



The Energy and AI Nexus

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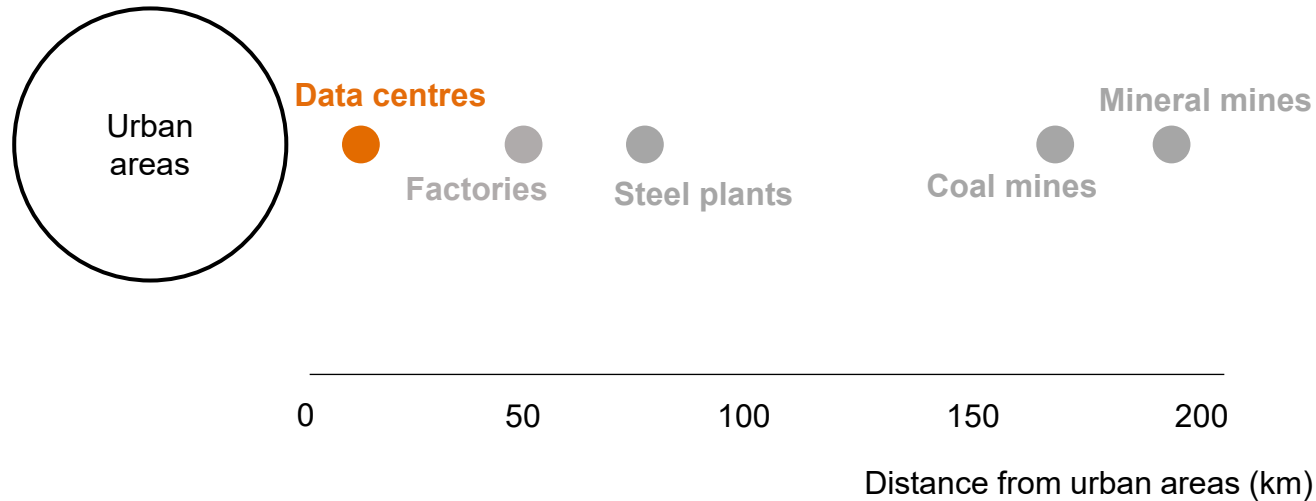
Office of the Chief Energy Economist

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Data centres cluster together

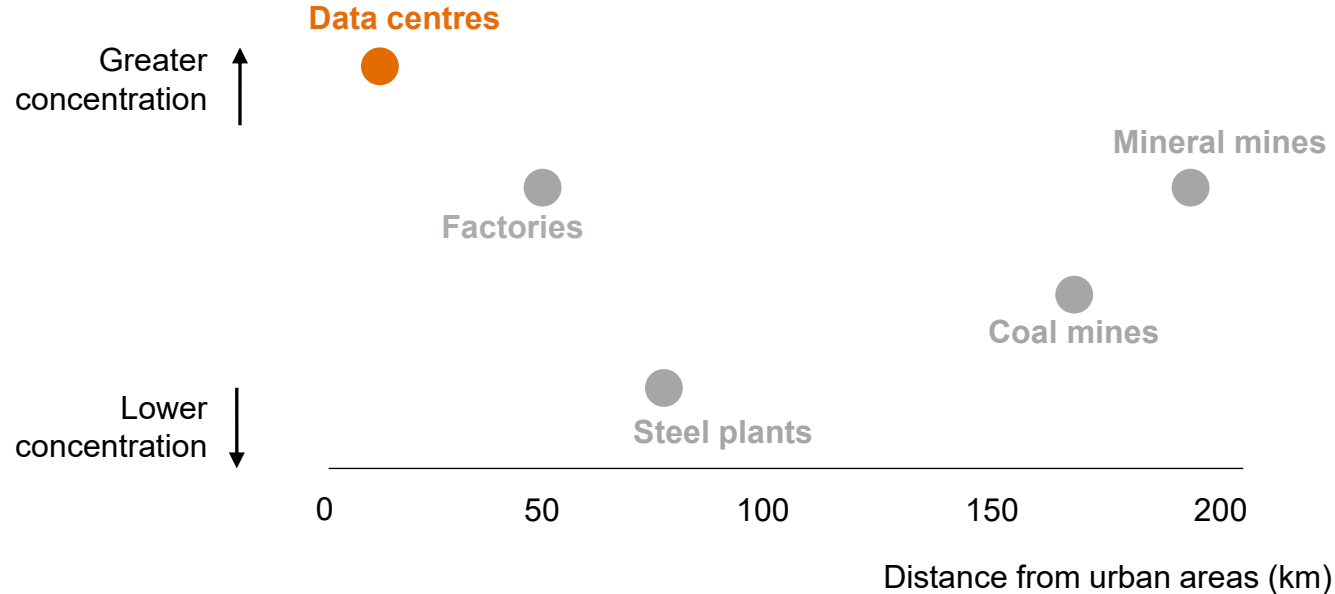
Proximity of selected infrastructure to urban areas



Data centres are both power intensive and tend to cluster together, creating challenges for local grids.

Data centres cluster together

Proximity of selected energy consumers to urban areas and spatial concentration



Data centres are both power intensive and tend to cluster together, creating challenges for local grids.

Data centres cluster together – and are growing in size

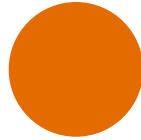
Household equivalents of data centre electricity consumption

Hyperscaler
today



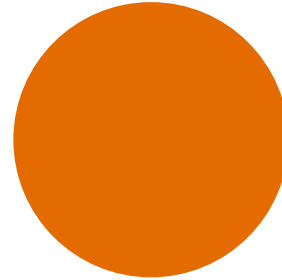
100 000
households

Largest under
construction



2 million
households

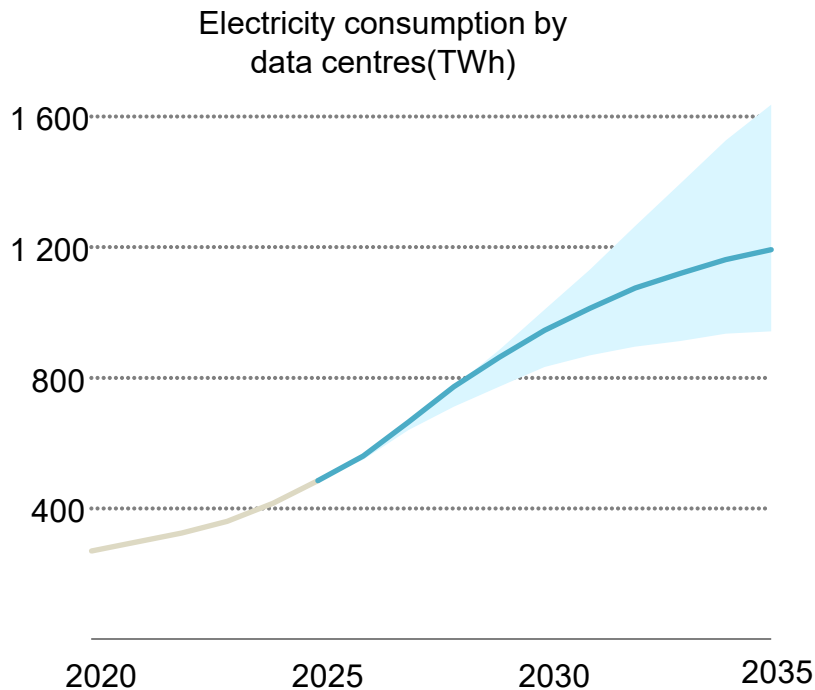
Largest
announced



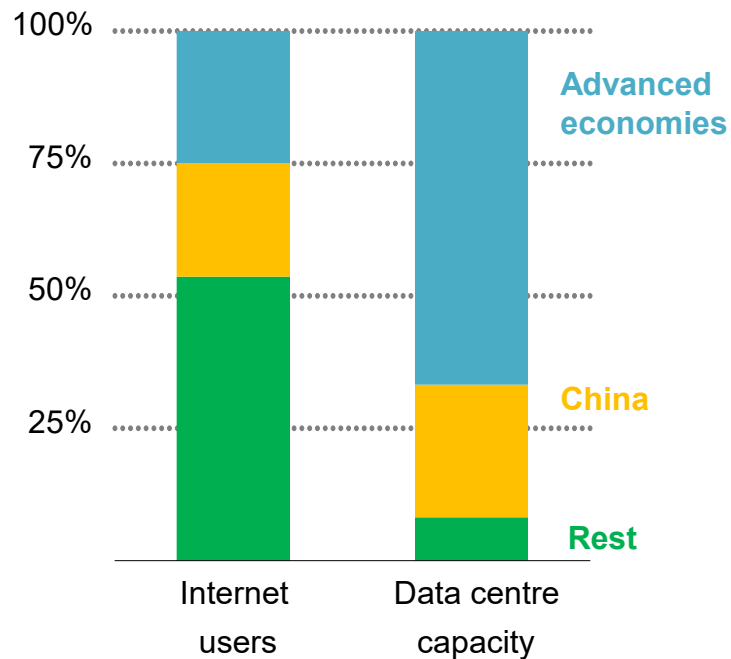
5 million
households

Data centres are both power intensive and tend to cluster together, creating challenges for local grids. They are also increasing in size, with the largest under construction 20 times larger than a typical hyperscaler today

New data centres are emerging rapidly, but is unevenly divided

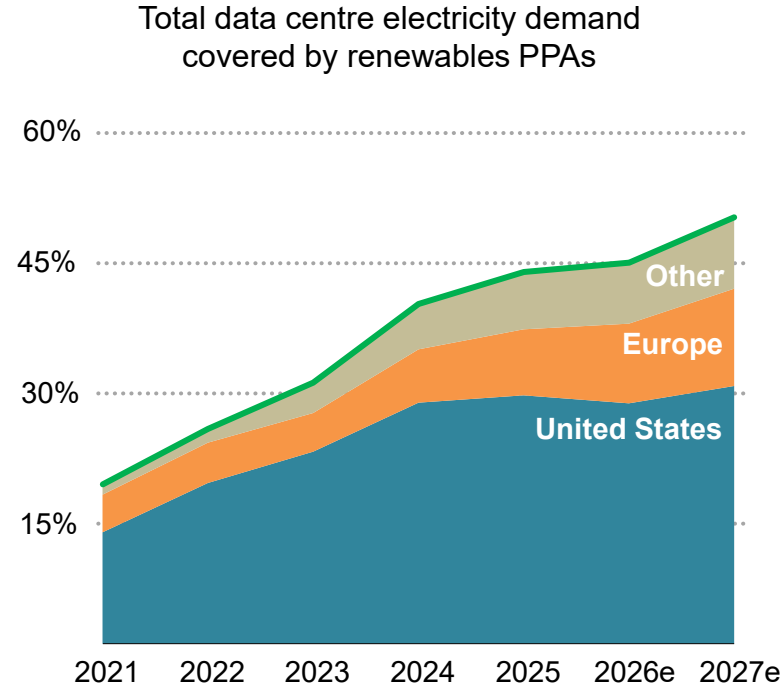


Metrics of IT use and data centre capacity, 2024



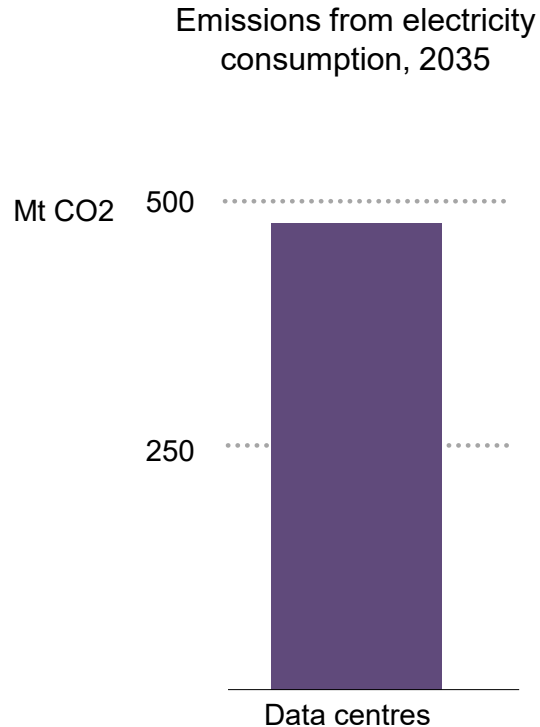
Data centre electricity consumption is on track to double by 2030. AI data centres grow even faster. However, data centres remain highly concentrated in a few large economies.

Data centre operators are procuring clean energy



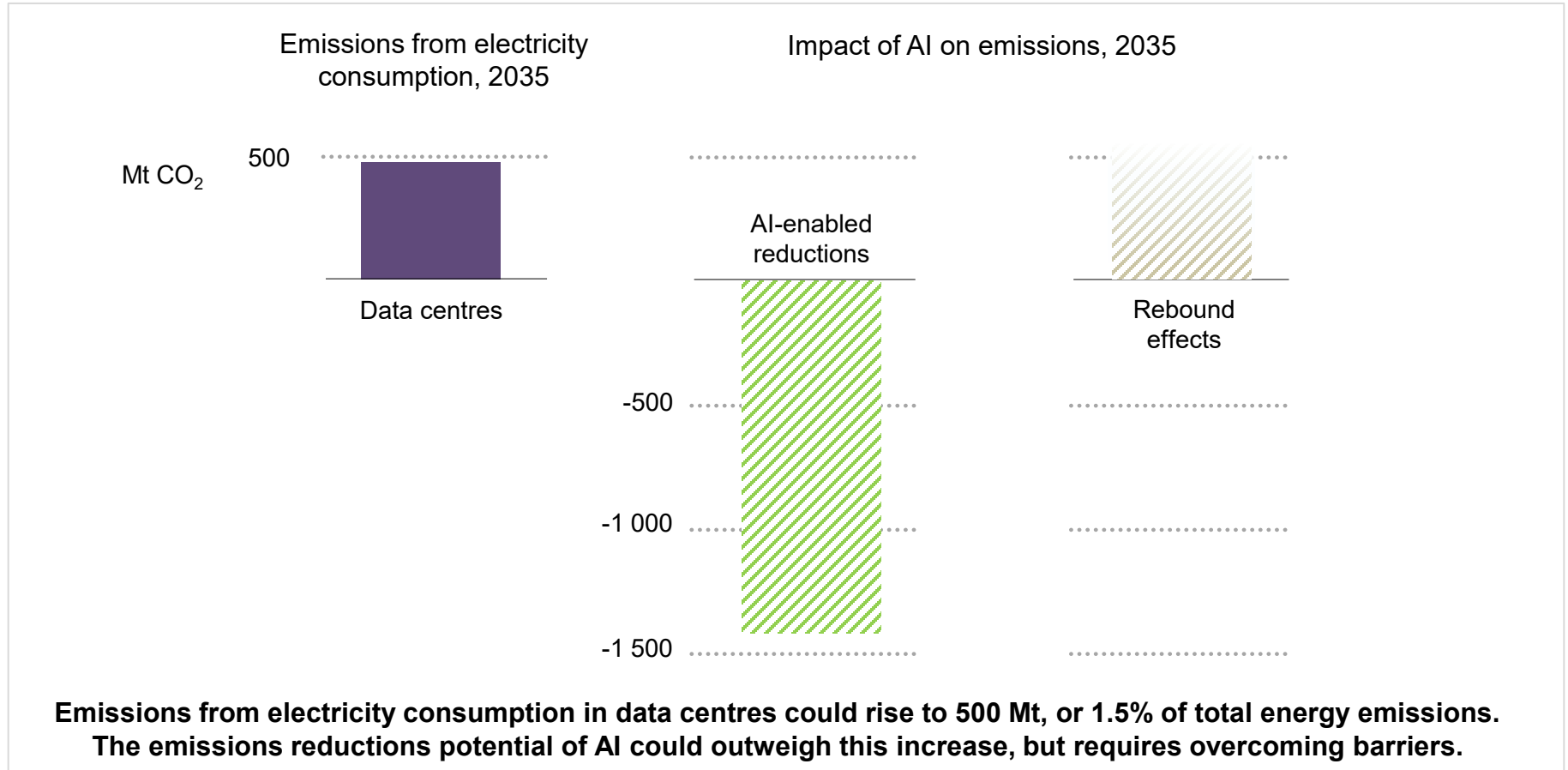
The tech sector continues to be the largest corporate procurer of renewables PPAs, but has also led the way in contracting existing nuclear and signing offtake agreements with novel technologies like SMRs and batteries

The net impact of AI on emissions depends on how it is used

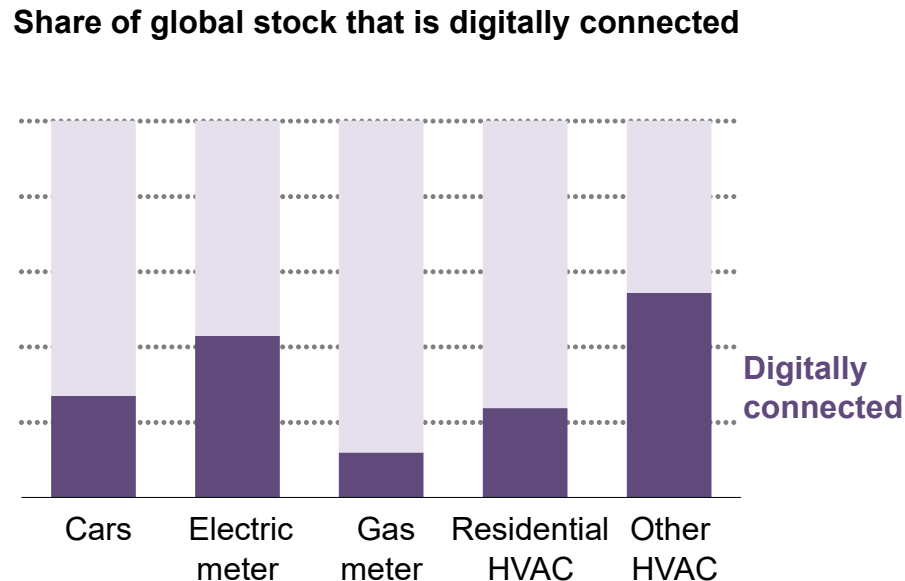
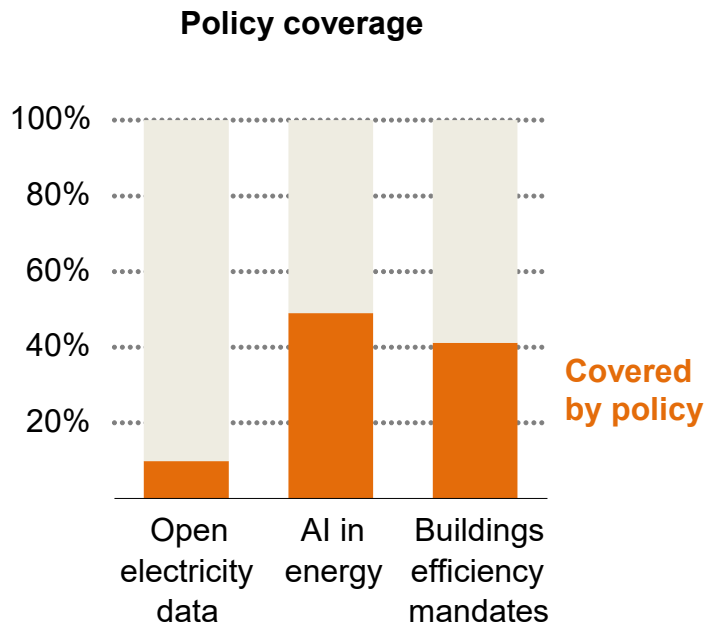


Emissions from electricity consumption in data centres could rise to 500 Mt, or 1.5% of total energy emissions.

The impact on emissions depends on the uptake of AI in energy



Overcoming barriers is vital to unlock AI's benefits in energy



Policies supporting the adoption of AI applications in the energy sector are still lacking, while digital infrastructure coverage remains insufficient

