

AI's insatiable appetite for energy

The rapid expansion of AI datacentres is placing increasing demands on electricity providers and energy grids. Velika Talyarkhan and Michael Yamoah examine the challenges for governments and companies.

Setting the scene

The rapid adoption of artificial intelligence (AI) across various sectors has prompted a similar growth in datacentres. But these huge computational hubs are energy hungry, putting a strain on local energy supplies, and other users' energy security. For electricity utilities trying to serve all customers, and national and regional grids trying to balance loads, there are systemic challenges to address. However, innovative design, sustainable practices, and strong board oversight can help mitigate risks and build responsible, resilient infrastructure for a rapidly digitising world.

Accurate forecasting is crucial for energy utilities, which must consider how rising demand may fundamentally reshape grid infrastructure requirements.

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Generative AI models have been hailed as a breakthrough in computing, promising efficiencies across a roster of industries. But these efficiencies will come at a cost – AI models require vast datacentres churning billions of data sets to train and run their computations. That consumes energy and water, which is required to cool the servers. How will these needs be met, without disadvantaging others or putting the stability of energy supplies at risk?

Trying to predict how much energy will be needed is difficult. The International Energy Agency estimates that electricity use by datacentres could double by 2030, while others expect it to grow by over 165%.¹ This variation in forecasting is due to uncertainty about how quickly AI will be adopted, and how efficient it will become, as new technologies such as Nvidia's energy saving systems² develop.

But accurate forecasting is crucial for energy utilities, which must consider how rising demand may fundamentally reshape grid infrastructure requirements. Datacentre energy consumption may also impact their capital allocation strategies. Another challenge for planners is that AI innovation cycles typically span two to three years, while power assets last 20 to 40 years. This raises the risk of asset stranding or financial

¹ [AI to drive 165% increase in data center power demand by 2030 | Goldman Sachs](#)

² [Nvidia stakes new startup that flips script on data center power](#)

underperformance, as efficiency gains may make infrastructure surplus to requirements at times. It also adds complexity to electricity system planning and renewable energy integration strategies.

Governments have already begun to wrestle with these challenges, mindful of the dangers of widespread grid outages, such as that which hit Spain and Portugal in April 2025.³ China is seeking increased supply via investment in renewable energy alongside centralised efficiency mandates.⁴ Europe has opted for regulatory-driven efficiency and transparency standards⁵ while Japan has prioritised 'green'-aligned operators for new datacentres.⁶ India requires energy-efficient models and computing solutions, but has avoided strict regulation.⁷ Singapore replaced its moratorium on new datacentres with strict efficiency conditions.⁸

Increased energy and water usage

Datacentres' massive electricity consumption may be met through on-grid or off-grid electricity generation. The latter gives companies more control over security of supply, particularly in regions with grid constraints or instability.

The vast quantity of water required by datacentres to cool their servers and storage units is another critical concern, especially in areas of water scarcity. The average datacentre uses 300,000 gallons of water a day, equivalent to water use in 1,000 homes.⁹ The industry is responding to this concern with closed loop cooling systems that eliminate water waste from evaporation,

and advanced cooling strategies that avoid water use entirely. While operators such as Amazon can achieve high water usage effectiveness (WUE) through scale,¹⁰ challenges remain, including hidden water use from electricity generation.¹¹

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\$64bn

in projects, partly due to concerns about health risks.

Datacentres are often located in low-income communities, mainly due to lower land acquisition costs, favourable zoning, tax incentives, and access to inexpensive electricity and water. However, these facilities typically offer limited long-term employment opportunities beyond the initial construction phase.¹²

In the US, local opposition to new datacentres has stalled \$64bn in projects, partly due to concerns about health risks.^{13,14} These issues are often worsened by poor community engagement, lack of transparency, higher energy prices and unequal environmental burdens, especially for disadvantaged communities. Solving these challenges will require a chain of efficiency improvements. For AI datacentres, this will help to cut costs, attract investment, reduce regulatory risk, and stay competitive in a resource-limited world.¹⁵



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³ [Spain's government blames huge blackout on grid regulator and private firms | BBC](#)

⁴ [Explainer: How China is managing the rising energy demand from data centres – Carbon Brief](#)

⁵ [EU Energy Efficiency Directive and its impact on Data Centres](#)

⁶ [Government Regulations and Sustainability Initiatives, energy consumption and carbon emissions](#)

⁷ [IndiaAI Mission \(2024\): Empowering Innovation, Infrastructure, & Inclusive Growth through AI | IMPRI](#)

⁸ [Singapore to free up 300MW for data centres](#)

⁹ [Water usage by AI data centers raises supply concerns and How We Use Water | US EPA](#)

Our stewardship approach

As AI and data infrastructure scale rapidly, their environmental and social impacts, particularly around energy, water, and land use, are becoming increasingly material to long-term investment outcomes. These risks can affect asset performance through regulation, resource scarcity, and reputational exposure. Engaging with these issues helps investors anticipate disruption, protect value, and support more resilient systems that benefit investment portfolios and the communities they touch.

Below, we have identified various actions that may be appropriate for different companies, which we aim to discuss when engaging with them.



Tech companies and datacentre operators

- To improve the opportunity for increased energy efficiency, which can help to cut costs, improve security of energy supply, and contribute to higher profit margins over time, consider measures such as adopting energy-saving AI chips and facilities, and forming partnerships, like that of Nvidia-Emerald AI. Where companies are leasing datacentre services, they should include efficiency expectations in tenders and contracts.
- For tech firms using natural gas-powered electricity supplies, they may seek to build or partner with operationally efficient facilities and energy supplies, including to avoid gas leaks (methane), which can help to improve the all-round financial performance and resilience of the asset.
- Seek to drive water efficiency, which can help to reduce costs and contribute to more profitable operations; for example by measuring and reporting water use efficiency (WUE) sources, quantifying water consumption per AI task, and accounting for indirect water use beyond cooling systems.

- Strengthen board oversight: align capital spending with utility asset lifecycles to avoid the risk of stranded or financially underperforming assets.
- Disclose broader datacentre risks: engage communities early, assess social and environmental impacts, and plan for circularity from build to decommissioning.



Utilities

- Companies should seek to disclose their infrastructure plans using verified demand data to prevent overbuilding. In the US, speculative requests outnumber actual builds by between five and 10 times.¹⁶
- Align infrastructure with community needs to prevent rising costs and energy affordability issues. Use flexible contracts and planning tools, such as cancellation clauses and staged commitments, to manage demand shifts and avoid the risk of stranded assets.
- Consider the opportunity to diversify energy supplies across a broad mix of sources, including new technologies such as renewables combined with battery storage, in order to improve the security of energy supply and reduce long-term costs.



Oil and gas infrastructure

- As some oil and gas companies reposition themselves as utility-like providers through off-grid power generation, maintaining strong capital discipline is essential to avoid a risk of asset stranding and low returns on the capital employed.
- Seek the business opportunity of reducing natural gas leaks in order to save costs and improve profitability when supplying energy to datacentre customers.

Engaging with companies

In 2024 and 2025, EOS deepened its engagement with energy and tech companies to address AI-driven power demand. In the US, we have spoken to utilities such as Dominion Energy about the business benefits of developing a broad energy mix, including renewables, battery storage, natural gas, and small modular reactors (SMRs), which combined, can reduce cost volatility and support customer reliability and affordability. In the UK, we have engaged with National Grid about how it manages AI-related congestion risks in the electricity grid, to smooth out future revenues and profitability.

We have also engaged with the oil and gas industry, including producers ExxonMobil, Chevron, and ConocoPhillips, infrastructure operator the Williams Company, and EQT.

In these discussions, we have highlighted the business benefits of ensuring strong capital discipline when developing new energy supply infrastructure, as well as the opportunity to reduce methane leakage, saving costs and improving profitability when supplying energy to datacentre projects.

We have spoken to technology companies such as Alphabet about how it is implementing supply chain best practices to help manage security of supply and business resilience as it grows its energy demands. This includes the opportunity to reduce costs in its supply chain through improved methane leak management.

In Asia, we have engaged with companies such as the Hong Kong Stock Exchange, which has been looking for ways to manage energy efficiency in its datacentres.

¹⁶ A fraction of proposed data centers will get built. Utilities are wising up. | Utility Dive

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