# AI’s soaring energy appetite threatens US power grid and environment



Artificial intelligence (AI) is rapidly becoming ubiquitous, yet its surging energy demands pose significant environmental concerns. A recent study by MIT Technology Review starkly illustrates just how much energy is consumed by AI models, particularly when generating video and other complex outputs. For instance, producing a mere five seconds of AI-generated video can require as much energy as running a microwave for over an hour, equating this to 3.4 million joules.

This escalated energy consumption is not merely a minor inconvenience; data from the Harvard T.H. Chan School of Public Health and UCLA indicates that carbon emissions from data centres have tripled since 2018, now accounting for approximately 2.18% of national emissions in the U.S. The findings demonstrate that as AI technologies advance—particularly multimodal models which create images and video—the demands for processing power and energy continue to surge.

This trajectory raises alarm bells among researchers and environmental advocates. The growth of data centres has accelerated, with predictions suggesting an increase in their share of the U.S. electricity grid usage will rise to 12% by 2030, effectively tripling their current consumption. The Electric Power Research Institute also forecasts that data centres will potentially consume as much as 9% of the nation’s total electricity, a more than twofold increase from current levels. Such demands could lead to strain on the electrical grid, with repercussions including higher energy costs and potential outages.

The tech industry has started making moves towards cleaner energy solutions, with companies like Microsoft exploring partnerships with nuclear power plants. However, this is not sufficient in the face of the ongoing crisis. The issue is exacerbated by a lack of transparency regarding energy consumption among large tech companies, making it difficult for consumers and policymakers alike to assess the true environmental impacts of these technologies. Efforts like the AI Energy Score project aim to standardise efficiency assessments but have yet to be widely adopted.

Some commentators argue that the perceived benefits of AI come at a hefty cost, where individual usage — whether for professional or recreational purposes — seems negligible amid a vast ecosystem of consumption. Yet, there is a growing recognition that the cumulative impact is significant, especially when one considers that some of the largest data centres reportedly use millions of gallons of water daily to maintain their operations.

Given the trajectory of AI adoption and energy consumption, it is imperative that discussions about its environmental impact become as commonplace as conversations around energy use in other sectors, such as transportation or agriculture. Notably, while there are ongoing debates about the sustainability of various products, from almond milk to electric vehicles, the vast energy required for AI content generation has largely escaped scrutiny.

As tools like ChatGPT, Gemini, and Claude become more integrated into our daily lives, the strain on energy infrastructure is only expected to grow. Should the expansion of AI technologies proceed without careful planning and sustainable practices, we risk facing an untenable future, one where our digital innovations come at an unacceptable environmental price.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.techradar.com/computing/artificial-intelligence/youll-be-as-annoyed-as-me-when-you-learn-how-much-energy-a-few-seconds-of-ai-video-costs> - Please view link - unable to able to access data
2. <https://www.technologyreview.com/2024/12/13/1108719/ais-emissions-are-about-to-skyrocket-even-further/> - A recent study from the Harvard T.H. Chan School of Public Health and UCLA Fielding School of Public Health examined 2,132 data centers in the U.S., revealing that since 2018, carbon emissions from these centers have tripled, now accounting for 2.18% of national emissions. The surge is attributed to the rapid expansion of AI models, particularly multimodal ones capable of generating images and videos, which significantly increase data processing demands and energy consumption. The study emphasizes the urgent need for sustainable practices to mitigate the environmental impact of AI's growth.
3. <https://www.reuters.com/breakingviews/ai-power-demand-is-generating-hallucinations-2025-05-20/> - The escalating power requirements of artificial intelligence (AI) are driving an expansion of data centers and the energy infrastructure that supports them, leading to potentially exaggerated projections of future energy demand. Tech giants like Microsoft, Amazon, and Google are investing over $300 billion in capital expenditure in 2025, with data centers expected to triple their share of U.S. grid usage to 12% by 2030. However, discrepancies between canceled projects and persistent equipment shortages suggest overstated demand. Utilities and tech firms have incentives to overestimate, contributing to a distorted picture. Companies like GE Vernova and Hitachi Energy face backlogs as utilities plan for massive potential loads, with projections sometimes double actual consumption estimates. Microsoft’s temporary pause in infrastructure raised concerns, yet Azure growth remained strong. Overexpansion risks include excessive spending, inflated energy forecasts, and rising construction and equipment costs. Alternative solutions include better grid management and shared cost burdens. Misreading these signals can mislead investors and affect policy and infrastructure planning. The landscape remains volatile despite continued AI growth.
4. <https://www.ft.com/content/ea513c7b-9808-47c3-8396-1a542bfc6d4f> - The article discusses the rising energy consumption of artificial intelligence (AI) models and the associated environmental impact. While data centers supporting AI are estimated to produce emissions comparable to the aviation industry (around 3% of global emissions), the energy usage varies widely across models. Lightweight models like TinyBERT and DistilBERT are highly efficient, using only 0.06 watt-hours per 1,000 queries, while large language models (LLMs) like GPT-4 or Claude consume significantly more energy for similar tasks due to their complex, generative nature. A lack of transparency from major tech companies like Google and Anthropic exacerbates the issue, making energy consumption difficult to measure accurately. The AI Energy Score project, a collaborative open-source initiative, seeks to standardize efficiency assessments and raise awareness by comparing AI energy use with everyday activities. Despite some industry efforts toward cleaner energy, including investments in nuclear power and renewable energy, no major firms have adopted the AI Energy Score methodology. The author emphasizes the need for regulatory mandates to ensure energy transparency and urges the adoption of smaller, task-specific models to reduce environmental impact as AI becomes increasingly integral to daily life.
5. <https://www.reuters.com/business/energy/data-centers-could-use-9-us-electricity-by-2030-research-institute-says-2024-05-29/> - By 2030, data centers in the US might consume up to 9% of the nation's total electricity, more than twice their current usage, driven by investments in technology and computing hub expansions. According to the Electric Power Research Institute, which conducted the analysis, the growth rate in electricity consumption by data centers could range from 3.7% to 15% annually, depending on the adoption and energy efficiency of technologies like generative AI. The increasing demand for power by data centers, along with the expansion of manufacturing and transportation electrification, is revitalizing the US electricity industry after decades of stagnant growth. Large data centers require significant power, comparable to that needed for 750,000 homes. This rise in electricity demand could strain the grid, leading to higher power bills and potential outages. The institute highlighted the rapid growth of the data center business, notably post-2022 with OpenAI's ChatGPT, stressing the need for improved energy efficiency and grid investments. In 2023, about 80% of the US data center load was concentrated in 15 states, primarily Virginia and Texas.
6. <https://www.axios.com/newsletters/axios-generate-4c9f3850-1552-11f0-8393-f7beb65ab50c> - This Axios newsletter offers a comprehensive update on current energy, climate, and AI developments. A key focus is on a new International Energy Agency (IEA) report that argues concerns about AI-driven climate impact may be overstated. While AI data centers are projected to consume increasing amounts of electricity—potentially surpassing Japan’s current demand by 2030—the report finds existing AI technologies could cut emissions by about 5% in 2035. However, significant uncertainty remains about future energy use and emissions. The newsletter also explores how U.S. data centers are spreading beyond major coastal hubs, driving significant electricity demand. Meanwhile, the U.S. Global Change Research Program, responsible for the National Climate Assessment, faces potentially severe cutbacks by Trump officials, notably the cancellation of a key NASA support contract. Further updates include fluctuating oil prices amid ongoing U.S.-China trade tensions, President Trump’s push against state climate laws, and new bipartisan legislation to harness AI for extreme weather forecasting. The edition concludes with Gallup data showing a dip in Americans’ willingness to consider electric vehicles—48% in 2024, down from 55% in 2023—though interest still exceeds current EV market share.
7. <https://time.com/6987773/ai-data-centers-energy-usage-climate-change/> - The use of AI is causing a dramatic increase in energy consumption due to the need for extensive computing power in data centers. The International Energy Agency projects that data center electricity demand will more than double from 2022 to 2026, largely driven by AI activities. These data centers, essential for functions like cloud storage and financial transactions, are proliferating, contributing significantly to global electricity use and greenhouse gas emissions. AI model training is particularly energy-intensive, with a ChatGPT query requiring ten times more energy than a Google query. This surge in energy use threatens tech companies' climate goals and puts additional pressure on power and water resources, leading to local community resistance and potential regulatory actions. Tech companies are investing in improving energy efficiency, such as through advanced chip hardware, and supporting renewable energy developments. However, there are concerns that increased efficiency might lead to higher overall resource consumption, as posited by Jevons Paradox. Transparency and regulation are deemed crucial to manage AI's environmental impact effectively going forward.