

# UNLOCKING GLOBAL DATA CENTER GROWTH

THE RECENT BOOM IN GENERATIVE ARTIFICIAL INTELLIGENCE HAS RESULTED IN AN ARMS RACE TO DEVELOP THE TECHNOLOGY, WHICH WILL REQUIRE MANY HIGH-DENSITY DATA CENTERS AS WELL AS MUCH MORE ELECTRICITY TO POWER THEM. BY **SEBASTIEN BONNEAU**, LONDON, AND **CARL FLEMING**, WASHINGTON DC, PARTNERS AT **MCDERMOTT WILL & EMERY**.

This acceleration, and the convergence of two global megatrends – digitization and decarbonization – is creating vast opportunities for both data center and power project developers, especially those that can bridge the two worlds.

The global data center market is in serious need of power, and the traditional grid is not meeting this demand. Consequently, energy providers well-versed in the needs of data center developers are capitalizing on this opportunity by entering the market with a strong bargaining position, leading to the emergence of interesting new structures in both the US and Europe.

This article sets out our views on (i) a number of diverse power sources for data centers, (ii) how the most recent structures are marrying data centers with energy supply, (iii) emerging data center and energy financing trends, and (iv) the future of the market.

## Diversification of power essential

Except in extreme cases, power is still available but not necessarily where data centers are located, as they tend to have already consumed most of the available power in those areas. This situation leads to either a reversal of the traditional approach – “we need to find ways to bring power to our data center facility” – which is now sometimes flipped to “let’s build data centers where new power sources are and improve data connectivity to and from those new sites”, or to the decision to build onsite electricity generation as a complement to the grid, though rarely as a total substitute. This alternative option is known as behind-the-meter generation.

As the ability to deliver data center capacity quickly is crucial in this industry, data center owners and developers increasingly offer their tenants – most often large US tech companies, or “hyperscalers” – solutions to bridge the temporary lack of capacity. This gap exists between the current available power from the grid and the completion of a massive onsite generation plant, which can take at least two to three years.

To address this, they install alternative power sources to increase the site’s total capacity and provide backup power in case of grid supply deficiencies. Over the past 18 months, this bridging solution has generally involved the

installation of gas turbines. Once the onsite plant is built, the gas turbines ensure redundancy, transitioning from the primary power source to a backup role.

At full production capacity, a data center powered by onsite generation has the added advantage of selling surplus power back to the grid. This avoids a loss of production capacity and alleviates some of the financial pressure on the overall project.

## The impact of innovation

Ironically, AI will accelerate innovation and substantially affect how data centers are designed, powered, and connected to networks. This process has already begun, leading to a reshaping of data center projects over the past 24 months. All things being equal, square footage is becoming less important as servers become more performant. However, these servers require significantly more power and cooling to function, and their numbers have increased dramatically.

Regarding power, small modular nuclear reactors (SMRs) are expected to be operational and deployed across data centers within two to four years, though expert opinions vary. Similarly, solar and wind power generation is improving, and the use of hydrogen sources is being regularly tested.

While the need for compute capacity over the next decades does not appear to face significant challenges, the methods for delivering this capacity are expected to evolve substantially during this period. The industry is currently focusing on 2030 as a tipping point and strategic objective, but no one really knows how it will evolve after that date.

## Financing behind-the meter data centers

We see an increasing number of real estate developers and energy suppliers entering the sector. Powered land – or land with a timeline to power – in or near a cluster of existing data



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centers, which suggests great connectivity to the internet, is currently seen as the golden ticket.

The market is pursuing “powered shells”, on which data centers matching hyperscaler designs can be developed. These can either be rented – with an option to purchase – or purchased once built.

A similar logic is emerging for onsite power generation. Energy developers are buying large tracts of land, securing a connection to the grid, and building an initial onsite generation plant. This first move is generally financed through equity and followed by a series of debt financing.

Once the initial groundwork is in place, they seek equity partners to finance part of the construction of the data center buildings through a joint venture (effectively, a ground lessee). The remainder of the data center development is financed through debt at the joint venture level, with lenders secured by a series of SNDAs, enforcement rights, and ultimately, the lease secured with the anchor tenant hyperscaler. Given the risk that the overall power capacity may not be fully delivered at this stage, some projects rely on additional mezzanine financing.

The final step for the ground lessor (the energy company that initiated the project) is to secure additional funding to complete the project from an energy perspective and build the massive onsite generation plant. As explained above, this plant will not only ensure a reliable primary power source for the existing buildings but will also attract new customers to the campus, who may request the construction of additional data center buildings powered by the plant.

#### **The markets continue to evolve**

The current global market capacity of data centers is approximately 59GW and Goldman Sachs Research estimates that there will be around 122GW of data center capacity online by the end of 2030.<sup>1</sup>

The US currently represents approximately 60% of such globally installed data center capacity. Taking into consideration the base of currently installed data centers and those expected to come online in light of public announcements, BCG’s model estimates that the US will account for the majority of data center power demand growth from 2023 to 2028.<sup>2</sup>

This expansion in the US will be concentrated in specific electricity market regions. We agree with BCG’s projections that about 70% of the installed base for US data centers will be located in the PJM Interconnection, which includes Virginia and Ohio; the Midcontinent Independent

System Operator; which includes Illinois and Iowa; the Northwest, including Oregon; and the Southeast, including Georgia, in 2028.<sup>3</sup>

The US’s dominance in the data center landscape reflects factors such as major hyperscalers’ headquarters in the country, access to reliable energy, strong connectivity, a country risk profile that is low overall, and a favorable regulatory environment. For hyperscalers with ambitious climate goals, the accessibility of large-scale renewable energy and the widespread adoption of mechanisms such as power purchase agreements (PPAs) have further supported data center development in the US.<sup>4</sup>

We also concur with BCG’s projections based on current and planned data centers showing that locations outside the US will capture the remaining 30% of total growth during the period from 2023 to 2028, owing largely to three factors: data security and sovereignty; increasing options for access to reliable and low cost power; and the expansion of AI without latency requirements.

#### **Conclusion**

In conclusion, the recent boom in generative artificial intelligence has sparked an arms race to develop the technology, necessitating the construction of numerous high-density data centers and significantly increasing electricity demands. This rapid acceleration, coupled with the convergence of two global megatrends - digitization and decarbonization - presents vast opportunities for both data center and power project developers, particularly those capable of bridging these two domains.

The global data center market is experiencing a critical need for power, and the traditional grid is struggling to meet this demand. As a result, energy providers that understand the specific requirements of data center developers are seizing this opportunity, entering the market with a strong bargaining position. This dynamic is leading to the emergence of innovative new structures in both the US and Europe.

This article has explored our perspectives on several key areas: the diverse power sources available for data centers, the latest structures that integrate data centers with energy supply, emerging trends in data center and energy financing, and the future outlook for the market. As the industry continues to evolve, those who can adeptly navigate and capitalize on these trends will be well-positioned to lead the way in this transformative era. ■

#### **Footnotes**

1 - <https://www.goldmansachs.com/insights/articles/ai-to-drive-165-increase-in-data-center-power-demand-by-2030>

2 - <https://www.bcg.com/publications/2025/breaking-barriers-data-center-growth>

3 - <https://www.bcg.com/publications/2025/breaking-barriers-data-center-growth>

4 - <https://www.bcg.com/publications/2025/breaking-barriers-data-center-growth>



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