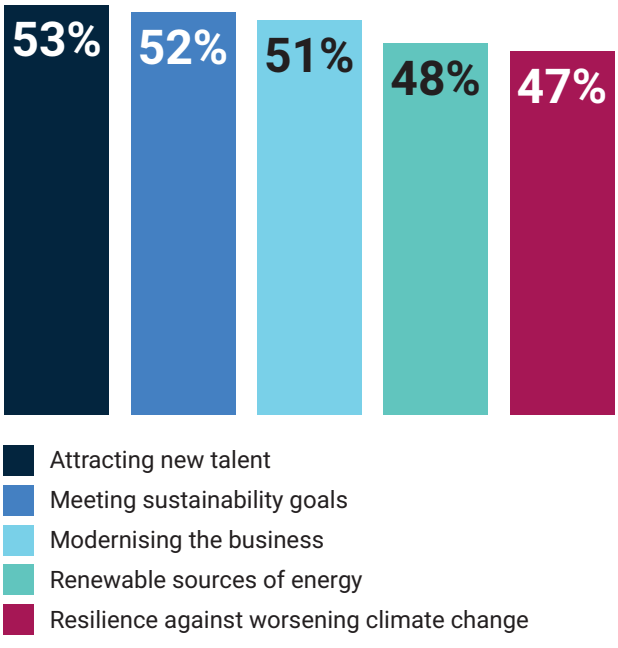
Ark's partnership with ALET now extends to their colleges in Swindon, Reading and Oxfordshire, and speaks to the industry's desire to inspire the next generation and ensure that the industry provides exciting and rewarding career pathways for all.

This includes the establishment of the National Data Centres Academy (NDCA) which – working closely with partners including the Data Centre Alliance, Innovate UK, the Coventry and Warwickshire Growth Hub, Coventry University and Warwick University – will deliver training to boost key data centre skills. In addition, HireHigher run a Rising Star Programme which is committed to supporting those in their early careers across the data centre industry by raising awareness of the sector in local schools and colleges. Over the last two years, individual companies have started apprenticeships, in partnership with educational institutions to increase their intake. Apprenticeship roles include Network Cable Installer, Maintenance Technician, Data Centre Technician, Electrical Engineer and various support roles.

If the industry is to continue to flourish here in the UK, the skills challenges will need to be addressed. The industry has made early progress in driving forward important initiatives, and it is equally vital that both central and local government adopt policies that will enable an uptick in the necessary digital and technical skills required for a successful career within the data centres industry.

The chart below demonstrates the importance businesses are placing on the need to attract new talent to the industry.

Chart 8: Factors that businesses cite as a priority for the future[44]



Recommendations

Given the latest skills developments, techUK recommends the following actions to boost data centres' national economic impact:

- The Department for Education (DfE) should engage techUK's Data Centre Council to collate insights on the high-value data centre related training that should be accessible through the Growth and Skills Levy.
- DfE should also reform the Apprenticeship Levy to cover intensive courses that focus on data centre skills.
- The industry should proactively collate and showcase non-commercially sensitive information on the good, career progressing opportunities within the data centre industry – shining a light on the positive career pathways data centres provide. This will help to raise the profile and reputation of the sector, and will aid Skills England's ambitions to map occupations onto education pathways to understand the most common pathways into priority professions.
- The industry should build on good practice of engaging local authorities and local educational institutions, and develop a systems-level approach to the education sector in order to build a comprehensive understanding of the opportunities for young people to gain experience across the industry.

Data centres in the nations and regions

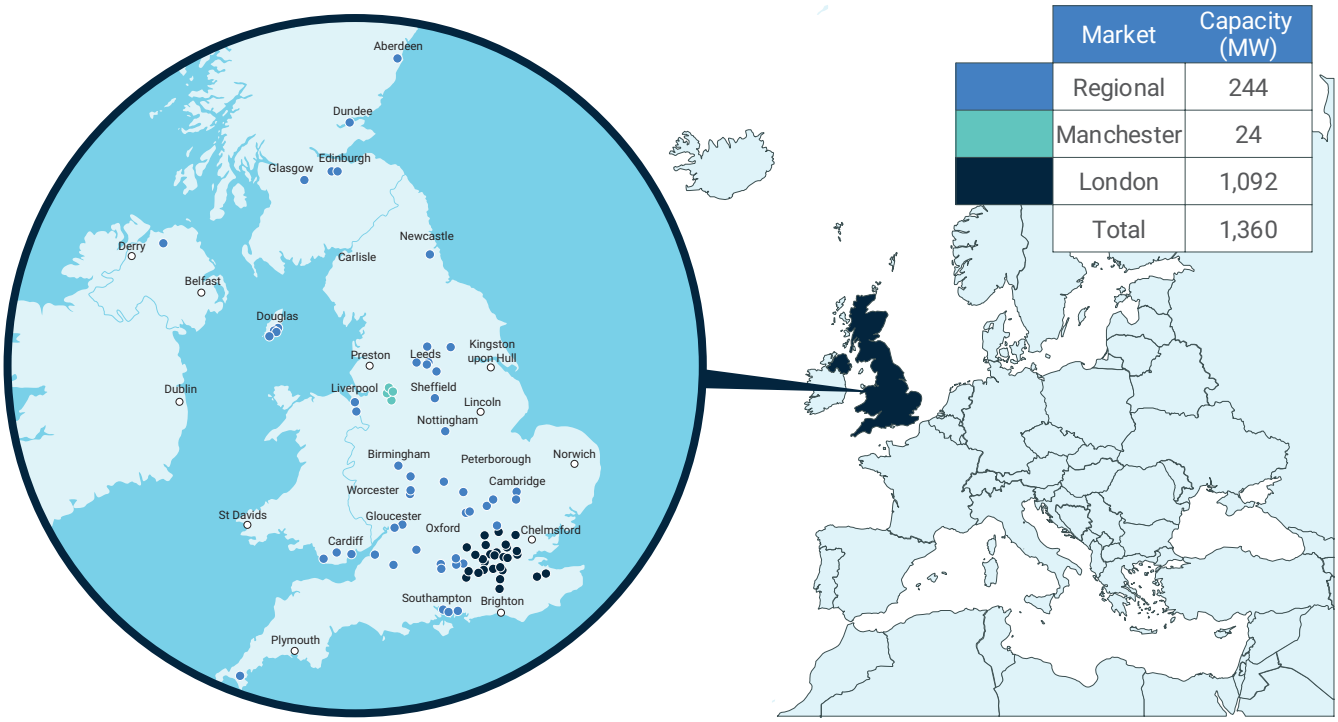
If the UK is to boost the national economic impact made by data centres, it should be clear from the themes already outlined – and some of the associated challenges – that the industry will need to continue to work effectively across the whole of the UK and with administrations in the nations and the regions to evidence local economic impact and social value.

Below, we present a new analysis on the potential for data centres within the nations and regions, providing a strong starting point for further discussions around the benefits data centres can bring to local economies.

Proximity can be an underrated factor when a business is procuring data centre services. Security and latency, as demonstrated by the rise in popularity of edge data centres, can play a critical role – although this depends to an extent on the service being provided.

This is an opportunity for places outside of the capital. **If the UK's geographic balance of data centre capacity were proportional to the UK's geographic balance of GVA, it would have an additional 3,600MW of capacity today.**

Chart 9: UK's leased data centre market by region[45]



London is the UK's primary leased data centre market with around 980MW of supply. Its retail colocation market grew out of carrier, enterprise, hosting, and Internet Service Provider demand and now services a range of customers. The wholesale colocation market has grown to service hyperscale cloud and some enterprise requirements as well as second-tier cloud providers.

Manchester is the UK's biggest secondary colocation market, currently representing around 24MW of supply as of Q2 2024.

Throughout the UK, operators have numerous data centres in different locations, making it one of the most diversified set of data centre markets in Europe. Those regional providers account for 244MW of supply spread over 60 data centres outside the London and Manchester area. Most of those facilities are in place to serve local enterprises. However, hyperscale providers like Vantage Data Centers in Newport also account for a huge part of the regional supply due to the multi-MW size of those single facilities.

Bringing our analysis to life, we have also produced three case studies to highlight the data centre opportunity and explore what further progress needs to be made to ensure data centres deliver within local communities.

The regional economic opportunity

The factors affecting where to build data centres are well-established. Land availability (and cost), access to power and the right infrastructure are key. With the availability of a skilled workforce and a customer base also being important considerations.

Taking land availability as an example, data shows that England's Combined Authority city regions have together more than 29,000 hectares (ha) of undeveloped land (see Table 2). This is the equivalent of around 35,000 football pitches. Some of this land would be unsuitable to build data centres on, as it may not have access needed for the supporting connectivity infrastructure. Yet it demonstrates that there is potential for devolved governments to take advantage of the economic benefits that the increasing demand for data centres can bring.

Table 2: Undeveloped land, split by English city region

City region	Undeveloped land (ha)
Greater Manchester	2,664
Sheffield City Region	2,799
West Yorkshire	4,625
Liverpool City Region	2,607
North East	5,872
Tees Valley	2,129
West Midlands	4,444
Cambridgeshire & Peterborough	2,307
West of England	1,724
TOTAL	**29,171**

A land area of 29,000ha could theoretically accommodate 583 large data centres (of an equivalent size to that of Havering), generating more than 350,000MW of data centre capacity (see Table 3). Of course, delivering this amount of capacity is unrealistic – it is more than four times the UK's entire generation capacity. Nevertheless, it demonstrates that there is ample land potential for data centre capacity available. Putting this another way, just 10% of undeveloped land in Combined Authority areas is enough land in theory to add 58 large data centres to the UK stock, providing 3,500MW of capacity.

Table 3: Theoretical data centre development and MW capacity on undeveloped Combined Authority land

	Large data centres that could be built on total undeveloped land area	Theoretical MW provision
Greater Manchester	53	31,968
Sheffield City Region	56	33,588
West Yorkshire	93	55,500
Liverpool City Region	52	31,284
North East	117	70,464
Tees Valley	43	25,548
West Midlands	89	53,328
Cambridgeshire and Peterborough	46	27,684
West of England	34	20,688
TOTAL	**583**	**350,052**

Regional impact studies

The quantitative evidence presented so far demonstrates the additional impact data centres could make within the nations and regions. However, data only presents part of the story and three case studies for different parts of the country have been developed for this report to provide further qualitative insights into data centres' impact within the nations and regions.

For the purposes of this report, West London and Slough, Greater Manchester, and Cardiff and Newport, have been selected as case studies. This is due to their differing stages of data centre maturity providing an important view on what can be done to support nations and regions at different stages along their data centre journey.

However, as exemplified by Pulsant's case study below, data centres are providing innovative solutions to cutting edge technologies right across the UK.

Pulsant in Rotherham and Milton Keynes

Pulsant

Pulsant effectively collaborated with LinkPool, a smart contract infrastructure provider, to bridge the gap between data sources and cryptocurrency contracts.

Smart contracts require real-time data to function effectively, and ensuring 100% uptime was crucial. As LinkPool grew, it encountered scalability issues and rising costs.

By colocating in two of Pulsant's regionally connected data centres, Rotherham and Milton Keynes, LinkPool gained the flexibility to design a tailored, powerful, cost-effective, and highly scalable technology suite.

The Rotherham data centre allowed for rapid infrastructure deployment and hands-on oversight. Additionally, Pulsant's high-speed intra-data centre network facilitated the launch of a second production environment in Milton Keynes, enhancing network resiliency and uptime assurance.

West London and Slough

This data centre region is the most mature of the three case studies presented in this report and provides useful insight into what more can be done to alleviate some of the resource pressures faced when hosting data centre infrastructure.

Data centres in this region have been steadily growing since the computer boom of the 1990s, with the region's proximity to transatlantic telecommunications links, City of London and Heathrow Airport among the key pull factors for data centres, as well as the availability of power via the old Acton power station. In addition, the tech cluster development in the 'M4 Corridor' has also presented another attraction for data centre developments, with a high density of digital and tech companies and tech talent in the region helping to deliver agglomeration benefits. The transition to AI computing has spurred a drive for purpose-built locations within the region in recent years.

The state of play

There are 22 known data centres in the boroughs of Brent, Ealing, Hillingdon and Hounslow, with the Old Oak and Park Royal Development Corporation (OPDC) area home to at least eight more purpose-built and retrofitted facilities in operation or under construction. Major global providers such as Vantage, Equinix, Microsoft, and CyrusOne have all established data centres in the region. Colt Data Centre Services (as referenced earlier) acquired land in April 2021 for a new data centre campus in Hayes which will become one of the largest in the UK and SEGRO has received planning permission for a new centre at Thorney Business Park.

The data centre market within West London in particular is beginning to reach saturation point. Power availability in the boroughs of Brent, Ealing, Hillingdon and Hounslow is increasingly constrained, with low land availability and high associated costs exacerbating planning challenges within the region. The Greater London Authority (GLA) has been working closely with boroughs and operators to put short-term mitigations in place and to accelerate timelines for capacity enhancements, but the latter will still take several years to resolve.

In parallel, to support West London's decarbonisation and growth ambitions, the West London Alliance, in collaboration with its seven London boroughs and the GLA, has produced West London's subregional Local Area Energy Plan (LAEP) – the first of its kind in London. To be delivered in two phases, this will lay out the scale and scope of West London's net zero challenges, including on grid capacity, and identify necessary solutions. While the LAEP provides a crucial part of the evidence base for better electricity network planning by operators, it cannot fully help to plan for data centre development without a better understanding of future demand.

Actions to consider

Local government colleagues engaged were clear that further strategic thinking would be beneficial in better understanding the demand for data centre infrastructure within the region, and that there were local impacts which need to be better managed in collaboration between developers, local authorities and utilities. They would like to see developers being proactive in approaching utility networks and local authorities to discuss how data centres can deliver benefits to local areas and communities – such as by supplying local heat networks, providing affordable workspace, enabling employment, skills and training opportunities and potentially contributing to high-growth clusters if there are sectors requiring proximity to data centres. It will also be essential to ensure that the design of data centres contributes positively to the built environment. Notably, OPDC is using £36 million of Government funding to construct a heat network using waste heat from data centres to heat over 10,000 homes and 250,000 m2 of commercial space. This is a good example of data centres being effectively considered within broader infrastructure ambitions.

Important lessons could be learnt from the Slough Trading Estate which has been designated as a Simplified Planning Zone (SPZ) since 1995. The SPZ is a form of flexible planning consent developed through a successful partnership between Slough Borough Council and SEGRO. Development delivered under the SPZ has enabled a range of businesses, including a high number of data centre operators, to thrive. It has also secured significant investment in local infrastructure, environmental projects and training programmes to support the community. However, whilst intended as an enabler of faster investment and planning decisions, the SPZ approach could make it more difficult for utility networks to plan and manage investment proactively to keep pace with the growing demand.

Greater Manchester

As constraints began to be faced within West London, the data centre industry started to turn towards other parts of the UK with the necessary characteristics to support development. Greater Manchester has proven a popular destination for many within the industry, with benefits including good land availability, access to one of the fastest growing digital and tech hubs in Europe, and existing large fibre connections. Other characteristics, including spare capacity in the grid when compared to London, also help the region stand out as an alternative to West London.

Importantly, the region has a strong talent base with 29,000 STEM students calling Greater Manchester home. Moreover, the region is now outperforming many of the emerging fintech cities such as Lisbon, Rome, Brussels and Warsaw, raising £1.8 billion in venture capital funding in the five years to 2023[46]. This means that there is a developing skills base in Greater Manchester to both create a customer demand for data centre services, and the skills to build and operate data centres. The potential agglomeration benefits within the region are significant.

The state of play

There are currently at least 27 data centres with more in development, with Greater Manchester the second largest data centres hub in the UK.[47] Equinix has several sites and other developers like Pulsant, DeepGreen and ANS also have sites in the region – representing a mix of colocation and edge facilities. The Kao Data Centre in Stockport received planning permission earlier in 2024 and construction has now commenced. It is built with capability to support AI and High Performing Computing (HPC) and will be the largest facility in the north of England once operational.

There has been a clustering of data centre sites to the south of Manchester city centre in Trafford Park and Salford Quays, important additions in the wider redevelopment work in Greater Manchester. There is also a group of data centres in Hulme, just north of Moss Side, and Manchester Airport's City Enterprise Zone.

Actions to consider

Despite the growing maturity of Greater Manchester's data centre industry, the city region is yet to take a proactive approach to data centre development. This is likely to change over the coming years with local government having a clear awareness of increasing demand for data centres and the need to develop a strategy for Greater Manchester that ensures data centres align to regional priorities. The Greater Manchester Combined Authority (GMCA) is leading this strategic work at a city region level.

As in West London, local government stakeholders were clear that the industry would benefit from greater collaboration with local government to further understand the local economic benefits and social value that data centres deliver. There is also the potential to align data centre development with other ambitions for the area, such as Atom Valley.

Cardiff and Newport

This data centre region is relatively early in its data centre journey compared to the two comparator regions above. There is a real opportunity within the region to use data centres as an opportunity to deliver important regeneration outcomes, repurposing existing infrastructure – with grid connections secured – previously used as part of the region's traditional industry strengths.

Like West London, Cardiff and Newport benefit from the tech industry's clustering around the M4 corridor, the 'Silicon Valley of the UK'. It has good connectivity to London, trans-Atlantic cables and good transport links, whilst avoiding the comparatively high costs of being in or near the capital. South Wales as a wider region is home to vibrant tech and engineering clusters. Firms present include Raspberry Pi, Toyota, Airbus, Thales and a range of semiconductor manufacturers – including Newport Vishay, and IQE. The region also plays host to the UK Catapult for Compound Semiconductor Applications.

The state of play

There are three dominant scaled data centre developments in the region, including Vantage Cardiff (CWL1), the biggest data centre campus in Europe. There is an additional Vantage data centre in development, whilst Microsoft has submitted plans to convert a site formerly occupied by a radiator company into a data centre campus. Microsoft's plans were approved by Newport City Council in July 2024.

Due to a current focus on developing data centres on existing legacy brownfield sites, data centre development is able to move forwards alongside other critical infrastructure requirements, such as housing, energy and transport.

Actions to consider

The challenge for the region will be balancing the fact that there are only a certain number of land assets available. As such, there will need to be an informed decision around the different types of infrastructure that have interests in the finite amount of land assets available.

To aid decision-making, there needs to be more robust evidence around data centres' potential economic impact; previous impact evidence ought to be strengthened; and there needs to be a stronger understanding of primary data underpinning data centres' economic forecasts. Importantly, data centres should be understood as enabling other areas of growth for the wider Welsh economy and unlocking high-tech opportunities.

Conclusion

Data centres are fundamental infrastructure to the UK economy, and deliver significant economic impact at local, regional and national levels. As enablers of digital transformation across all sectors of the economy, they induce major benefits in terms of GVA and employment.

There is a huge opportunity for the UK to grasp, with the potential for £44 billion additional GVA (from data centre construction and operations) between 2025 and 2035.

Meanwhile, the industry is proactively addressing concerns by leading on important innovations and initiatives that are making data centres ever more resilient, sustainable and efficient.

However, the sector faces challenges that must be overcome if the UK is to ensure that the critical role they can play in enabling and driving economic growth is to be fully realised. These challenges include the need to deliver the power required to realise the benefits of AI; overcome planning challenges; address the industry's current skills gap; and continue to ensure resources required are used in the most sustainable manner. At the heart of these challenges is the need for further collaboration between the industry and both central and local government.

Failing to act on these challenges runs the risk of reputational damage for the industry and reinforcing some of the negative data centre stereotypes. For the UK, failing to provide further industry support will result in significant investment moving overseas and the loss of its role as a global leader for data centres.

If progressed, the recommendations – developed by Henham Strategy and techUK, in partnership with its members – will not only resolve the challenges identified in our research but will pave the way to boost data centres' economic impact here in the UK. We look forward to taking them forwards, effectively collaborating with industry and both central and local government.

Notes and references

Annex I sets out the methodology and observations on measuring the economic impact of the data centre industry in more detail and can be accessed here.

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7 This is simply total capacity of data centres within the DC Byte sample, divided by the number of data centres, with the same calculation applied from data using ColoX. Whilst 6.3MW has been recorded as the average UK data centre capacity, it should be noted that current requirements are much greater than this, with 1GW data centre projects now being considered. It should also be noted that not all capacity would be used, with some anecdotal evidence that 50% capacity is used, putting this estimate in line with estimates of the energy consumption of UK data centres.

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