# AI’s booming energy appetite threatens climate targets as data centre demand surges



As Artificial Intelligence (AI) continues to transform industries globally, its increasing energy demands present a formidable challenge. While AI brings innovations and efficiencies across sectors such as healthcare, finance, and manufacturing, its considerable appetite for energy raises crucial questions about sustainability. This energy consumption is largely driven by the infrastructure required for vast data centres and the computational intensity involved in training AI models.

Recent analyses underscore the urgency of this issue, noting that AI-related activities could demand energy equivalent to the output of approximately 50 nuclear power plants operating continuously. This spike in energy consumption threatens to strain existing power grids and complicate climate goals. For instance, data from the International Energy Agency warns that electricity demand from data centres is expected to double from 2022 to 2026, largely due to the proliferation of AI applications. This creates a pressing dilemma: how can AI's benefits be harnessed without exacerbating the climate crisis?

In a stark illustration of this trend, Microsoft’s carbon emissions have surged nearly 30% since 2020, fuelled by the expansion of its data centres to accommodate AI capabilities. Despite the company’s commitment to sustainability goals, including becoming carbon negative by 2030, the energy-intensive nature of AI continues to challenge these ambitions. Tech giants are increasingly recognising the need for better energy efficiency and transparency in their operations. Yet, as Leonard Hyman observed in a letter to the Financial Times, the onus should also be on these companies to account for their energy use and not transfer the burden to consumers. He advocates for policy measures that would hold AI firms accountable for their energy consumption.

Furthermore, Jevons Paradox complicates the picture. While the development of more energy-efficient technologies may seem beneficial, the overall resource consumption might rise, resulting from lower operational costs stimulating greater demand. For instance, a single interaction with models like ChatGPT is reported to consume ten times more energy than a standard Google query—an alarming statistic considering the increasing frequency and scale at which such models are deployed.

Amid this backdrop, there is a growing consensus on the necessity for robust energy ratings for AI systems, similar to those already in place for household appliances. Such ratings could provide consumers and businesses with clear data on the energy costs associated with AI operations, ultimately influencing purchasing decisions and driving vendors to prioritise energy efficiency alongside performance. A proposed Energy Impact Rating could include critical metrics such as the energy costs associated with model training, the energy required for each user session, and the sources of hosting energy—whether renewable or fossil-based.

To mitigate AI's environmental impact and facilitate its integration into a more sustainable future, a collective response involving policymakers, companies, and investors is essential. Policymakers must create incentives for energy-efficient designs, while companies should be transparent about energy usage and commit to optimising systems for reduced consumption. Investors, too, must consider the environmental costs of AI models, not just their capabilities.

As the dialogue around AI and its energy demands evolves, it becomes increasingly clear that while AI alone will not achieve a zero-carbon footprint, it can indeed become a powerful tool for addressing climate challenges. By coupling innovation with responsible regulation and transparency, society can potentialise AI's benefits without compromising environmental integrity. The crucial question remains: are we prepared to demand these measures to ensure AI serves as a force for good in an era of climate uncertainty?

## Reference Map:

* Paragraph 1 – [[1]](https://www.entrepreneur.com/en-gb/technology/when-ai-meets-climate-powering-progress-without-burning/492396), [[4]](https://time.com/6987773/ai-data-centers-energy-usage-climate-change/)
* Paragraph 2 – [[1]](https://www.entrepreneur.com/en-gb/technology/when-ai-meets-climate-powering-progress-without-burning/492396), [[2]](https://www.ft.com/content/30cea896-ec3d-42f0-acc2-add2d911b25e), [[3]](https://www.ft.com/content/61bd45d9-2c0f-479a-8b24-605d5e72f1ab)
* Paragraph 3 – [[4]](https://time.com/6987773/ai-data-centers-energy-usage-climate-change/), [[5]](https://www.lemonde.fr/en/economy/article/2024/06/20/in-the-us-tech-s-insatiable-appetite-for-electricity-is-a-cause-for-concern_6675236_19.html), [[6]](https://apnews.com/article/ec08a6dd7d0152e0376e1787fa90a331)
* Paragraph 4 – [[1]](https://www.entrepreneur.com/en-gb/technology/when-ai-meets-climate-powering-progress-without-burning/492396), [[7]](https://www.axios.com/newsletters/axios-generate-4c9f3850-1552-11f0-8393-f7beb65ab50c)
* Paragraph 5 – [[2]](https://www.ft.com/content/30cea896-ec3d-42f0-acc2-add2d911b25e), [[5]](https://www.lemonde.fr/en/economy/article/2024/06/20/in-the-us-tech-s-insatiable-appetite-for-electricity-is-a-cause-for-concern_6675236_19.html)
* Paragraph 6 – [[2]](https://www.ft.com/content/30cea896-ec3d-42f0-acc2-add2d911b25e), [[3]](https://www.ft.com/content/61bd45d9-2c0f-479a-8b24-605d5e72f1ab)
* Paragraph 7 – [[1]](https://www.entrepreneur.com/en-gb/technology/when-ai-meets-climate-powering-progress-without-burning/492396), [[4]](https://time.com/6987773/ai-data-centers-energy-usage-climate-change/)

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## Bibliography

1. <https://www.entrepreneur.com/en-gb/technology/when-ai-meets-climate-powering-progress-without-burning/492396> - Please view link - unable to able to access data
2. <https://www.ft.com/content/30cea896-ec3d-42f0-acc2-add2d911b25e> - In a recent letter to the Financial Times, Leonard Hyman highlights the escalating energy consumption of AI companies and their lack of transparency regarding energy needs. He points out that AI operations in the U.S. could demand energy equivalent to 50 nuclear power plants running continuously, posing significant challenges to the existing power grid. Hyman argues that AI firms should be mandated to provide, transmit, and back up their own power, rather than shifting the burden onto average electricity consumers. He suggests that holding AI companies accountable for their energy expenses could incentivize them to pursue greater energy efficiency and calls for policy measures to ensure they do not benefit from implicit energy subsidies funded by the public.
3. <https://www.ft.com/content/61bd45d9-2c0f-479a-8b24-605d5e72f1ab> - Microsoft's carbon emissions have surged nearly 30% since 2020, driven by the need to expand data centers for AI and cloud computing, according to its latest sustainability report. This expansion, necessary to keep up with competition from Amazon and Google, has significantly increased Microsoft's supply chain emissions by 30.9%, overshadowing a 6.3% reduction in its direct and energy-related emissions. Although the company has committed to ambitious environmental goals, including becoming carbon negative and zero waste by 2030, the energy-intensive nature of AI development poses a challenge to these targets. To mitigate its growing carbon footprint, Microsoft announced plans to ensure certain high-volume suppliers use 100% carbon-free electricity by 2030 and to support $10 billion in renewable energy projects. The reliance on carbon-intensive construction materials for data centers, such as cement and steel, complicates efforts to align AI development with sustainability goals.
4. <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.
5. <https://www.lemonde.fr/en/economy/article/2024/06/20/in-the-us-tech-s-insatiable-appetite-for-electricity-is-a-cause-for-concern_6675236_19.html> - La demande insatiable d'électricité des géants technologiques américains, alimentée notamment par le développement de centres de données et l'intelligence artificielle, provoque des inquiétudes. Microsoft, dont les émissions de carbone ont augmenté de 30% en quatre ans, illustre cette tendance. La consommation d'électricité des centres de données américains devrait augmenter de 4% à 6% entre 2022 et 2026. Des mesures telles que l'achat de crédits d'énergie renouvelable ou des accords d'achat de l'électricité verte sont prises pour réduire l'empreinte carbone. Cependant, la demande croissante d'électricité suscite la crainte de pénuries, accentuées par la fermeture prévue de centrales à charbon et nucléaires. Les opérateurs de réseaux électriques, comme celui de PJM, envisagent des solutions pour assurer la disponibilité et la fiabilité de l'approvisionnement électrique face à cette explosion de la demande.
6. <https://apnews.com/article/ec08a6dd7d0152e0376e1787fa90a331> - The editorial roundup covers four significant issues in Texas. The "Austin American-Statesman" criticizes the University of Texas at Austin's heavy-handed police response to student protests about the Gaza war, arguing it violated principles of free speech without addressing protesters' concerns respectfully. The "Dallas Morning News" highlights concerns over the state's power grid, stressing the need for diversified power sources and improved transmission infrastructure to support industrial growth and extreme weather impacts. The "Fort Worth Star-Telegram" urges the Texas legislature to address the lack of air conditioning in prisons, emphasizing the health risks for both inmates and staff and warning of potential costly federal interventions. Finally, the "Houston Chronicle" raises alarms about the state's preparedness for the increasing energy demands of AI data centers, advocating for better planning and legislative actions to ensure grid reliability. Additionally, AIM Media Texas discusses the potential implications of a federal ruling against states denying Medicaid coverage based on gender-related treatments, expressing concerns about access to healthcare for immigrants in Texas.
7. <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.