ASIA CLEAN ENERGY FORUM 2026

Beyond Transition: Building Secure, Resilient, Inclusive, and Intelligent Energy Systems

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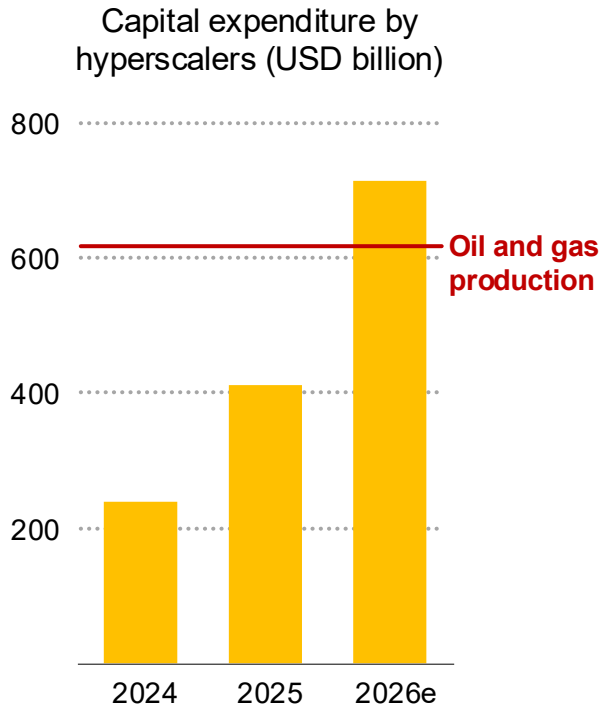
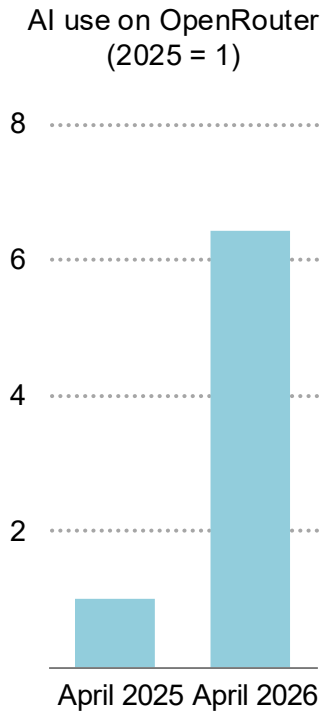
Powering the Digital Economy: Turning Data Center Growth into Energy Transition Opportunity

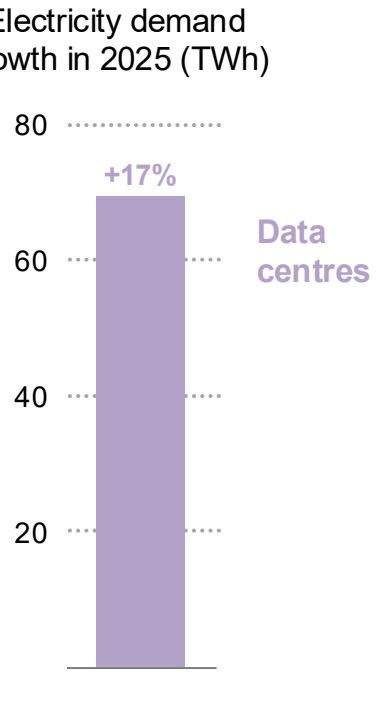
Key questions on energy and AI

11 June 2026, Natalie Kauf
International Energy Agency

The AI and energy nexus is evolving rapidly







Capital expenditure from just five technology companies – largely on data centres – is now larger than global investment in oil and natural gas production; data centre electricity demand grew by almost 20% in 2025.

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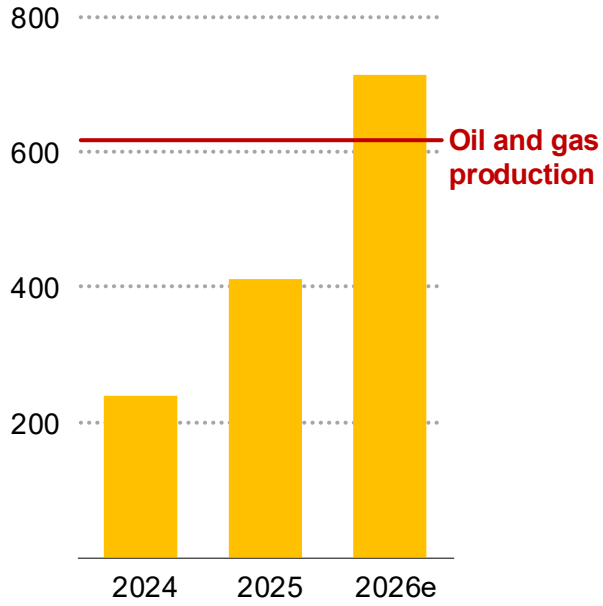
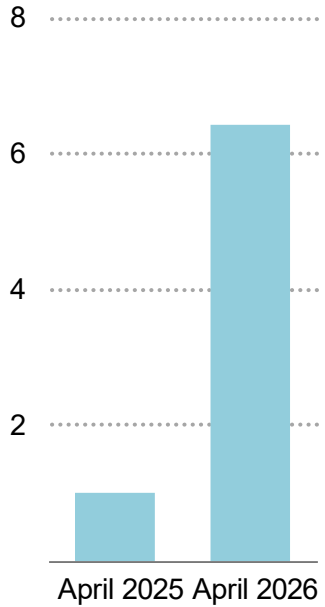
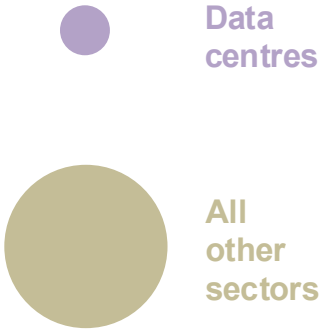
Capital expenditure by hyperscalers (USD billion)



AI use on OpenRouter (2025 = 1)



Electricity demand growth in 2025 (TWh)



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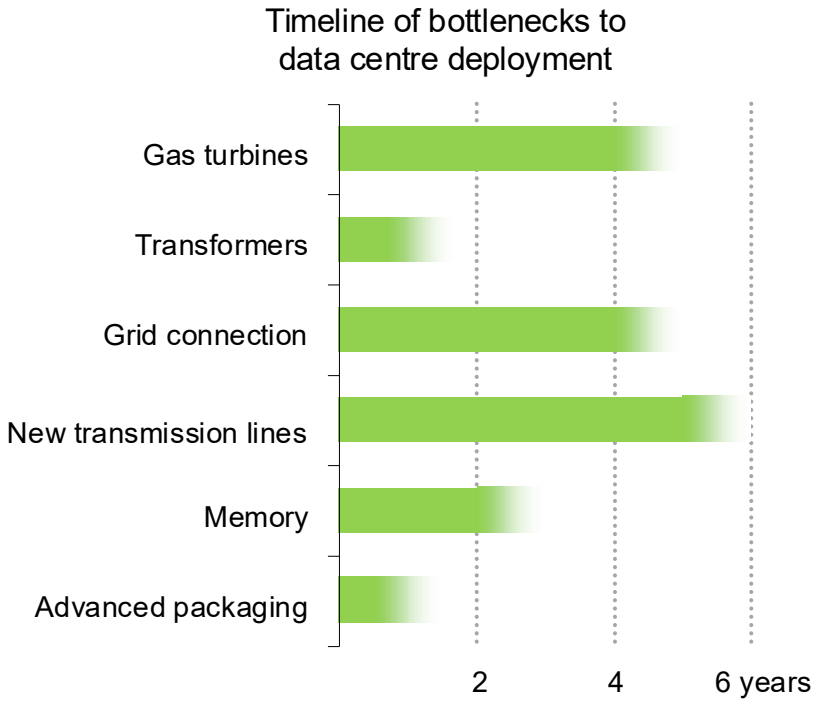
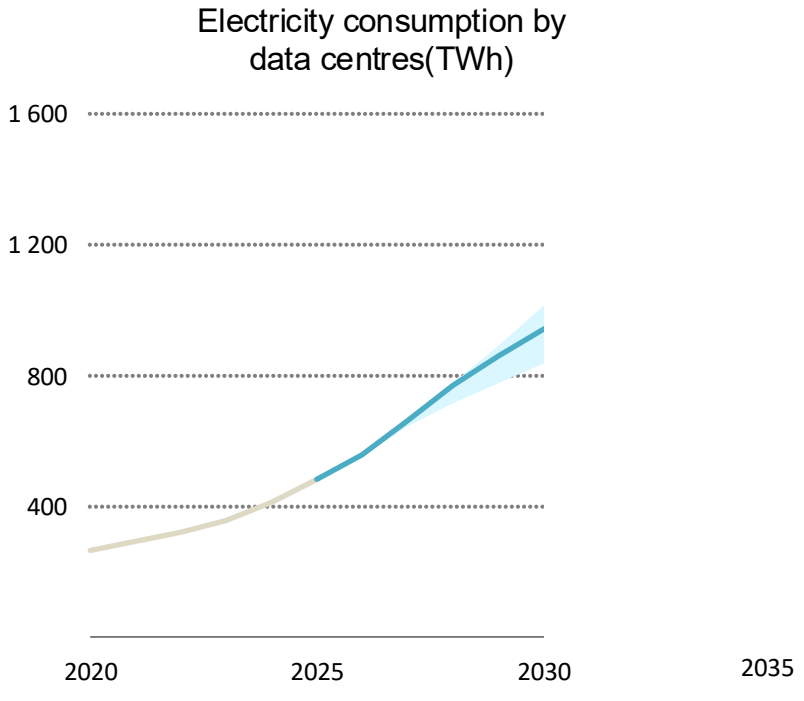
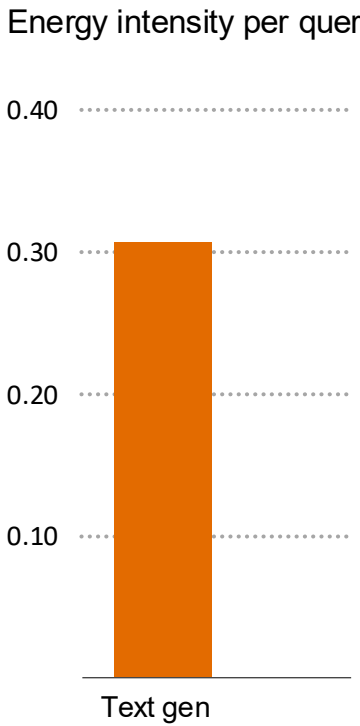
AI is hitting real-world speed bumps



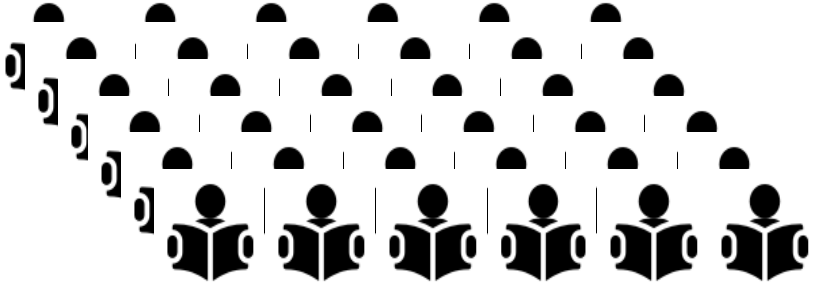


Despite all this dynamism, our central data centre demand outlook to 2030 remains close to the trajectory set out in our 2025 report, as bottlenecks in energy and technology supply chains constrain the near-term outlook.

AI’s projected energy growth rests on the rise of new modes



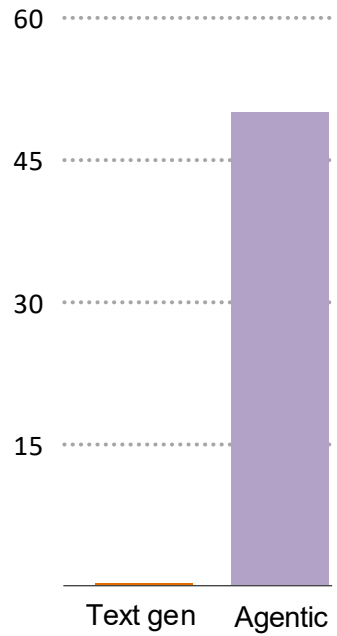
Simple text generation consumes **so little energy** that today’s data centre electricity consumption could generate more text than the **entire global adult population together could read in a year**



The efficiency of models and hardware is improving faster than any energy technology in energy history; the level of investments and projected electricity consumption implies surging growth in new modes, like AI agents

AI's projected energy growth rests on the rise of new modes

Energy intensity per query (Wh)



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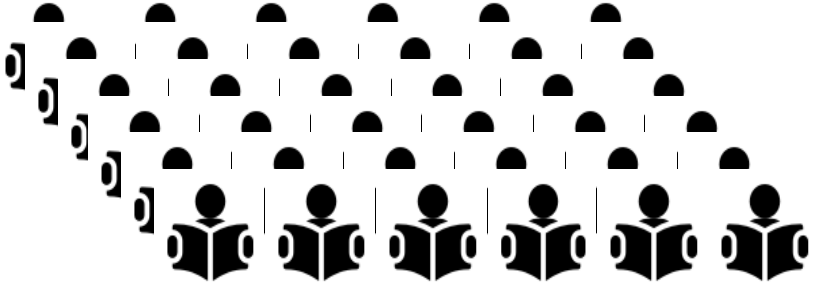

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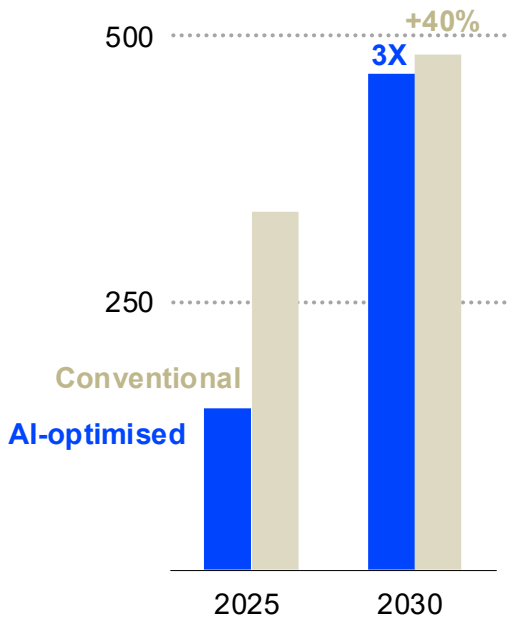
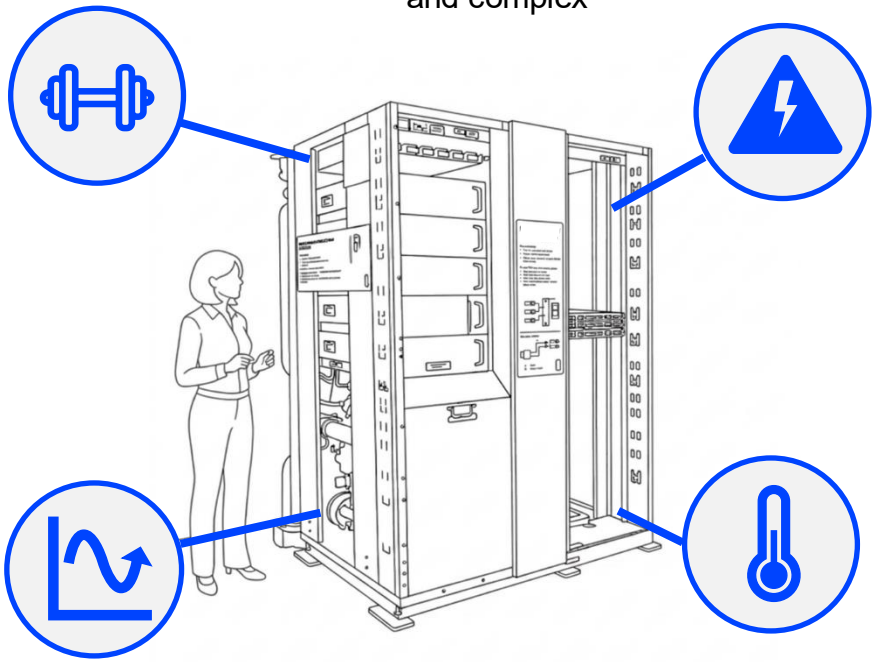
AI drives the outlook and transforms data centre power needs

Electricity consumption by data centres (TWh)

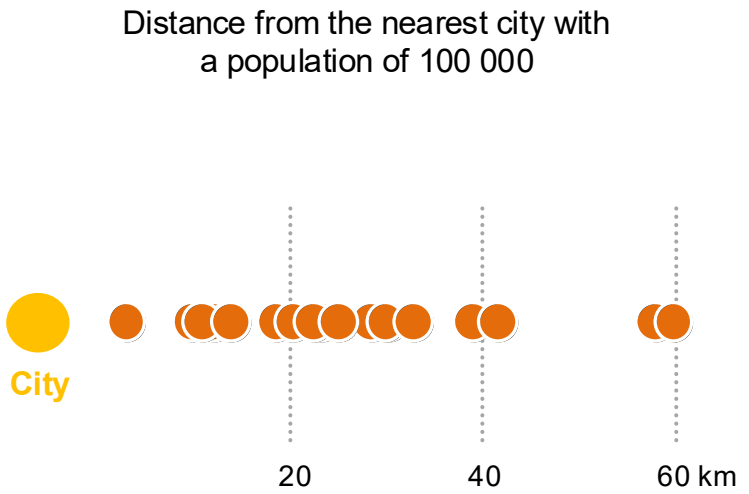


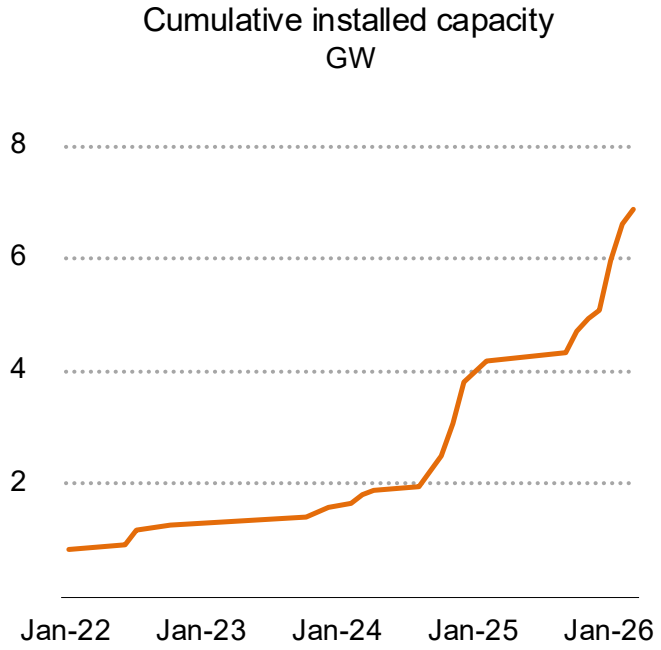
AI data centres are more power hungry and complex



AI-optimised data centres drive electricity demand growth from the sector; their unique power needs are pushing electrical technologies and supply chains to evolve at unprecedented speeds.

Large AI data centres are being constructed at a rapid pace

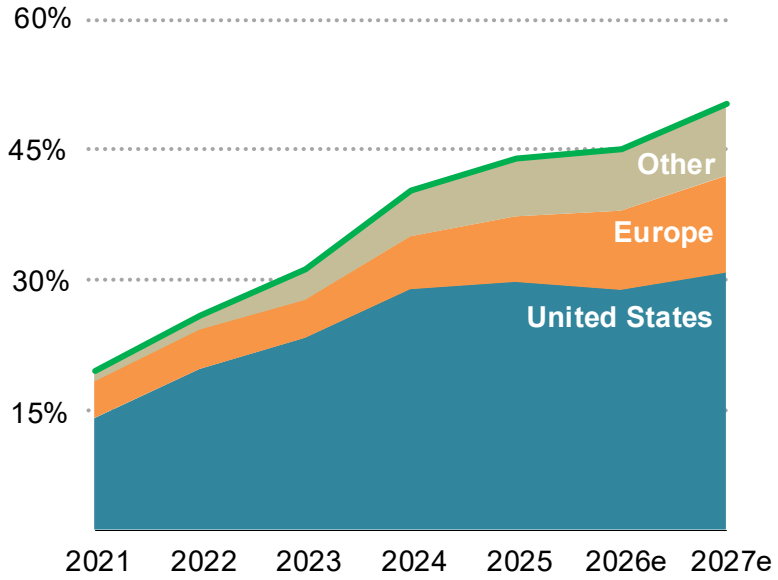




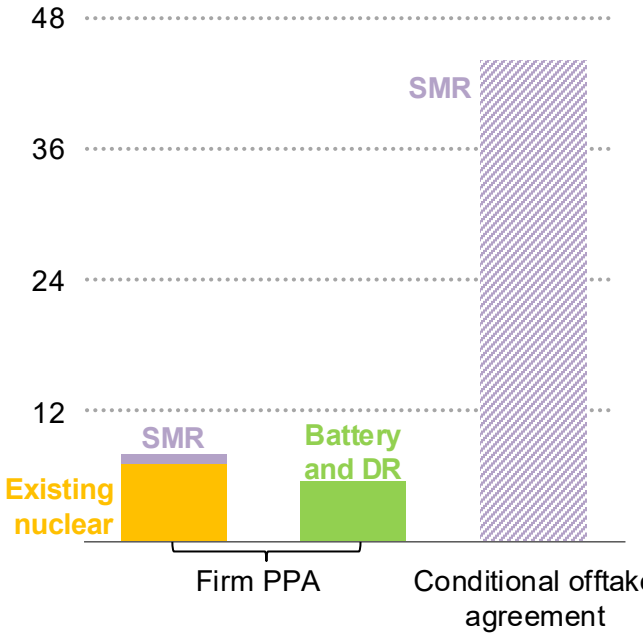
19 of the 21 large AI data centres under construction in the United States are within 65 km of a city with a population of at least 100 000. Such data centres are being constructed at a rapid pace.

Data centre operators are driving electricity sector innovation…

Total data centre electricity demand covered by renewables PPAs

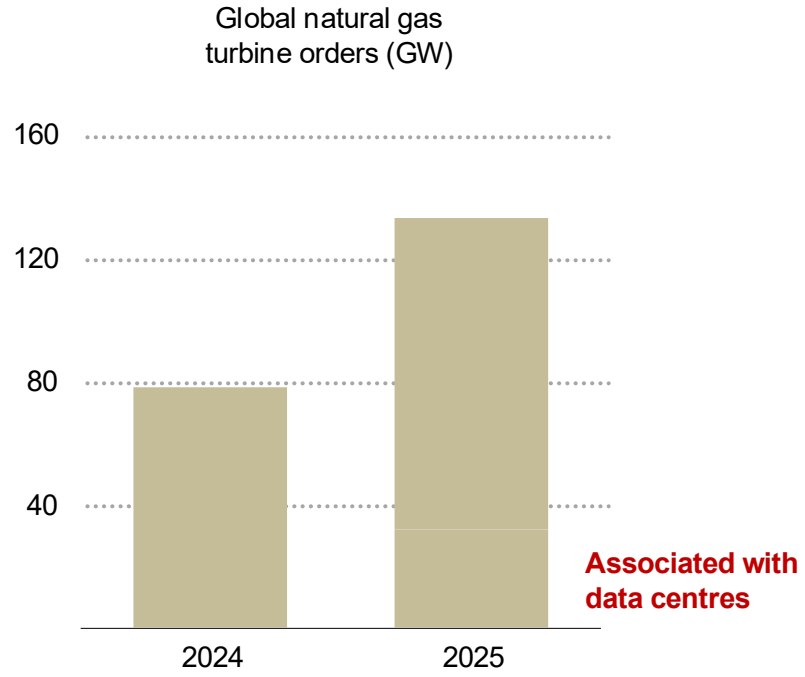


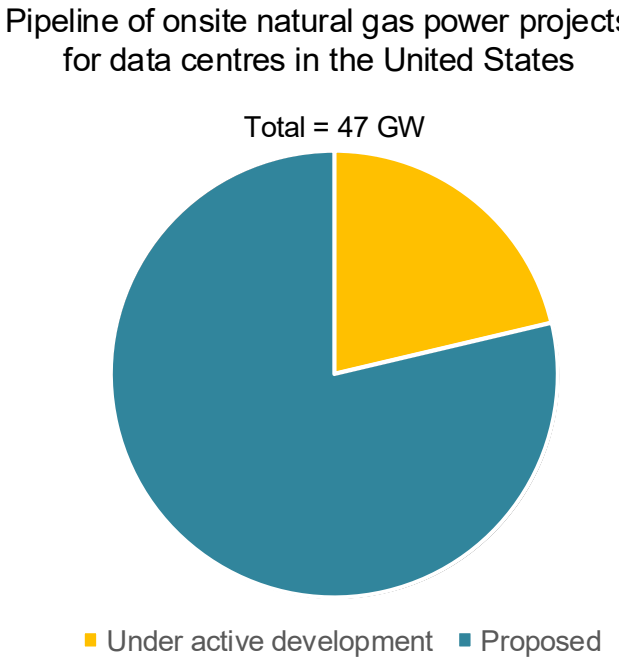
PPAs and offtake agreements in firm power technologies for data centres (GW)



The tech sector continues to be the largest corporate procurer of renewables PPAs, but has also led the way in contracting existing nuclear and signing offtake agreements with novel technologies like SMRs and batteries

…including onsite power generation

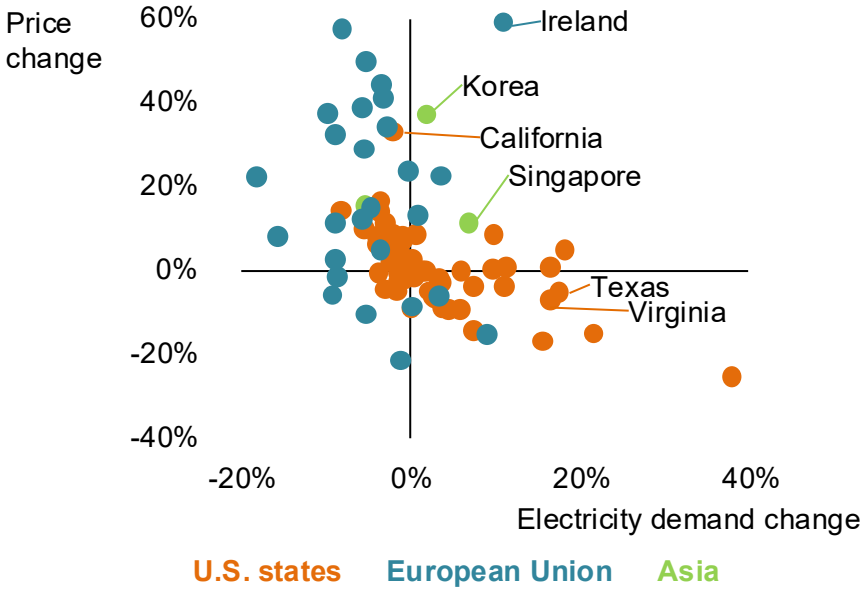




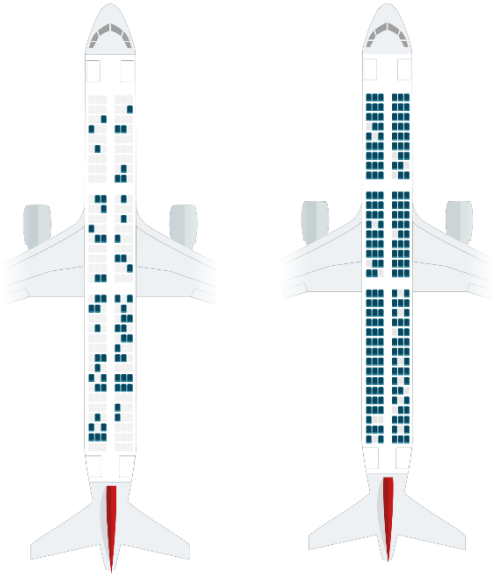
A generalised trend of load growth and electrification, combined with data centre demand in some regions, has led to a surge in turbine orders; there is growing interest in onsite projects, but questions remain.

Load growth is not necessarily associated with higher prices

Change in real retail electricity price versus change in electricity demand, 2019-2024



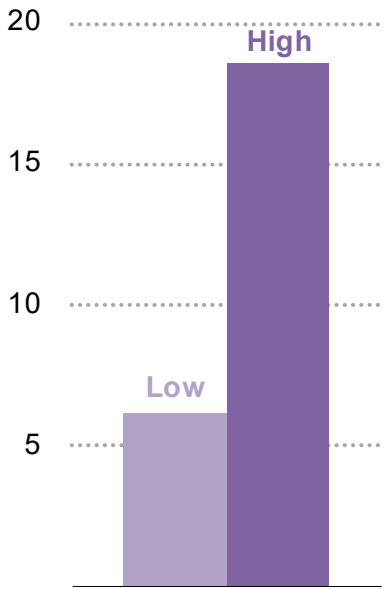
Load factors and **capacity utilisation** play a key role in determining costs



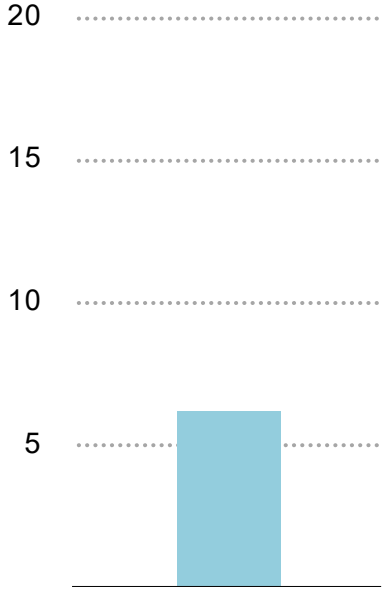
Load growth does not necessarily raise per unit prices, but data centres present specific challenges; smart and efficient integration across the value chain will be critical to making sure that their growth can be met affordably

If AI boosts GDP, the energy demand impacts will be lower

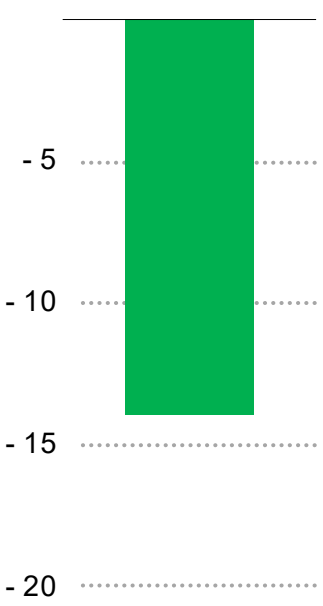
Estimated energy demand impact of AI-driven GDP boost, 2035 (EJ)



Energy demand from data centres, 2035 (EJ)



Energy savings potential from AI, 2035 (EJ)



New IEA modelling shows that an AI-driven GDP boost would not lead to a proportional increase in energy demand; energy policies and energy technologies matter more for shaping the future of energy demand

Thank you