Data center energy storage nuku alofa

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Duncan is the Director of TMT Research for Deloitte Canada, and is a globally recognized expert on the forecasting of consumer and enterprise technology, media & telecommunications trends. He presents regularly at conferences and to companies on marketing, technology, consumer trends, and the longer term TMT outlook. He also works with individual clients (across all industries) in assessing the impact of technological, demographic, and regulatory changes on their business strategies.

Kate Hardin leads Deloitte"s research team focused on the implications of the energy transition for the industrial, oil, gas, and power sectors and has an experience of more than 25 years in the energy industry. Before that, she led IHS Markit Ltd"s integrated coverage of transportation decarbonization and the implications for automotive and energy companies.

Ariane is a Partner and TMT Industry leader in France. She has 20+ of experience and is a chartered and certified public accountant. Her knowledge covers IFRS and publicly-listed company requirements as well as international audit and project coordination. She also leads the TMT Audit practice and her past experience includes audit of international media and technology groups and vendor due diligence assignments. She began her career with Arthur Andersen and joined Deloitte France in 2002.

Deloitte predicts that both the technology and electric power industries can and will jointly address these challenges and contain the energy impact of AI--more specifically, gen AI. Already, many big tech and cloud providers are investing in carbon-free energy sources and pushing for net-zero targets,8 demonstrating their commitment to sustainability.

The surge in electricity demand is largely due to hyperscalers" plans to build out data center capacity,

globally.9 As AI demand--specifically gen AI--is expected to grow, companies and countries are racing to build more data centers to meet that demand. Governments are also establishing sovereign AI capabilities to maintain tech leadership.10 The data center real estate build-out has reached record levels based on select major hyperscalers" capital expenditure, which is trending at roughly US$200 billion as of 2024, and estimated to exceed US$220B by 2025.11

Moreover, Deloitte"s State of Generative AI in the Enterprise survey noted that enterprises have been mostly piloting and experimenting until now.12 But as they experiment with getting value from gen AI, respondents are seeing tangible results and so intend to quickly scale up beyond pilots and proofs of concept. If usage grows as the technology matures, hyperscalers" and cloud providers" capital expenditure will most likely remain high through 2025 and 2026.

Data centers" energy consumption has been surging since 2023, thanks to exploding demand for AI.14 Deploying advanced AI systems requires vast numbers of chips and processing capacity, and training complex gen AI models can require thousands of GPUs.

Total AI computing capacity, measured in floating-point operations per second (FLOPS), has also been increasing exponentially since the advent of gen AI. It"s grown 50% to 60% quarter over quarter globally since the first quarter of 2023 and will likely grow at that pace through the first quarter of 2025.19 But data centers don"t only measure capacity in FLOPS, they also measure megawatt hours (MWh) and TWh.

Moreover, training LLMs is energy intensive. Independent research of select LLMs that were trained on more than 175 billion parameters of data sets demonstrated that they consumed anywhere between 324 MWh and 1,287 MWh of electricity for each training run ... and models are often retrained.21

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