# Microgrids emerge as a sustainable solution for growing data centre energy demands



As the global data centre market is projected to grow by 30% and exceed a value of US$430 billion by 2028, energy consumption in this sector is becoming a pressing concern. TJ Surbella, Strategic Planning Director at AspenTech, highlighted that an increase in electricity demand, particularly from data-intensive applications like artificial intelligence (AI), will necessitate a robust energy strategy. The U.S. Energy Information Administration forecasts that global energy consumption will rise significantly through 2050, with data centres driving much of this growth.

An analysis from the Center for Advanced Manufacturing at Clemson University anticipates an annual surge in electricity demand of 10-12%, against a mere 2% growth in global electric generation capabilities. This stark discrepancy raises questions around the feasibility of powering the expanding number of data centres, particularly in light of sustainability targets that companies are now aiming to meet. To respond to these energy demands while promoting a lower carbon footprint, data centre operators are increasingly considering renewable energy resources such as solar, wind, and geothermal power.

One increasingly favoured solution is the implementation of microgrids. These self-sufficient energy systems can work either in conjunction with or independently of the main power grid, allowing data centres to generate and manage their power locally. Ron Beck, Senior Director at AspenTech, explained that microgrids enhance operational resilience by enabling facilities to react dynamically to grid disruptions, essentially allowing data centres to "island" themselves and continue functioning during outages. This feature becomes crucial as traditional grid systems contend with vulnerabilities stemming from climate events, ageing infrastructure, and geopolitical tensions.

The shift towards microgrids arises from the growing recognition that reliance on centralised grids is fraught with risk. In several European regions, for instance, electricity supply struggles to keep pace with surging demand, particularly with the integration of renewable energy sources that require significant logistical support to transmit power from generation sites to urban centres. As a result, many data centre operators are seeking alternative solutions to ensure energy security, citing increased operational risks amidst rising energy costs.

Microgrids offer a strategic path forward, allowing data centres to accelerate the deployment of new facilities and ensure consistent power supply, especially for critical AI computations. The ability to generate energy on-site reduces exposure to fluctuating grid prices and enables facilities to sell excess electricity back to the grid. In terms of operational management, data centres that utilise microgrids must balance their energy generation with fluctuating load demands, which can be achieved through sophisticated systems like supervisory control and data acquisition (SCADA) technology.

Advancements in AI are set to play a crucial role in optimising microgrid effectiveness. With the support of machine learning and predictive analytics, data centres can forecast energy demand and renewable energy availability, aiding in better energy management practices. These tools not only facilitate stored energy use during peak demand but can also contribute to overall grid stability.

The move toward microgrids is already being observed in various jurisdictions known for their progressive energy policies, including California, Western Australia, and Upstate New York, where the implementation of microgrids is being incentivised. As regulatory requirements concerning carbon emissions intensify, data centres equipped with microgrid systems will be well-positioned to comply with these evolving standards while managing their energy resources more flexibly.

With the inexorable rise in energy demand expected in the coming years, microgrids present a practical and forward-thinking solution. These systems not only fulfil operational requirements but also align with growing sustainability concerns. For data centres dedicated to reliable, efficient, and eco-friendly operations, the transition to microgrid technology is becoming an integral component of their energy strategy.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

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