APPENDIX: AI and Data Centre Water Footprint in the UK: Strategic Recommendations for UK Government

Introduction: Securing Sustainable AI in a Water-Stressed UK

Artificial Intelligence (AI) is reshaping industries and public services, with the UK investing heavily to become a global leader in the field. However, this growth carries a substantial, often underestimated environmental burden particularly its water footprint.

AI's reliance on high-powered data centres requires significant water for cooling and energy generation. With the UK already facing a projected daily water deficit of 5 billion litres by 2050, AI infrastructure risks worsening regional water stress, undermining environmental and social commitments and threatening both environmental resilience and economic growth.

Current planning frameworks including 2025 water resource plans fail to adequately account for the water demands of data centres. This creates a critical policy gap. Urgent action is needed to embed sustainable digital development into national infrastructure planning.

Strategic Recommendation 1: Mandate Transparency and Accountability in AI Water Use

Why this matters:

The rapid growth of AI infrastructure is being fuelled by hyperscale data centres, which consume enormous volumes of water primarily for cooling servers and generating the electricity they require. Despite this, there is currently no reliable dataset on the total water use of data centres in the UK. Only two-fifths of operators actively track their water use, and voluntary transparency is not sufficient to meet public accountability standards or support regulatory planning.

This opacity creates systemic risks: regulators cannot plan for infrastructure needs, local communities are unable to assess environmental impacts, and policymakers lack the data required to assess whether growth is sustainable. The disparity between rising water consumption and public visibility undermines confidence and trust.

Mandatory, location-specific reporting would ensure that data centres in water-stressed areas are recognised as high-impact, and enable government and utilities to target mitigation where it's most needed. The EU's Common Union Rating Scheme already offers a precedent for such a mandate.

Actions:

1. Introduce mandatory, location-specific reporting of water, energy, and carbon use for all UK-based data centres above 1MW.
2. Require breakdowns by source (potable vs. non-potable) and integrate reporting into planning consents.
3. Align reporting standards with EU Common Union Rating Scheme to ensure comparability and compliance.

Strategic Recommendation 2: Integrate AI Infrastructure into National Water Planning

Why this matters:

The UK is already facing a significant water deficit projected at nearly 5 billion litres per day by 2050 driven by population growth, climate change, and ageing infrastructure. Despite this, national and regional water resource management plans do not currently include AI infrastructure in their demand forecasts. This omission is particularly problematic given that a single 100MW hyperscale data centre can consume around 2.5 billion litres of water annually.

Water planning in the UK is built around statutory frameworks like the Environment Act and Water Resource Management Plans. These rely on long-term forecasting to ensure resilience, yet the untracked and growing demand from data centres creates a blind spot that could destabilise carefully modelled supply-and-demand balances. Worse, this demand is often concentrated in regions already deemed "seriously water stressed," compounding risk.

Inclusion of digital infrastructure in water planning is essential not only for sustainability but for economic stability, as water scarcity is already halting housing developments and driving up costs across sectors.

Actions:

1. Revise the 2025 National Framework for Water Resources and Water Resource Management Plans (WRMPs) to explicitly include AI/data centre water demand.

2. Coordinate Defra, DSIT, Ofwat, and the Environment Agency to forecast digital water demand scenarios.
3. Require future infrastructure proposals to include long-term, validated water impact assessments.

Strategic Recommendation 3: Drive Adoption of Water-Efficient Technologies

Why this matters:

Most current data centres in the UK rely on evaporative cooling systems that consume potable water and lose up to 80% of it through evaporation. These practices create a direct competition with local drinking water supplies, especially during heatwaves and droughts. Yet viable alternatives already exist.

Technologies such as immersion cooling, direct-to-chip systems, and hybrid systems offer significantly reduced water usage and are increasingly mature. Closed-loop systems and the use of non-potable sources such as greywater or harvested rainwater can also offset environmental impacts. For example, Google uses reclaimed water at a quarter of its campuses, and Microsoft has developed zero-water cooling prototypes.

The barrier is not feasibility but cost and policy inertia. Without regulatory pressure or targeted financial support, data centre developers are unlikely to choose higher-cost sustainable systems. Accelerating the adoption of these technologies is vital to align digital growth with national environmental targets.

Actions:

1. Mandate use of high-efficiency cooling technologies if data centre will be near water stressed regions (e.g., immersion cooling, closed-loop systems).
2. Set national targets to eliminate the use of potable water for cooling
3. Provide grants or tax incentives to support adoption of non-potable and recycled water systems.

Strategic Recommendation 4: Prioritise Responsible Siting of AI Infrastructure

Why this matters:

Many of the UK's proposed or existing data centres including in designated AI Growth Zones are located in areas already facing severe water stress, such as Oxfordshire,

Cambridgeshire, and parts of East Anglia. These areas have been officially designated as “seriously water stressed” by the Environment Agency and face growing tensions between environmental, domestic, and commercial water uses.

Siting water-intensive infrastructure in these regions risks environmental degradation, biodiversity loss, and public opposition. Local communities are already voicing concerns over the pressure placed on water systems, and the risk of social unrest increases when essential resources appear to be diverted for corporate benefit.

The recent designation of data centres as Critical National Infrastructure increases the urgency. It offers these developments priority status in planning, potentially bypassing the normal checks and balances. This must be counterbalanced with stronger safeguards on siting and sustainability.

Actions:

1. Restrict new data centres in areas designated as “seriously water stressed.”
2. Require site-specific water risk assessments and approvals from local water authorities.
3. Make water infrastructure a core consideration in AI Growth Zone and Critical National Infrastructure planning.

Strategic Recommendation 5: Lead by Example through Government ICT Policy and Procurement

Why this matters:

The government is both a major operator of data infrastructure and one of the country’s largest procurers of digital services. Its policies and purchasing decisions shape market behaviour. Current Greening Government Commitments include carbon and cost targets but water is still treated as a secondary concern.

Public ICT contracts can create demand for high-efficiency, low-water infrastructure, pushing the market towards more sustainable practices. They can also promote AI-driven water management tools including pollution tracking, drought forecasting, and optimisation of water-energy systems helping to reduce the water footprint of both government and industry.

Leadership here is also a question of legitimacy. As public awareness of digital water use grows, government credibility will depend on its ability to demonstrate its own sustainable practice.

Actions:

1. Embed water efficiency targets in the next Government Digital Sustainability Strategy (2025-30).
2. Mandate water usage disclosure from cloud and data centre suppliers to the public sector.
3. Invest in AI for water management including pollution tracking, water quality modelling, and drought resilience.

Conclusion

Unchecked AI and data centre growth risks exacerbating the UK's existing water vulnerabilities. Transparent data, smarter planning, and targeted investment in sustainable infrastructure are essential to protect national water security.

By adopting the recommendations above, the UK government can ensure digital innovation does not come at the cost of environmental degradation and instead support a resilient, resource-efficient AI future.