

UK: Leading Efficient AI through Technology Transfers

Section 1: UK's AI Policies

Since 2023, the United Kingdom (UK) has taken an aggressive pro-innovation approach to AI with the objective of avoiding unnecessary barriers for the growth of AI. The UK government has a goal to become a top three nation in creating and scaling AI technology and to have the UK's first trillion-dollar technology business by 2035 (Department for Science, Innovation & Technology [DSIT], 2025). However, the government's stated desire to grow data center computing capacity by 20 times by 2030 is set to quadruple the UK's data center energy demand to 22 TWh (House of Commons Environmental Audit Committee [EAC], 2026). The key environmental issue at stake is that this level of unmitigated growth will force the energy sector to expand faster than the UK and other countries can build low carbon infrastructure. This directly opposes the UK's Net Zero targets and will greatly contribute to the greenhouse gas emissions if no guardrails are put in place (EAC, 2026).

Before the AI boom, the UK was progressive in their attempts to contribute fewer greenhouse gases to the atmosphere. In 2019, the UK amended the Climate Change Act 2008 and added a legally binding national Net Zero goal by 2050 (Climate Change Act 2008, 2019). The Labour Party included the aggressive Clean Power 2030 Action Plan, which sets the target of 95% of Great Britain's power to be generated by clean energy sources by 2030, in their 2024 manifesto (Labour Party, 2024). The UK also passed the Environment Act 2021

with the goal of being an example for one of the best environmental stewards on earth (Abrahams, 2021)

Nonetheless, the UK has adopted an aggressive growth first posture on AI (DSIT, 2025). The UK outlined this strategy in their white paper titled “A pro-innovation approach to AI regulation” (DSIT, 2023b). The UK has chosen to use a flexible “context-specific” risk-based regulatory framework that requires risk analyses focused on specific companies, programs and outcomes while avoiding determining risk for the entire industry (Briône & Day, 2023). As of early 2026, the UK has not passed legislation to regulate AI’s environmental impact (White & Case, 2025). In 2026 the government continues its "non-statutory approach" established in “A pro-innovation approach to AI regulation” (DSIT, 2023b).

Throughout these growth plans, the UK government does acknowledge the impact of AI on the environment. The Department for Science, Innovation & Technology’s (DSIT) “AI Opportunities Action Plan” from 2025 outlines the best ways for the UK to fully “capture the opportunities of AI to enhance growth” (DSIT, 2025). Though, action 5 of this report does instruct the government to reduce the sustainability risks of AI infrastructure, not by slowing growth, but by positioning the UK as the world leader for green infrastructure solutions (DSIT, 2025). In another instance, principle 2, in the 2024 report on the use of AI for HM Government, requires the use of the “smallest effective model” of AI (Central Digital and Data Office [CDDO], 2024).

A cornerstone of the UK’s AI strategy is their “National semiconductor strategy.” In it, the DSIT outlined the need for the UK to become a critical part of the semiconductor supply

chain. However, the UK was years behind Asian chip manufacturers. Instead, the UK would focus on its strengths in research and development (R&D), chip design IP, and compound semiconductors, with plans to invest £1 billion in semiconductor technology from 2023 through 2033 (DSIT, 2023a). These investments have already spurred significant advancements in chip technology. UK researchers have created a new atomically thin chip design with the potential to reduce energy consumption by 90% (Queen Mary University of London, 2025). Since the goal is to become a knowledge center, the UK has already entered a technology transfer partnership with the E called the Chips Joint Undertaking Programme (Chips JU) (Chips Joint Undertaking [Chips], 2024).

Within the government, there are two large opposing stakeholders in the issue of AI. These include the DSIT, whose mandate is to focus on aggressive growth powered through AI and establishing AI Growth Zones, and the Department for Energy Security and Net Zero (DESNZ), whose mandate includes the Clean Power 2030 plan which calls for the UK to fully decarbonize by 2030 (UK Government, 2026; EAC, 2026). However, the UK government established The AI Energy Council as an effort to encourage collaboration between the AI and energy sectors and to bridge the gap between the two mandates (AI Energy Council, 2026).

Other major stakeholders outside of the government consist of the technology industry running AI products and their customers, data center companies, those researching AI and computing infrastructure and the citizens who experience the negative externalities of high energy and water usage directly or indirectly through climate change. Technology companies are broadly represented in policy making by trade associations in the UK

including techUK, and the Startup Coalition and Federation of Small Businesses. The most immediately impacted citizens in the UK by AI's energy and water usage are those in AI hubs like Greater London, Manchester, and South Wales (EAC, 2026).

Opposition to these pro-innovation policies mainly lies on the left politically. In their 2024 manifesto, the opposition Labour Party committed to passing regulations limiting AI companies, in direct contrast to the Conservative government's pro-innovation stance (Manancourt, 2024). However, once in power the Labour party reversed course. When speaking on the risks of AI, in an interview with The Economist, Prime Minister Starmer explained that you can overanalyze the risks of AI, or you can "lean in" to its potential. He has decided to "lean in," framing the decision as important to not fall behind in the global economy (The Economist, 2025).

Section 2: Policy Proposal

The UK must be the world leader in establishing the first multilateral data center efficacy standard. Under this agreement each signatory country would require all AI queries originating within their borders to be processed only by data centers meeting a minimum Power Usage Effectiveness (PUE) and a Water Usage Effectiveness (WUE) standard. A minimum level of efficiency will allow the UK to continue its AI-driven growth while also expanding the demand for advanced chip R&D from the UK. This policy will also create a level market, preventing countries from fueling extreme growth while polluting the world. As a part of this agreement, the UK will expand their chip technology transfer program

beyond the Chips JU, to include all signatory countries, lowering global energy demand while advancing their semiconductor strategy (Chips, 2024).

Between the recent breakthrough from government-sponsored chip research, the UK's technology transfer program, and the UK being the third largest AI consumer in the world, the UK is in a prime position to demand higher efficacy standards and to supply the solutions (DSIT, 2025). Multilateral agreements for fuel efficacy standards have already been a proven mechanism to successfully reduce emissions from vehicles; this can be a familiar mechanism used to encourage engagement from other countries. The UK holds an extensive amount of power and must lead the way to lowering AI's impact.

The proposed policy will create efficacy milestones for every data center providing computing power to signatory countries, with aggressive but realistic targets. PUE and WUE are the internationally recognized standard for data center energy and water efficiency (International Organization for Standardization & International Electrotechnical Commission [ISO/IEC] 30134-2, 2026; ISO/IEC 30134-9, 2022). The efficacy standards will be set by experts based on what will be needed to limit environmental effects, and what is technically feasible. Having minimum efficacy requirements creates a market that eliminates the need to use cheaper but less efficient inputs but will raise the cost of AI. To remain competitive, it will be crucial for the UK to get major AI consuming countries to agree to this standard. Creating a minimum efficacy standard sets a guardrail for each country not to be able to undercut each other. The more immediate issue for most countries is to keep up with AI growth. Many countries are heavily discounting the future

impacts of this carbon and water intensive growth. There must be strict standards implemented to prevent unmitigated growth.

A multilateral efficacy standard will be easiest to achieve through the United Nations Economic Commission for Europe (UNECE) Global Technical Regulations (GTRs). This is a familiar framework in which countries, including those beyond Europe, work together to develop and implement technological standards for many sectors including vehicle emissions (United Nations Economic Commission for Europe [UNECE], 2026). Proposing these standards through a UN allows the UK to target desirable partners like China and EU countries. This type of agreement does not have an enforcement mechanism built in but does rely on each country to create an internal enforcement mechanism. Crucially, the UK must prioritize making its chip technology readily available for partner countries, enabling countries to achieve these goals and giving a large incentive beyond using less power. Global electricity capacity is currently strained. Employing the UK's chip technology lowers the power needed per query, while lowering AI's carbon and water footprints. As part of this agreement the UK must agree to technology sharing, granting signatory countries access to their chip technology. The funding to create and maintain these efficacy standards will come from UNECE, following the same funding structure used for other UNECE standards. The funding for building and maintaining compliant data centers will come from the already large investments the target countries are already making into AI. Global data center investment exceeded \$270 billion in 2025 and is expected to top \$1 trillion by 2030 (IoT Analytics, 2025; UN Trade and Development, 2026).

The UK should start by targeting the countries in the EU with the largest compute power: Germany, France, and the Netherlands. The EU is a natural first place to look for partners. The EU has already mandated that larger data centers report their PUE, WUE, and renewable energy use, with the goal to regulate this in the future (European Parliament, 2023). The UK and the EU also already share similar car efficacy standards and are a natural fit for coming together. Working together with the EU to create efficacy standards that are realistic and based on the chip R&D happening in the UK, will allow the UK to prevent others from implementing harsh or quick standards that are too burdensome. The UK will have a great advantage if they lead this initiative. This will allow them to hold their place as a standard setter, instead of being the standard taker.

If the UK can get EU countries to sign on to the one efficacy standard, this will create the second largest economic bloc in the world by GDP (International Monetary Fund [IMF], 2025). This provides significant leverage to bring the world's leaders in data center technology, to sign on to these efficacy standards.

While the UK prefers that most of its data flow through NATO countries, securing an agreement with the US will be a diplomatic challenge, given the current administration's transactional foreign policy and its preference for carbon-intensive energy (Manancourt, 2024; EAC, 2026). The UK and EU bloc should focus on working with Japan and Korea. These countries already have policies aimed at making data centers cheaper to run, or more energy efficient (International Energy Agency, 2025). They also have close diplomatic ties with the UK. Once all these countries have signed on, The UK should target China as a signatory. China's data center electricity is generated by about 70% coal powered

electricity. Bringing China onboard with efficiency standards and technology transfers could offer the largest emissions reduction (International Energy Agency, 2025). China has a large initiative to reduce their emissions. They accounted for 40% of the world's renewable energy expansion (International Energy Agency, 2023). Bringing China onboard with this standard may be required to create enough supply of highly efficient compute power to keep the cost of using AI low enough to encourage the growth the UK is striving for. Without a common minimum efficacy standard, there will be no incentive for AI companies and data centers to lower their energy and water usage. However, the UK cannot afford to act unilaterally. Their semiconductor strategy already shows they are creating a path to contribute to better global efficiency. Leading a multilateral agreement in efficacy standards is consistent with the UK's own goals, and allows them to be the standard setter, reducing the risk of being regulated by others. If no agreement is reached, the race to the cheapest and often more carbon intensive energy wins, making the UK's Net Zero commitments meaningless and reducing demand for their chip technology.

References

- Abrahams, D. (2021, December 2). *The UK's Environment Act 2021: A vehicle to "deliver the most ambitious environmental programme of any country on earth"*. Steptoe LLP.
<https://www.steptoe.com/en/news-publications/the-uks-environment-act-2021-a-vehicle-to-deliver-the-most-ambitious-environmental-programme-of-any-country-on-earth.html>
- AI Energy Council. (2026). *AI Energy Council*. GOV.UK. Retrieved May 3, 2026, from
<https://www.gov.uk/government/groups/ai-energy-council>
- Brîône, P., & Day, S. (2023, August 11). *Artificial intelligence and employment law* (Research Briefing CBP-9817). House of Commons Library.
<https://researchbriefings.files.parliament.uk/documents/CBP-9817/CBP-9817.pdf>
- Central Digital and Data Office. (2024, January). *Generative AI framework for HM Government* (V1.0). <https://www.gov.uk/government/publications/generative-ai-framework-for-hmg>
- Chips Joint Undertaking. (2024, March 13). *UK joins the Chips JU programme, strengthening tech ties with the EU* [Press release]. <https://www.chips-ju.europa.eu/News-detail/?id=d3e09509-42e1-ee11-904c-000d3a662199>
- Climate Change Act 2008, c. 27 (UK), as amended by Climate Change Act 2008 (2050 Target Amendment) Order 2019, SI 2019/1056.
<https://www.legislation.gov.uk/ukpga/2008/27/contents>
- Department for Science, Innovation & Technology. (2023a, May 19). *National semiconductor strategy*. <https://www.gov.uk/government/publications/national-semiconductor-strategy/national-semiconductor-strategy>

- Department for Science, Innovation & Technology. (2023b, March). *A pro-innovation approach to AI regulation* (CP 815). <https://www.gov.uk/government/publications/ai-regulation-a-pro-innovation-approach>
- Department for Science, Innovation & Technology. (2025, January 13). *AI opportunities action plan*. <https://www.gov.uk/government/publications/ai-opportunities-action-plan>
- European Parliament. (2023, September 13). *Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency*. <https://eur-lex.europa.eu/eli/dir/2023/1791/oj>
- House of Commons Environmental Audit Committee. (2026). *Risks and opportunities to the sustainability of data centres in the UK* [Inquiry]. UK Parliament. Retrieved May 2, 2026, from <https://committees.parliament.uk/work/9651/risks-and-opportunities-to-the-sustainability-of-data-centres-in-the-uk/>
- International Energy Agency. (2023). *China*. Retrieved May 1, 2026, from <https://www.iea.org/countries/china>
- International Energy Agency. (2025). *Energy and AI* (World Energy Outlook special report). <https://www.iea.org/reports/energy-and-ai>
- International Monetary Fund. (2025). *World economic outlook: Global economy in flux, prospects remain dim* (October 2025). <https://www.imf.org/en/Publications/WEO/Issues/2025/10/>
- International Organization for Standardization & International Electrotechnical Commission. (2022). *Information technology — Data centres key performance indicators — Part 9: Water usage effectiveness (WUE)* (ISO/IEC Standard No. 30134-9). <https://www.iso.org/standard/77692.html>

International Organization for Standardization & International Electrotechnical Commission.

(2026). *Information technology — Data centres key performance indicators — Part 2:*

Power usage effectiveness (PUE) (ISO/IEC Standard No. 30134-2).

<https://www.iso.org/standard/30134-2>

IoT Analytics. (2025, November). *Data center equipment & infrastructure market report 2025–*

2030. <https://iot-analytics.com/data-center-infrastructure-market/>

Labour Party. (2024). *Change: Labour Party manifesto 2024*. <https://labour.org.uk/change/>

Manancourt, V. (2024, October 21). How Labour fell out of love with the AI bill. *Politico*.

<https://www.politico.eu/article/how-labour-fell-out-love-with-ai-bill-peter-kyle/>

Queen Mary University of London. (2025, April 29). *Atom-thin semiconductors could cut energy*

use by over 90%. [https://www.qmul.ac.uk/media/news/2025/science-and-](https://www.qmul.ac.uk/media/news/2025/science-and-engineering/se/atom-thin-semiconductors-could-cut-energy-use-by-over-90.html)

[engineering/se/atom-thin-semiconductors-could-cut-energy-use-by-over-90.html](https://www.qmul.ac.uk/media/news/2025/science-and-engineering/se/atom-thin-semiconductors-could-cut-energy-use-by-over-90.html)

The Economist. (2025, December 4). Transcript: An interview with Keir Starmer. *The*

Economist. [https://www.economist.com/britain/2025/12/04/transcript-an-interview-with-](https://www.economist.com/britain/2025/12/04/transcript-an-interview-with-keir-starmer)

[keir-starmer](https://www.economist.com/britain/2025/12/04/transcript-an-interview-with-keir-starmer)

UK Government. (2026b). *Digital and technologies*. business.gov.uk. Retrieved May 2, 2026,

from <https://www.business.gov.uk/invest-in-uk/investment/sectors/technology/>

United Nations Economic Commission for Europe. (2026). *Vehicle regulations*. Retrieved May

2, 2026, from <https://unece.org/transport/vehicle-regulations>

United Nations Trade and Development. (2026, January 20). *Data centres are reshaping the*

global investment landscape. [https://unctad.org/news/data-centres-are-reshaping-global-](https://unctad.org/news/data-centres-are-reshaping-global-investment-landscape)

[investment-landscape](https://unctad.org/news/data-centres-are-reshaping-global-investment-landscape)

White & Case LLP. (2025, November 25). *AI Watch: Global regulatory tracker — United Kingdom*. Retrieved May 1, 2026, from <https://www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker-united-kingdom>