# At the Intersection of Data Centers, Power and Private Equity

Updated 2.26.2024

The explosive demand for data center capacity and the power to run it is creating major investment and development opportunities, private equity will play a key role.

## The Situation

Available data center capacity in the U.S. is constrained. Average vacancy rates in North America decreased from an already low 3.2% to 2.7% in the second half of 2023. datacenterHawk

Growing demand for data center capacity, typically measured in megawatts (MW), increasingly in gigawatts (GW), is being driven in large part by the adoption of artificial intelligence (AI) tools. The AI infrastructure market, including data centers, networks and hardware is expected to reach $422.55 billion by 2029, growing at a compound annual rate of 44% over the next several years. Wall Street Journal Power demand from AI implementation alone is projected to grow from ~ 18 gigawatts (GW) in 2023 to ~ 35 GW by 2030. McKinsey & Company.

Open AI's CEO Sam Altman said at the World Economic Forum annual meeting in January "*…an energy breakthrough is necessary for future artificial intelligence, which will consume vastly more power than people have expected.*" U.S. News & World Report Altman mentions both fusion and fission nuclear energy as possible solutions.

At the same time, generation resources and power grids are severely strained in some U.S. markets, and there are 85 gigawatts of power plant retirements scheduled in the U.S. over the next ten years. New generation resources and transmission infrastructure can take years to bring into service. For hyperscale data center and megacampus developments the choices are: 1) Find existing available power and transmission capacity, or 2) BYOP – Bring Your Own Power and/or transmission. BisNow The right choice for a given project will depend to a large degree on the target timeline.

## The Solution(s)

The power supply goal for mission critical data centers is the four R's: Robust, Resilient, Reasonably priced; and Renewable energy options. In some markets these can be achieved with existing generation and transmission. Other markets will require development of new generation assets and transmission infrastructure.

### Existing Power and Transmission

Identify utilities that have adequate power to serve the hyperscale data center's target capacity. The data center may be constructed in phases – for example, five stages of 50 MW each over five years for a 250 MW facility. Incremental power demand over a period of years can help the relevant utility to plan and supply power. At a high level, look for power supply with the following attributes:

- A balanced generation fleet, including baseload and peaking power
- New generation projects underway and/or well advanced
- Substantial fast ramping generation and energy storage
- Underutilized existing generation assets
- Stable local and regional transmission systems
- New transmission projects underway and/or well advanced
- Natural gas pipelines with available capacity and ability to expand

### New Generation and Transmission

As a practical matter, adequate existing power and/or transmission may not be available in the target location for a given data center or campus, so it must be developed. Hyperscale data center operators participating directly in their power supply have primarily done so using power purchase agreements (PPAs) with third party power producers, in cooperation with their local utility.

Generation owned by the data center operator – located onsite, in close proximity or in the same transmission system is gaining some traction. The approach is appealing for reasons including reduced or no transmission risk, potential for lower average annual power cost, improved energy security and flexibility and advancement of lower carbon energy goals.

In recent years most of the new generation developed in the U.S. for use by data centers has been solar or wind power, which is consistent with the lower carbon goals of most major operators. Solar and wind generation projects will continue to comprise the bulk of new power projects aligned with data centers for some years to come. Since wind and solar are intermittent resources and most data centers need power around the clock 365 days a year these energy sources standalone won't suffice.

Energy storage and backup generation are partial solutions, but most data centers and campuses planning to develop their own renewable power will be best served by employing a hybrid approach that includes interconnection to the grid. Access to power from the grid enhances supply security and flexibility; and provides access to multiple sources of intrastate and interstate power - including from renewable energy. This hybrid power supply approach will increasingly employ microgrids. Deloitte

## On the Power Frontier

Microgrids aren't new, but they will see more deployment at large scale in various configurations in the years to come. For mission critical hyperscale data centers and megacampuses, a microgrid can enable aggregating/incorporating different types of generation and storage components onsite or in close proximity for example: renewable (solar or wind), battery energy storage, natural gas turbines or fuel cells and bidirectional interconnections to the grid.

Hybrid power supply systems will help ensure security and flexibility, source options and at scale they can also enable negative price capture for cost averaging and arbitrage opportunities. Deloitte  U.S. DOE

Since microgrids can serve multiple users, they lend themselves to cost sharing and configuration optimization. Also, depending on a couple factors, cost recovery may be available from an interconnected utility and microgrids are supported by provisions in the Inflation Reduction Act (IRA). Power Secure

There are generation and energy storage technologies on the power frontier that merit consideration going forward, including: enhanced geothermal energy, small modular reactor (SMR) nuclear energy, long-duration battery energy storage and hydrogen (in various "colors" including gre  en). Emerging technologies and other power and transmission points are discussed in some detail in a related article: *Siting Hyperscale Data Centers & MegaCampuses for Artificial Intelligence Power Demand*

## Key Takeaway

Hyperscale data center and megacampus developers in power constrained U.S. markets should **plan to be a meaningful part of the power supply solution**, versus part of the power demand problem.

# Private Equity Opportunities

## Appealing Investments

Private equity firms invest extensively in both data centers and power infrastructure. Investors like data center and power investments for their steady, low risk cash flows, attractive risk-adjusted yield rates, scale and the sector's trend. McKinsey & Company

Attributes common to hyperscale data center and power investments:

- Creditworthy, sophisticated counterparties
- Long-term contracts
- Stable, sustainable income
- Less volatility and interest rate sensitivity
- Assets are well accepted in secondary markets

## Capital Deployment

Hyperscale data centers can require capital expenditures from hundreds of millions of dollars to over a billion dollars. Individual utility scale natural gas, solar and wind projects can also run to the hundreds of millions of dollars, as can transmission projects. Capital deployments may be in tranches for phased projects.

## Long-term Uptrend

The demand for data center capacity, power generation and new transmission projects in the U.S. is substantial. Speaking at BlackRock's fourth quarter earnings call in January of this year, Chairman and CEO Larry Fink said infrastructure will be one of the fastest growing sectors of private markets for years to come. Among the trends driving this growth, Fink listed increasing global demand for digital infrastructure, the need to upgrade logistical hubs and reconfigure existing supply chains and moves toward decarbonization and energy independence.

"Having a long duration, high coupon, inflation-protected asset is a very strong asset class for all the retirement funds, but importantly… wealth," he said. "We believe [it's] a great opportunity to provide to the wealth management market these types of products, so they can enjoy these type of long duration assets." Wealth Management

## Empowering Projects at Ground Level

The siting landscape for hyperscale data centers and power projects is dynamic. Local and regional infrastructure projects including conventional and renewable generation, transmission lines, natural gas pipelines and long-haul fiber optic lines in stages from conceptual to under construction can be found in some markets.

Viable sites with the requisite critical attributes enable combinations of hyperscale data centers, power projects and private equity investments to materialize. Sites that offer competitive advantages in terms of total capital expenditure; timeline to commercial operation; and total operating costs can mean the difference between a project's success and failure.

While land costs are typically a small fraction of the capital required to build out data centers and power projects, the site selection function is critical. There are existing and emerging opportunities at major scale.

**Strategic Siting™** Trey Champie connects market participants and sites large scale, mission critical projects on both the supply and demand sides of the power grid. Email: champie@headquarterswest.com  Cell: 520-235-3577

#DataCenter #Power #PrivateEquity #Investment #RealEstate

Power supply and backup power supply points are discussed in more detail in related article: *Siting Hyperscale Data Centers & Megacampuses for AI Power Demand*