#WhyESGMatters

AI and the clean energy transition

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AI and the clean energy transition

The data centre boom is driving investment in renewable energy and battery storage, helping to accelerate the energy transition. However, the economic benefits will depend largely on the successful adoption of AI, while rising energy demand and environmental concerns remain key challenges. We look at the role of renewable power purchase agreements, AI technology and efficiency gains, and data centre battery storage demand.

Did you know?

- On average, at least **USD6.3trn** per year in climate finance will be needed until 2030 to avoid the worst impacts of climate change.
- Global energy transition investment has grown at an annual rate of **20%** to **USD2.3trn** over the past 10 years to 2025.
- The data centre market currently consumes up to **1.5%** of global electricity.
- AI-related private investments in the US rose by **23.5%** y-o-y in Q1 2026.
- By 2030, global data centre onsite battery capacity is estimated to increase by more than **100GW**.
- The technology sector represented **40%** of all global corporate renewable power purchase agreements in 2025.

Sources: Climate Policy Initiative, BloombergNEF, Bureau of Economic Analysis, IEA, S&P Global, HSBC

AI driving climate tech investment

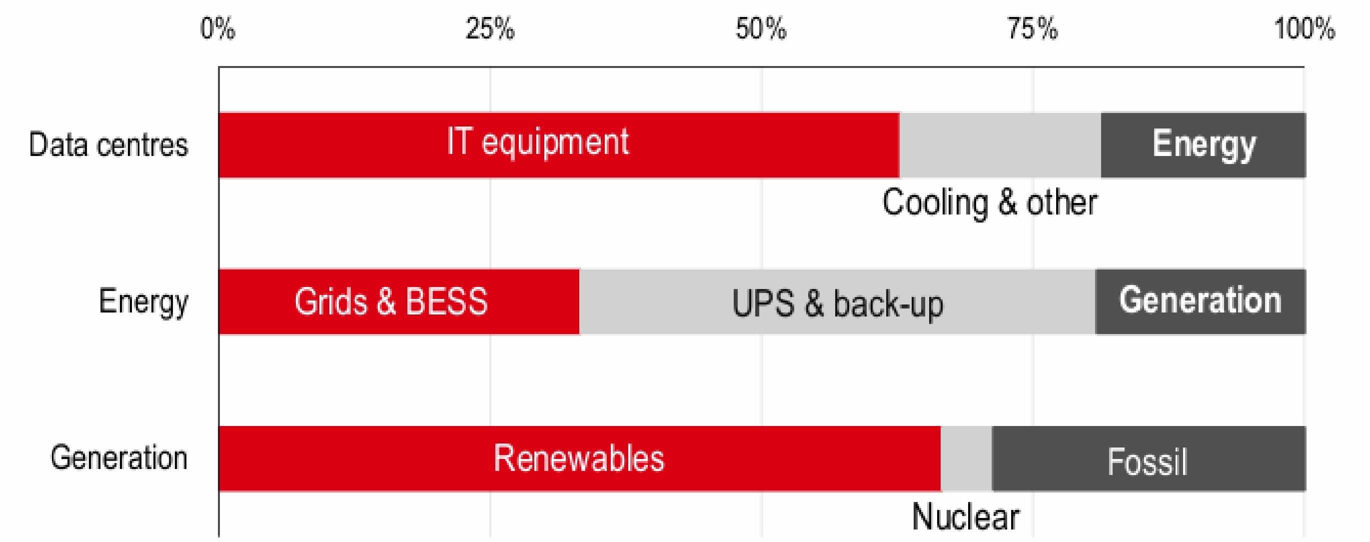
The rapid adoption of artificial intelligence (AI) and the expansion of data centres are creating significant investment opportunities across climate technology. Rising electricity demand is expected to support growth in renewable energy, battery storage and electricity network upgrades, particularly in the United States.

Energy investment linked to US data centre construction reached an estimated USD105bn in 2025, with renewable energy accounting for the majority of energy generation investment (Chart 1). AI investment is also increasing. US private sector investment in AI rose by 23.5% year-on-year in the first quarter of 2026, with this expansion benefitting Asian exporters that supply data centre infrastructure to the United States and other markets.

Australia's data centre market is also booming, supported by domestic energy supplies and imported equipment. The potential economic benefits include stronger local technology capabilities, wider AI adoption and growth in professional services exports. However, the country faces significant energy and water constraints, with some estimates suggesting that Australia could face an energy shortfall of 40% by 2028[1]. Renewable energy development, grid investment and effective water policies will therefore be important to sustain future growth.

In China, glass-based upgrades for AI chip packaging are creating opportunities to improve efficiency and performance. Glass could provide a lower cost alternative to silicon for certain packaging applications, while reducing warping, improving power delivery and lowering electrical resistance. From a sustainability perspective, these advances could support more efficient computing, reduce electricity consumption and limit material waste, helping to lower AI's overall energy use and carbon footprint.

Chart 1. Global data centre and energy investments (2025)



Source: IEA (2026). Notes: BESS = battery energy storage system, UPS = uninterruptable power supply

1. CBRE – The Infrastructure of AI: Power Needs, January 2025

Expanding renewable energy agreements

Data centres are increasingly using renewable energy power purchase agreements (PPAs), enabling organisations to buy electricity at an agreed price while supporting clean energy development. Around 40% of renewable PPAs were agreed in the United States in 2024, with approximately 65% supporting data centres over the past five years (Chart 2).

PPA costs could rise as subsidies under the US Inflation Reduction Act are phased out. This coincides with growing electricity demand from AI and data centres, which could make climate targets more difficult to achieve and increase exposure to energy price volatility. Higher costs may also make renewable power less accessible to other industries competing with technology companies.

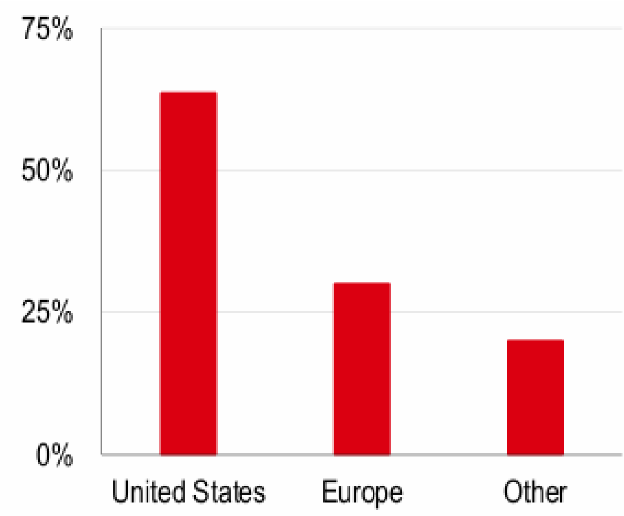
Nevertheless, technology firms remain significant drivers of renewable energy procurement and investment, accounting for 40% of global corporate renewable PPAs in 2025. Data centres represented almost half of this activity[2].

Growing demand for electricity

Data centres currently consume up to 1.5% of global electricity. Continued expansion and the localisation of data centres could place further pressure on electricity prices and grid capacity. By 2050, data centres are estimated to require more than 4,000 terawatt-hours of electricity, while in some markets they could account for up to 10% of electricity demand by 2035[3].

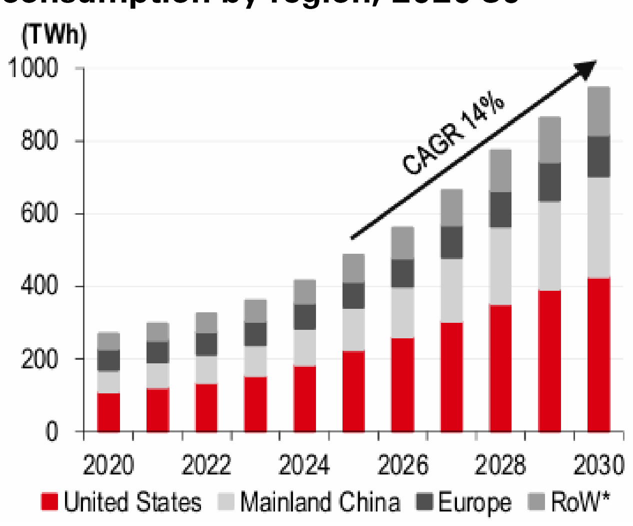
Fossil fuels currently provide almost 60% of global power[4]. However, data centre expansion is expected to encourage greater renewable integration, with renewables potentially accounting for more than half of additional generation capacity by 2035[5]. Renewable energy, storage and electricity network investment are therefore likely to benefit from both AI growth and the wider net zero transition.

Chart 2. Data centre share of renewable PPAs by region, 2021-25



Sources: International Energy Agency, S&P Global (2026)

Chart 3. Data centre electricity consumption by region, 2020-30



Source: International Energy Agency (2025)

2. 'Key Questions on Energy and AI', IEA, April 2026
3. 'Global Data Center Power Demand Outlook', BNEF, 2025
4. 'Energy and AI', IEA, 2025
5. 'Global Data Center Power Demand Outlook', BNEF, 2025

The role of battery storage

Battery technology is becoming more important as grid constraints and energy supply uncertainty increase. Onsite generation and storage can help data centres access power more quickly, reduce pressure on electricity grids and manage fluctuations in AI-related demand.

Global onsite battery capacity for data centres is expected to increase by more than 100 gigawatts by 2030, with longer duration energy storage systems also expected to expand, rising from 5 gigawatts in 2025 to 25 gigawatts by 2030[6]

Public acceptance and sustainability

Communities in several markets are raising concerns about energy affordability, environmental impacts such as water use and employment opportunities. In the United States, proposed moratoriums have emerged in response to concerns about new construction, while~~,~~ in Europe, campaigns have sought to delay or halt some data centre projects. As energy prices rise, the risk of further increases linked to data centre demand could prompt additional resistance.

Public acceptance will depend on whether developers can provide stable and affordable energy, manage water use responsibly, deliver meaningful local economic benefits, and expand renewable generation and battery storage alongside new data centres. Initiatives such as the United Nations' AI Environmental Transparency Initiative, which includes environmental disclosures and renewable energy targets, could support more sustainable development by improving transparency around affordability and environmental impacts.

Conclusion

AI and data centres are creating significant opportunities for renewable energy, battery storage, electricity networks and emerging technologies such as geothermal energy and small modular reactors. However, the long-term success of these investments will depend on managing energy, water and community impacts responsibly. Ensuring that AI growth supports cleaner, more resilient and affordable energy systems will be critical to achieving wider climate objectives.

6. 'Key Questions on Energy and AI', IEA, April 2026

Disclosure appendix

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