BTUAI · Analytical Report

Artificial Intelligence and Electricity

01 How Much Electricity Artificial Intelligence Uses Today

Artificial intelligence (AI) runs in data centres, so its electricity use is measured through the consumption of those centres. According to the International Energy Agency (IEA), the world's data centres used 415 terawatt-hours (415 billion kilowatt-hours) of electricity in 2024, about 1.5 percent of global electricity consumption. In 2025 this figure grew by 17 percent and reached 485 terawatt-hours. The consumption of AI-focused centres grew by 50 percent in a single year and now makes up about a third of the total.

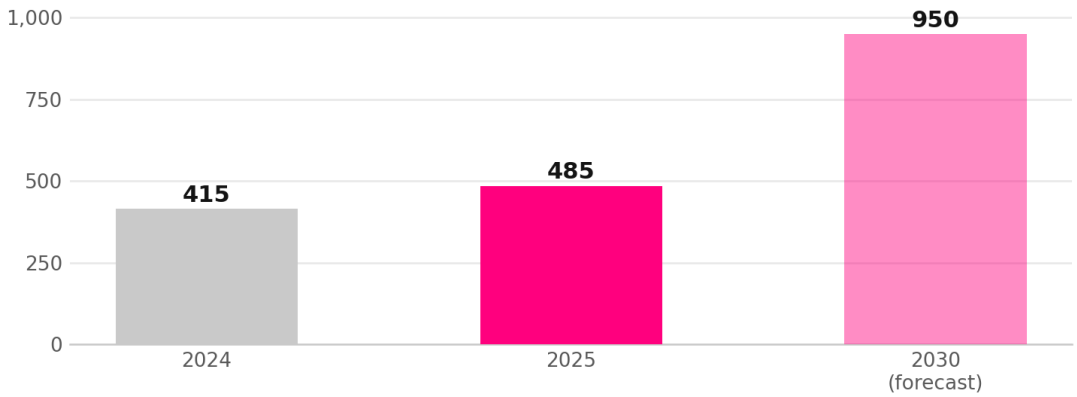


Chart 1. Electricity consumption of the world's data centres, terawatt-hours. Source: IEA.

A single question requires little energy. According to Google, one Gemini text prompt uses 0.24 watt-hours on average, and according to OpenAI's chief executive, one ChatGPT query uses about 0.34 watt-hours. These are the companies' own figures and have not been independently verified. Total consumption is large because the number of questions is enormous, and complex tasks require far more energy: according to independent measurements, "reasoning" mode uses on average 30 times more energy on the same model.

Efficiency gains do not reduce total consumption. Google reports that the energy needed to process one prompt fell 33-fold in a year, yet in 2025 the company's electricity consumption rose by 37 percent.

Consumption is not evenly distributed between countries. In Ireland, data centres accounted for 23 percent of national electricity consumption in 2025, while the global average is about 1.5 percent.

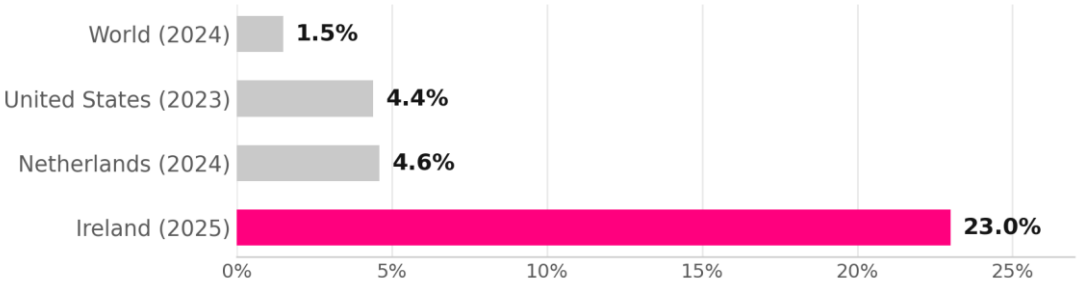


Chart 2. Data centres' share of electricity consumption. Sources: IEA, US Department of Energy, CBS, CSO.

02 How Much It Will Use in the Coming Years

Under the IEA's base scenario, data centre consumption will roughly double to about 950 terawatt-hours by 2030, reaching about 3 percent of global electricity consumption. Consumption by AI-focused centres will triple over this period. The research firm Gartner gives higher figures: 565 terawatt-hours as early as 2026 and more than 1,200 terawatt-hours in 2030.

Forecasts differ considerably. According to the US Lawrence Berkeley National Laboratory, American data centres will use between 6.7 and 12 percent of the electricity consumed in the country in 2028, compared with 4.4 percent in 2023. At the same time, expectations may be exaggerated. According to an analysis by Grid Strategies, US utilities' forecasts of data centre load exceed by about 40 percent the volume that chip supply can support, because developers submit the same project to several companies.

03 What This Means for Electricity Generation and Prices

New demand requires new generation. The IEA estimates that up to 2030 about half of the additional demand from data centres will be met by renewable energy and about 40 percent by gas and coal. Technology companies' nuclear power agreements deliver less than they appear to: according to a 2026 analysis by the Carnegie Endowment, most of the roughly 13 gigawatts of capacity commitments concern existing plants, and this volume would cover less than 20 percent of the expected demand of US data centres.

The effect on prices is clearest in the largest US electricity market, PJM. The total cost of the July 2026 capacity auction was 16.4 billion dollars, and for the first time in PJM's history the whole region fell 6,831 megawatts short of meeting its reliability requirement. The independent market monitor estimates that about 40 percent of the cost in recent auctions is linked to data centres. PJM calculated that the result of one earlier auction would raise some customers' bills by 1.5 to 5 percent.

At the national level the effect is still small. A 2026 study by Lawrence Berkeley National Laboratory and Brattle found that the real retail price of electricity in the US in 2025 was 3 percent higher than in 2019. The authors note that this may change if demand grows quickly. This is why rules are already changing:

in Ohio, large consumers must pay for at least 85 percent of the capacity they order for up to 12 years, and Ireland requires new large centres to have their own generation.

04 What This Means for Georgia

Georgia has no surplus electricity. According to the Electricity Market Operator (ESCO), in 2025 the country generated 13.8 billion kilowatt-hours and consumed 14.9 billion. Hydropower plants account for 79 percent of generation and thermal plants for 20 percent. Imports amounted to 1.56 billion kilowatt-hours and exports to 0.51 billion, so net imports were about 1.05 billion. Exports are mostly possible in spring and summer, while in winter the country runs a deficit.

A data centre runs without interruption all year round. By our calculation, a single 100-megawatt centre would use about 0.88 billion kilowatt-hours a year. That is about 6 percent of national consumption and almost equal to the net imports of 2025. Without new generation, such a load would deepen the winter deficit and require additional imports or thermal generation.

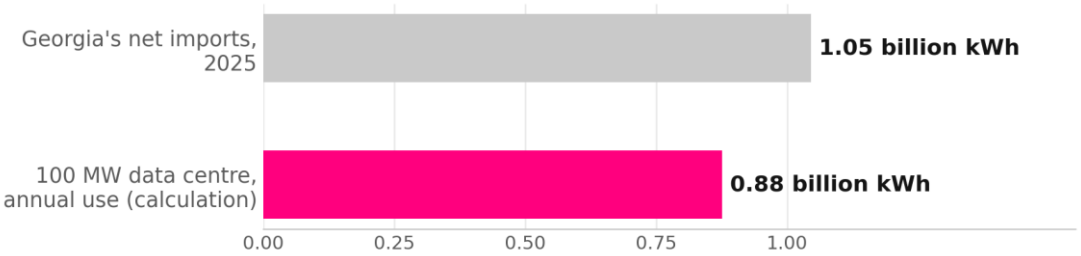


Chart 3. Georgia's net electricity imports in 2025 and the annual consumption of a 100-megawatt data centre. Sources: ESCO, authors' calculation.

Prices are already rising. From 1 April 2026, the regulator (GNERC) raised the household tariff by 5 tetri per kilowatt-hour, or 27.2 percent, and the business tariff by about 20 percent. Investment in the network and the higher cost of purchasing electricity were named as the reasons.

Georgia already has similar experience with cryptocurrency mining. By 2018, large consumers, mostly miners, used about 10 percent of the country's electricity. In 2019–2021, against the background of rising tariffs and dependence on imports, Georgia's share of global mining fell from 0.32 percent to 0.10 percent. Cheap electricity attracts load, and a tariff increase sends it to another country.

AI infrastructure is already being built in the region. In November 2025 the US approved the export of Nvidia chips to Armenia for a 100-megawatt project, and Kazakhstan plans a 125-megawatt centre by 2027. Georgia has no comparable project yet. Under current plans, the country's installed capacity should grow from 4,800 to 11,600 megawatts by 2036, but the large hydropower projects (Nenskra, Khudoni, Namakhvani) are delayed.

05 Conclusions

Data centres today use about 1.5 percent of the electricity consumed worldwide, and AI is the fastest-growing part of this consumption. By 2030 this share is expected to double to about 3 percent, although forecasts differ considerably.

A single question is getting cheaper, while total consumption is growing. The effect on prices is local: it appears where centres are concentrated and new generation cannot keep up with demand. Who pays this cost depends on the rules.

Georgia is a net importer of electricity and runs a deficit in winter. Without new generation, a single large data centre would increase imports and the pressure on prices. Such a project makes sense only if new capacity is built and separate terms are set for large consumers.

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This analysis was prepared by the academic team of the Business and Technology University (BTU) together with BTUAI.

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