EAC Inquiry Response: Risks and opportunities to the sustainability of data centres in the UK

April 2026

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The following response provides answers to Questions 3, 4, 5, and 9 posed in the Environmental Audit Committee's inquiry on the risks and opportunities to the sustainability of data centres in the UK. This response has been developed by Sofie Surraco, Clara Son, and Nick Scott, researchers associated with the Centre for Climate Engagement at Hughes Hall, University of Cambridge. The authors draw on expertise in environmental law and governance to inform policy solutions, as part of a programme of work at the Centre which focuses on the governance of artificial intelligence's environmental risks and opportunities.

Summary

Our response centres on how legal and policy frameworks intersect with data centres' environmental impacts. We submit that data centres are already impacting a variety of environmental policies, targets, and mechanisms, but that a more coordinated government response could help the UK achieve its environmental goals while meeting its technological ambitions. In particular, we note that:

- Data centres' significant energy consumption could threaten the Government's Net Zero targets if not properly managed. While this is somewhat dependent on broader decarbonisation efforts, projections suggest that AI-related growth in data centres could create energy demand that outpaces clean energy rollout, potentially prolonging reliance on gas-powered generation.
- Current UK policy and planning frameworks may struggle to coherently account for the environmental impacts of data centres. Existing regimes assess projects in isolation, with no mechanism to consider interdependencies between data centres and their supporting infrastructure. Without such a strategy, planning authorities face the risk of legal claims based on data centres' environmental impacts.
- Gaps in data, disclosure and carbon budgeting undermine the Government's ability to accurately assess and manage emissions. Data centres are not meaningfully incorporated into current carbon budget modelling, and existing reporting mechanisms rely heavily on voluntary and self-regulated disclosures.
- The absence of a coordinated national strategy or institutional oversight creates governance gaps across energy, planning and environmental regimes. Responsibilities are fragmented across multiple bodies, with no single entity tasked with tracking and managing the sector's system-wide impacts. There may be scope to establish a clearer coordinating function or regulatory body to oversee data centre development and its cross-cutting environmental implications.
- International experience highlights acute energy- and water-related stress from data centres, and the risk that private measures taken to address this do not decrease the demand for these resources, as seen in the US. Measures from other jurisdictions, particularly China, indicate a potential for centralised strategies which locate data centres in regions with abundant clean energy resources. The EU's AI Act reveals opportunities for the UK to better integrate environmental concerns into comprehensive AI regulation.

Question 3: What impact are data centres having on climate change and the Government's Net Zero targets and how will this change in the short, medium and long term in the UK?

The UK is home to approximately 450 large data centres, with a total installed capacity of around 1.8 GW as of 2024.[1] Data centres currently consume around 2.5% of all UK electricity,[2] with most energy directed at server computing and cooling. Despite its industry leadership, there are significant gaps in measurement and disclosure on the true emissions impact of the UK's data centres.[3] Although some major operators have committed to achieving renewable energy and sustainability targets – some as early as by 2030 – these remain largely voluntary and self-regulated. The mechanisms used to meet these commitments also warrant scrutiny; power purchase agreements (PPAs), the primary instrument through which operators claim clean energy credentials, largely operate at the procurement level rather than the systems level, and studies have found that a significant number of PPAs deliver negligible emission benefits.[4] Unabated, the gap between reported and actual carbon performance has severe implications for climate change commitments. As the UK government pursues its statutory commitment to achieving net zero greenhouse gas emissions by 2050 under the Climate Change Act 2008, and its interim target of an 81% reduction in emissions by 2035 per the Seventh Carbon Budget,[5] the credibility of those commitments depends greatly on more rigorous auditing and transparency of data centres' cumulative environmental impacts.

November 2025 research finds that the data centre sector's electricity consumption is expected to rise four-fold by 2030.[6] Preliminary Government estimates suggest UK data centre capacity could reach between 3.3-6.3 GW by 2030, depending on the level of policy intervention. DSIT's July 2025 Compute Roadmap[7] forecasts that the UK will need a minimum of 6 GW of AI-capable data centre capacity by 2030 – representing a substantial proportion of the UK's average electricity generation of around 27 GW.

This trajectory poses a material risk to the UK Government's Clean Power 2030 objective. If clean power rollout does not keep pace with surging demand, data centres could effectively prolong the use of gas-powered infrastructure – either by requiring more gas capacity to remain on the grid or by incentivising operators to generate fossil fuels on-site. Carbon Brief analysis suggests that if even a modest proportion of new data centre electricity comes from gas-powered generation, cumulative CO_2 emissions could be "hundreds of times higher" than current Government estimates.[8]

We believe the EAC should critically review the findings set out in the *Big tech data centres: A threat to UK decarbonisation* report[9] from Foxglove and Global Action Plan. Data centre developers have themselves estimated that just ten of the larger planned data centres in the UK are expected to bring over 2.7 million tonnes of CO_2 equivalent[10] – roughly equivalent to the annual carbon savings from the public's switch to electric vehicles. Each planning approval made without robust emissions accounting may increase the stock of locked-in energy demand within the Clean Power 2030 target window. This target is already finely balanced, depending on a specific set of assumptions about demand growth, grid decarbonisation, and the pace of renewables deployment. A surge in data centre demand – particularly from AI workloads, which are less predictable and more energy-intensive than conventional computing – threatens to push demand beyond the levels the 2030 trajectory was modelled on. The deliverability of Clean Power 2030 requires an urgent assessment of the regulatory and planning framework, to ensure the emissions and demand footprint of data centre development is accounted for before the pipeline is built out and locked in.[11]

Data centres' interaction with UK climate policy will continue to be complex in the medium term. The Seventh Carbon Budget (CB7), which covers 2038-2042, represents a critical policy instrument for this period. Importantly, the draft CB7 released in February 2025 does not reference data centres and includes no modelling on likely impact on emissions precisely during the period when their

energy demand is projected to be at its maximum.[12] Without proper accounting of these potential emissions pathways, the risk of carbon lock-in before the end of the decade is substantial. Large data centres typically involve physical infrastructure with operational lifespans of 15-25 years, and infrastructure decisions made in this decade will determine carbon obligations that persist far into the period covered by the Seventh Carbon Budget. A recent report from the London Assembly[13] warned that the energy demand from data centres in Greater London is forecast to increase between 200-600% in the medium term. If the emissions implications of this expansion are not accurately modelled and incorporated into planning frameworks in the more immediate term, the UK Government could find itself, through its own planning decisions, committed to an already-unachievable target.

Over the long term, data centres' compatibility with net zero is possible but not assured. Whether data centres become a serious climate liability or a well-mitigated challenge depends significantly on how quickly the UK grid decarbonises. Without the necessary policy intervention, these critical national infrastructure projects risk becoming an emissions source requiring costly offsetting over the decades to come.

Question 4: To what extent will Artificial Intelligence (AI) accelerate the need for data centres and is this being adequately taken account of by the Government and relevant bodies, such as the Climate Change Committee and the Office for Environmental Protection, in terms of nature, the environment and climate change?

The UK Government's goal to increase public-controlled AI computing power twentyfold by 2030, as outlined in the AI Opportunities Action Plan,[14] is likely to raise energy demand and consumption.[15] Estimates from the 2024 *International Scientific Report on the Safety of Advanced AI* suggest that developing the most sophisticated AI systems currently requires a four-fold increase in the amount of annual computing power of data centres.[16] The report explains, "AI likely accounts for well under half of data centre electricity consumption currently, but if the rapid growth of AI's computational requirements continues, AI could become the primary consumer of data centre electricity over the coming years and increase its share of global electricity demand."[17] The growing market presence of devices that use AI (e.g. smart home sensors, routers, social media platforms, etc.) presents additional energy demand. Despite challenges related to reporting and disclosure, it is important that the UK Government and relevant bodies take a whole-lifecycle approach to accounting for AI technologies' impact – particularly as the development of these continues to outpace energy efficiency improvements. We urge the EAC to also consider the rise of agentic AI models, and the potential for these emerging use cases to lead to non-linear increases in energy and natural resource demand.

While establishing them as "a key part" of its AI Growth Zones agenda,[18] the Government has set out relatively limited support for data centre developments that prioritise environmental impact mitigation. According to its AI Growth Zones application criteria, while sites located near land suitable for the development of low carbon power generation "will be viewed favourably", the Government will not readily accelerate power connection timelines or grid connection.[19] This points to a potential mismatch between ambition and delivery levels; AI's growing energy demands "could exacerbate competition for limited renewable energy resources"[20], which in turn risks increasing reliance on fossil fuels and raising emissions levels.

These concerns may be relevant to the Office of Environmental Protection (OEP), considering its statutory remit to ensure government and public authorities are complying with environmental law

– which under the Environment Act 2008 includes areas such as air and water quality, climate change mitigation, waste and resource use. The OEP could be empowered to conduct a thematic review of data centre development in the UK and its implications for existing environmental obligations.

In lieu of significant *ex ante* regulation of data centres' sustainability, the courts are playing a role in managing AI's environmental impacts. In early 2026, a legal challenge was brought against the UK Government for failing to conduct an EIA prior to granting planning permission for the West London Technology Park (WLTP) hyperscale datacentre project, raising significant concerns around the lack of environmental due diligence.[21] This litigation sits within a wider legal landscape shaped by the Supreme Court's landmark ruling in *Finch v Surrey County Council*,[22] which established that a project's downstream environmental impacts must be considered in planning decisions. Proactive regulation to ensure data centres mitigate environmental impacts may help avoid this type of environmental litigation, which can be costly and time-intensive for both the government and developers.

Again, many of these challenges can be mitigated through better prioritisation of data gaps. As mentioned, the CCC's carbon budgets and sector pathways have not, to date, incorporated assessment of data centre emissions. The EAC Chair wrote to Energy Secretary Ed Miliband in early 2026[23] to highlight the insufficient focus on data centres in the draft Seventh Carbon Budget,[24] to which the response was that future demand remains "inherently uncertain".[25] This represents a potential continuation of the issue – uncertainty about the scale of the risk is a reason for more explicit scenario analysis, not for omitting the risk category from carbon budgeting. We recommend that the CCC be formally tasked with producing a dedicated emissions assessment of AI and data centre demand as a cross-cutting risk to statutory carbon budgets, working with NESO to produce scenario modelling and stress-testing across different AI adoption pathways. This is likely to require working more closely with industry partners and AI developers to better understand how environmental footprint data is being collected, measured, forecasted, and reported on.

A priority recommendation would be to identify how this relationship can be brokered through a better-defined coordinating function. NESO has for years raised more foundational concerns around the lack of a government agency tasked with tracking the AI industry.[26] Existing initiatives such as the AI Energy Council (AIEC), and its founding aim to facilitate collaboration between the AI and energy sectors, could be leveraged. From available information there is on the AIEC's work to date (see meeting notes[27]), it is evident that focus has been largely on energy supply and grid connections, with comparatively limited focus on environmental governance concerns. There may be scope for greater clarity on how the AIEC can address these policy concerns.

Question 5: To what extent do existing policies, such as the Environmental Improvement Plan and the Planning and Infrastructure Act and associated policies, take account of the potential impact of data centres, particularly in terms of water use, nature and the environment?

Current policies largely fail to recognise data centres as a novel environmental pressure. The Environmental Improvement Plan does not identify data centres as a source of pressure on water, nature or wider environmental quality, nor does it discuss their energy or resource footprint as an issue to be managed. Its only substantive reference to AI is in presenting it as an innovation opportunity to improve environmental monitoring and regulation, specifically in using AI systems and remote sensing to enhance diagnostics and surveillance for pests. Similarly, the Planning and Infrastructure Act does not treat data centres as a distinct infrastructure category with specific

environmental risks. The Act contains no explicit references to data centres or AI as drivers of water use, nature impacts or local environmental degradation. As noted above, data centres' environmental impacts may nonetheless be relevant to planning decisions and judicial reviews brought against them.

Question 5a: How should the impact of data centres be factored into future policies, such as the Land Use Framework, regional planning, housebuilding and reform of the water sector?

Data centres represent a novel category of infrastructure whose resource demands do not necessarily map neatly onto existing planning policy frameworks.

The Land Use Framework

The Land Use Framework makes no meaningful provision for data centre infrastructure, despite its growing implications for land requirements, grid infrastructure, and competition with other land uses including housing and agriculture. There is no strategic basis for resolving trade-offs, meaning that conflicts are currently resolved on a case-by-case basis. We see this playing out with the approval of data centres on green belt land, as seen at Courts Lane in December 2024, Abbots Langley in May 2025, and Woodlands Park in July 2025.[28]

More broadly, the Framework's "right use, right place" principle could be applied more methodically in the context of infrastructure-intensive development including data centres. Local and regional planners could be encouraged to account for the full infrastructure envelope (e.g. grid upgrades, cooling infrastructure, transport links, etc.) when allocating or safeguarding sites, rather than assessing only what falls within the building's planning application boundary.

Regional planning and the NPPF

Following December 2024 reforms to the National Planning Policy Framework (NPPF) – which applies in England only – local authorities are now required to consider the need for data centres when setting local policies and deciding planning applications. This change remains focused on removing barriers to development rather than managing data centres' cumulative impacts. In the Government's own consultation on the proposed NPPF draft, it is explained that "the planning process for renewable energy infrastructure to support data centres for AI workloads is likely to be separate to planning application for the data centre itself"[29]; data centres are typically consented locally under the Town and Country Planning Act 1990 (TCPA), while their supporting energy infrastructure falls under the national Nationally Significant Infrastructure Project (NSIP) regime.[30] The result is that a data centre and its power supply may be subject to separate consenting regimes, with no mechanism under the current framework to consider the two together or account for interdependencies.

The AI Growth Zones initiative represents the most substantive policy response, although this remains primarily an investment facilitation tool; it does not set binding efficiency standards, and does not require developers to demonstrate water or energy sustainability as a precondition of planning consent. Many local plans continue to assess data centres ad hoc against general local industrial policies, which may not adequately account for their cumulative resource intensity. The NPPF could be updated so that in areas likely to attract data centre investment, local plans are required to allocate land more proactively and safeguard energy, as well as green, corridors. Opportunities to introduce provisions that help support grid resilience, e.g. recycling waste heat from data centres into district heating systems to support new housing development,[31] are underexplored. There is a strong case for statutory consultation requirements to be strengthened so

that National Grid ESO, Ofwat, and other relevant actors are formally engaged at the regional planning stage, not just at the point of a specific data centre planning application.

Water sector reform

The January 2026 Water White Paper,[32] which sets out an ambitious reform programme including plans for a new single regulator to replace Ofwat and a 25-year National Water Strategy, does not address data centres as a demand-side pressure. The Environment Agency (EA)'s own National Framework for Water Resources has acknowledged that reliable data on data centres' water use "needs to be considered when data centres are being planned", but that they are facing barriers in gaining information on water consumption.[33] In July 2025, the EA stated that because data centres are not required to record the amount of water they use to cool their servers, the government is unable to predict how much water these centres will require over the coming decades and therefore future shortages could be more severe than currently predicted.[34] The Royal Academy of Engineering has called on the Government to mandate water consumption reporting for data centre operators,[35] and we encourage the EAC to take seriously the risks of delaying progress in this area.

The common thread across these frameworks is that they are being asked to accommodate data centre impacts reactively and through instruments designed for different purposes. None of these frameworks can provide the consistent national baseline against which all data centre development is assessed, regardless of location or the particular local authority or water company involved.

Previous attempts to introduce AI-specific legislation have showcased this issue. The UK AI (Regulation) Bill,[36] as it was introduced, was primarily concerned with model safety, copyright and establishing the AI Authority body – the regulatory principles it set out did not focus on the physical infrastructure underpinning AI systems. If a similar future policymaking effort included a duty on the proposed AI Authority to assess and report on environmental implications of AI's infrastructure, it may create an institutional mechanism for bridging model-level governance and infrastructure-level governance. A dedicated, cross-cutting infrastructure framework that sets national standards, establishes a clear data centre location strategy, and creates a regulatory body with the authority and information to manage cumulative impacts could fill some of the decision-making gaps identified throughout this response. This infrastructure framework should not replace or override the Land Use Framework, regional spatial strategies, or water sector reform, but may be a material consideration for which those frameworks are required to account.

Question 5b: How important is the location of data centres and what factors should be considered for optimum siting of them?

Research cautions that the proliferation of AI data centres worldwide could lead to what is known as the data heat island effect, with estimates that land surface temperature surrounding AI data centres increases by 2°C on average due to increased energy demand.[37] This may present a range of environmental risks to local communities.

There is existing research on the importance of the location of data centres specifically within the UK context, including a March 2026 report from the University of Exeter on GIS-driven regional assessment for sustainable data centre siting in the UK.[38] This comprehensive report outlines a GIS-based multi-criteria decision analysis (MCDA) framework for regional data centre suitability screening, focusing on factors including:

- **Climate indicators** (e.g. temperature, humidity, air frost days, and solar radiation)

- **Infrastructure and environmental constraint indicators** (e.g. grid access, power demand, transport proximity, environmental protections, water stress, flood risk, hazard exposure, protected areas, and population distribution)
- **Other constraint indicators** (e.g. legal compliance, operational budget caps, data latency)

The report asserts that data centre location plays an important role in determining energy efficiency, environmental footprint, and long-term operational resilience,[39] and its MCDA framework may help support data-backed decision making on optimal sitings of UK data centres. We would urge the EAC to review these recommendations.

Question 9: Are there beneficial or precautionary lessons to learn from the impact of data centres outside the UK?

Data centres' environmental impacts are relatively similar across jurisdictions, though legislative and regulatory approaches to managing them vary.[40] We outline selected experiences and approaches from major economies below, with a particular focus on the United States.

United States

In 2024, natural gas supplied over 40% of electricity, while renewables supplied about 24%.[41] Michael Eugenis, the director of resource planning at Arizona Public Service, the state's largest utility, confirmed that due to the demand from data centres, fossil fuel capacity is increasing beyond stated thresholds.[42] Analyses of US siting patterns highlight clusters in Arizona, Texas, California, and northern Virginia, where cheap land, tax incentives, existing fibre and power infrastructure, and favourable utility tariffs have attracted hyperscale investment despite groundwater depletion and recurring drought.[43] A Bloomberg analysis finds that more than 160 new AI data centres have been built in the past three years, roughly two-thirds of them in areas with high competition for scarce water, representing a 70% increase over the prior three-year period.[44] In Texas, hydrologists warn that a surge of AI campuses layered onto already stressed aquifers could significantly raise statewide water demand. In the Phoenix metro area, a Ceres-backed assessment classifies the region as "severely water-stressed" and estimates that completing all planned data centre projects could increase annual water stress by roughly one third.[45]

Recent modelling of AI server deployment across the United States estimates an annual water footprint of 731–1,125 million cubic meters between 2024 and 2030,[46] around 70% of that footprint arises offsite through electricity generation rather than direct cooling – and this indirect footprint varies sharply across US grids.[47] Analysis of regional electricity mixes show that the electricity water intensity factor (EWIF) differs by an order of magnitude between regions dominated by thermoelectric and hydropower versus those with high shares of wind and solar. For instance, work on data centre siting in Texas indicates that meeting projected AI loads with natural-gas-dominated generation could require roughly 50 times more water than using solar, and 1,000 times more than using wind, underscoring how grid composition and siting decisions jointly shape AI's indirect water use.[48] In the US, detailed water use data is frequently shielded as confidential business information, especially where data centres purchase water through municipal utilities that do not publicly disaggregate large industrial customers.[49]

In response to environmental concerns, there has been an emergence of "Green AI" – advertising more efficient chips, advanced cooling and water-reuse systems, renewable-energy procurement, and "water positive" pledges. In some cases, these engineering fixes directly enable rebound effects, freeing up capacity that is then used to support more AI workloads and higher absolute water

withdrawals. Water-positive pledges typically measure "positivity" through volumetric accounting, which tracks the physical volume of water used or produced: companies fund projects such as wetland restoration, agricultural efficiency upgrades, or leak reduction efforts and claim credit for the estimated water "returned" to nature or communities.[50] However, several features of these schemes limit their capacity to govern AI's water footprint. Water reuse projects often occur far from the data centres whose withdrawals triggered public concern. This process has been coined as replacing wet water with 'paper' water – a tactic where paying for consuming wet water, or offsetting it in another way, has been used to deplete groundwater throughout the world, resulting in the net depletion of groundwater under the guise of water positivity.

Certain US states have seen proposed legislation to better manage water- and energy-related risks associated with data centres, as well as advocacy and litigation targeting specific developments. The broader impact of these measures may be limited given the country's federal structure, as developers may simply decide to site data centres in states without significant regulatory or litigation risk. The UK's political structure does not create these same issues, but there may still be risks of 'carbon leakage' if data centres are sited abroad in response to regulation in the UK.

China

China's leadership has been explicit in tying the growth of AI to environmental ambitions,[51] though the country's continued reliance on coal may threaten the reconciliation of these two goals. To address this tension, China has aimed to adopt a strategy of "Eastern Data and Western Computing",[52] in which data centres are sited in areas with abundant clean energy sources and natural cooling, largely in the West of the country, to serve demand for digital resources largely coming from the country's highly-populated regions in the East. Despite being a much smaller country, the UK could nonetheless consider a similar centralised strategy for locating data centres. While existing data centres are mostly centred on industrial and commercial hubs in England, future development of data centres could instead be focused on regions of Scotland, for example, with access to a significant amount of renewable energy. China has deployed additional regulatory mechanisms such as its Special Action Plan for Green and Low-carbon Development of Data Centres, which set standards for computing efficiency and renewable energy thresholds.

European Union

The EU's AI Act is arguably the most comprehensive piece of AI legislation globally and aims to address a wide range of risks stemming from the growth of AI, while capitalising on opportunities from these emerging technologies. The Government may aim to replicate certain aspects of the AI Act but should also consider precautionary lessons. While the AI Act does consider environmental issues at various junctures, it does not account for environmental impacts when considering whether a general-purpose model poses "systemic risk".[53] Energy usage is one potential indicator of systemic risk, but only as a proxy for the overall size of the model. If the UK implements similar legislation, environmental risks outlined in this response could be more closely integrated with the legislation's broader aims. Political backlash against the EU's AI Act may also indicate difficulty in balancing environmental concerns against other goals of AI regulation. Laws which are seen to overburden businesses or slow the development of a domestic AI industry may struggle to gain widespread approval from industry and the public. As the UK faces many of the same geopolitical risks as the EU, and similar concerns around economic competitiveness, the way in which EU policymakers manage these tensions may inform the Government's approach to including environmental provisions in comprehensive AI regulation.

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