Competition for AI Energy Capacity

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Monopsony and monopoly power could distort energy access. Competition authorities should safeguard competition and consumer welfare by securing access, supporting capacity expansion, and fostering competitive energy markets.

Introduction

Artificial Intelligence (AI) is intensifying competition for access to energy resources. As AI models become more complex and widely deployed, demand for the data centers that power them is surging. These centers provide the computing power, data storage, servers, and network infrastructure needed for AI developers to develop and deploy models at scale. The consultancy McKinsey estimates that global demand for data center capacity will grow 19–22% annually from 2023 to 2030, reaching 171–219 gigawatts (GW) of power consumption[1]. This boom is driving competition to secure access to energy inputs, especially electricity to power AI infrastructure and water to cool it.

Yet the intensifying demand for energy is already straining supply, making AI energy capacity a growing competitive concern. In France, the French Competition Authority has already announced a study into energy access for AI actors[2]. While the competition community has so far given limited attention to this issue, the present analysis, focused on electricity access, offers preliminary insights into market dynamics and potential competition risks. It concludes with recommendations to competition authorities for securing energy access, supporting energy capacity expansion, and fostering competitive energy markets. A more comprehensive study would help policymakers, competition authorities, and market participants gain a deeper understanding of these dynamics and design tailored policy solutions to ensure a competitive market for AI energy capacity.

[1] AI power: Expanding Data Center Capacity to Meet Growing Demand, *Mckinsey & Company*, 29 October 2024 (accessed 14 August 2025). Available at: https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand

[2] Autorité de la concurrence, Roadmap 2025-2026, 10 July 2025 (accessed 15 August 2025). Available at: https://www.autoritedelaconcurrence.fr/sites/default/files/2025-07/ADLC%20feuille%20de%20route%202025-26-EN.pdf

Market Dynamics

AI model developers begin by training and fine-tuning their models on vast amounts of high-quality data. This training phase, which is conducted only once or periodically, requires immense computing power and energy, resulting in a significant increase in data center energy demand. As models become more data-intensive and complex, both computational requirements and electricity consumption have surged[3].

After training, energy needs remain high during the inference phase, when users use models to generate outputs. Although inference consumes less power than training, it happens continuously. Morgan Stanley estimates that inference will account for 75% of U.S. data center energy and computing demand in the coming years[4].

To curb energy use, AI developers are adopting more efficient solutions. Techniques like Low-Rank-Adaptation (LoRA) enable fine-tuning with reduced computational power. The development of smaller AI models also consumes fewer resources than larger ones[5]. On-device models reduce reliance on data centers by running inference directly on user devices.

Data centers, in turn, are becoming more efficient. Liquid cooling systems directly absorb and remove heat from chips, with AI tools adjusting temperatures in real-time to optimise efficiency[6]. Hardware is also advancing to reduce energy costs. Chip manufacturer Groq, for example, is designing chips that are up to ten times more efficient than existing systems[7].

Still, reliable access to energy remains essential to support AI models. To secure supply from energy grids, data center providers are increasingly turning to long-term power purchase agreements (PPAs) and direct investments in renewable energy sources. Meta, for instance,

[3] Inside the relentless race for AI capacity, *Financial Times*, 31 July 2025 (accessed 18 July 2025). Available at: https://ig.ft.com/ai-data-centres/

[4] Tim Bradshaw, How 'Inference' is Driving Competition to Nvidia's AI Chip Dominance, *Financial Times*, 11 March 2025 (accessed 15 August 2025). Available at: https://www.ft.com/content/d5c638ad-8d34-4884-a08c-a551588a9a28

[5] Christophe Carugati, Competition in Generative Artificial Intelligence Foundation Models, *Bruegel*, 18 July 2023 (accessed 15 August 2025). Available at: https://www.bruegel.org/working-paper/competition-generative-artificial-intelligence-foundation-models

[6] How More Efficient Data Centres Could Unlock The AI Boom, *Financial Times*, 7 August 2025 (accessed 15 August 2025). Available at: https://www.ft.com/content/cb970062-5311-477b-8e43-93b67c2fd79c?utm

[7] Groq (accessed 18 August 2025). Available at: https://groq.com/products

has bought the entire output of a Texas solar project from RWE[8]. It has also invested in geothermal with Sage Geosystems[9] and nuclear with Constellation Energy in the U.S[10]. Yet, connecting to the grid remains slow, often delayed by a backlog of interconnection requests[11].

As a workaround, data center providers are investing in off-grid energy solutions by building on-site power plants to supply their data centers directly. OpenAI's Stargate project, which aims to build its AI infrastructure, includes a natural gas facility[12]. Yet, such projects face hurdles, ranging from land acquisition and permits to lengthy construction timelines. Others opt to rent generators from energy providers, using co-location loads that bypass the grid. For instance, Amazon explored this approach for a data center, but the U.S. Federal Energy Regulatory Commission rejected the project on procedural grounds[13].

Potential Competition Concerns

Theoretical competition concerns could arise from both monopsony power held by dominant energy buyers and monopoly power held by dominant energy providers.

Regarding monopsony power, a dominant energy buyer in a given geographic market could secure all or most of an energy producer's output under long-term contracts, or negotiate preferential tariffs and priority energy access. Such practices risk harming rival data centers and consumers. If alternative energy sources are unavailable, rivals may be delayed, face higher prices, or be prevented from accessing the electricity needed to operate, effectively excluding them from the market. Consumers in the same area could also face higher prices or outages due to supply shortages. In some cases, providers have resorted to less sustainable

[8] Vera Bücker, RWE and Meta Sign Long-Term Power Purchase Agreement for Offtake from 200-Megawatt Energy Project In Texas, *RWE*, 18 March 2025 (accessed 14 October 2025). Available at: https://www.rwe.com/en/press/rwe-clean-energy/2025-03-18-rwe-signs-long-term-ppa-with-meta/

[9] New Geothermal Energy Project to Support Our Data Centers, *Meta Blog*, 26 August 2026 (accessed 15 August 2025). Available at: https://about.fb.com/news/2024/08/new-geothermal-energy-project-to-support-our-data-centers/

[10] Meta and Constellation Partner on Clean Energy Project, *Meta Blog*, 3 June 2025 (accessed 15 August 2025). Available at: https://about.fb.com/news/2025/06/meta-constellation-partner-clean-energy-project/

[11] Can the US Power Grid Keep Up with the AI Data Centre Boom?, *Financial Times*, 19 June 2025 (accessed 15 August 2025). Available at: https://www.ft.com/content/028ac906-1898-436a-907c-45eb7875e1ee

[12] *Ibid*.

[13] Robert A. James, FERC Rejects Interconnection Proposal for Nuclear-Powered Data Center Project, *Pillsbury Law*, 13 November 2024 (accessed 25 August 2025). Available at: https://www.pillsburylaw.com/en/news-and-insights/ferc-interconnection-nuclear-data-center.html

sources to fill the gap. For example, in Memphis, xAI requested 150 megawatts but received only 50 from the grid, supplementing the shortfall with 35 methane gas turbines, which have raised environmental and public health concerns that ultimately harmed consumers[14].

When investing in energy sources, a dominant buyer could partner with an energy provider on exclusive, quasi-exclusive, or preferential terms, thereby securing privileged access to energy production and further restricting rivals' ability to compete. Such arrangements may also involve the buyer acquiring equity stakes in the provider, giving them influence over how energy is allocated to competitors.

Similarly, in off-grid contexts, the buyer could acquire most of the land suitable for power plant development or lease all or a significant portion of available generators for co-located loads, foreclosing rivals from building or renting their own on-site energy solutions.

Regarding monopoly power, a dominant energy provider could grant preferential or discriminatory access, excluding certain buyers from the market. It could also offer preferential tariffs to select buyers, allowing them to operate with lower computing costs and gain a competitive advantage over rivals. In unregulated markets, providers may raise prices for businesses and consumers in response to surging demand for AI, thereby harming consumer welfare.

Preliminary Policy Actions

Energy access is a priority for data center providers, as electricity is the essential input for their operations. Yet, energy remains a scarce resource, and expanding supply to meet the surge in AI-driven demand requires significant time and investment from both data center operators and energy providers.

In this context, competition authorities, working closely with energy and environmental regulators, play a crucial role in ensuring that rising energy needs are met in a manner that safeguards competition and consumer welfare.

[14] Andrew R. Chow, 'We Are the Last of the Forgotten:' Inside the Memphis Community Battling Elon Musk's xAI, *Times*, 13 August 2025 (accessed 15 August 2025). Available at: https://time.com/7308925/elon-musk-memphis-ai-data-center/?utm

First, they should ensure energy access. Monopsony power or monopoly power could foreclose access through preferential access and tariffs to electricity. Competition authorities should closely scrutinise the market to monitor potential competition concerns. In particular, they should pay attention to partnerships between data center providers and energy providers, as these could raise concerns when they involve exclusive, quasi-exclusive, or preferential access terms and tariffs on a long-term basis, such as long-term PPAs that acquire the entire energy output.

Second, they should support energy capacity expansion. Given financial, legal, and timing constraints, authorities could facilitate new energy projects through joint ventures, long-term agreements, or co-location arrangements, especially when these initiatives advance sustainability goals such as expanding renewable energy.

Finally, they should promote competitive energy markets. Data center participation in wholesale energy markets could help increase energy supply and grid access, thereby stabilising prices for consumers. At the same time, authorities should monitor whether AI-driven demand causes unjustified price hikes or grid strain. If so, they may need to explore interventions on pricing or grid access rules.

About

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