

The great convergence: how AI power demand is driving vertical integration across digital, power generation and grid infrastructure

Key takeaways

- **Vertical integration has become the dominant strategic response to AI-driven power demand:** Companies across utilities, hyperscalers, and private capital are collapsing the traditional boundaries between technology, power generation, and infrastructure
- **The PPA model is evolving as data center players move deeper into the power space:** The traditional power purchase agreement, while still a fixture of clean energy strategy, is no longer sufficient on its own for the most ambitious AI infrastructure buildout



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How data centers are driving a new era of vertical integration^{1,2,3,4,5,6}

AI-driven data center demand is redrawing the boundaries between technology, power generation, and infrastructure investment, with vertical integration emerging as the defining strategic response. Companies that once operated as customers, suppliers, or financiers in separate silos are now collapsing those distinctions through ownership. With data centers projected to drive 46% of all new U.S. electricity load growth through 2030 and the U.S. fleet expected to nearly double from 31 GW in 2023 to roughly 56.5 GW by 2026, the gap between compute ambition and grid reality is forcing a fundamental restructuring of how power and technology firms relate to one another.

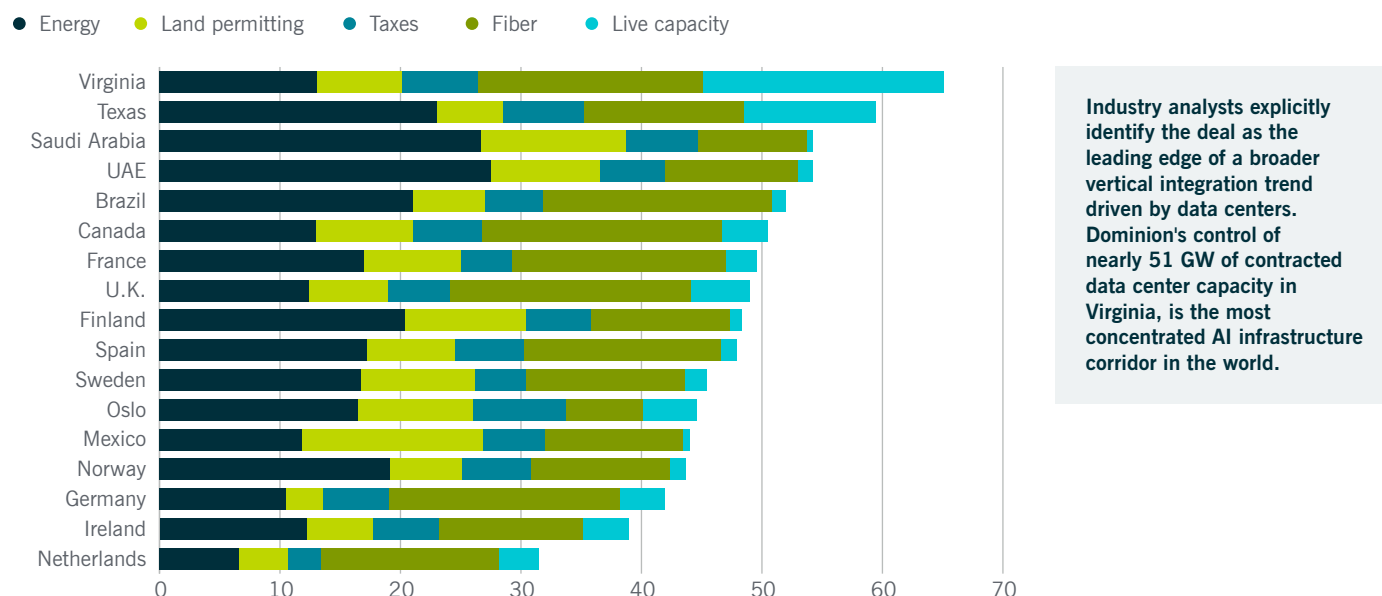
NextEra, Google, and the race to own the power behind AI

The NextEra-Dominion merger represents vertical integration through utility consolidation at a scale explicitly designed to match hyperscaler power demands. The proposed tie-up will create a customer serving utility and power generation company with \$420 billion in enterprise value — with more than 10 million customers across Florida, Virginia, and the Carolinas, and

110 GW of generation from natural gas, nuclear, wind, and solar. Dominion is the primary power supplier for “Data Center Alley” in northern Virginia — the heartland of U.S. AI infrastructure handling roughly two-thirds of global internet traffic—and the combined company would carry 130 GW of “large-load requests” in its pipeline. NextEra CEO John Ketchum framed the merger as a response to a “historic moment” when “electricity demand is rising faster than it has in decades” and “scale matters more than ever.”

Google’s \$4.75 billion acquisition of Intersect Power demonstrates vertical integration moving in the opposite direction, with hyperscalers pushing downstream into power development. Closed in March 2026, the deal signals what one analysis describes as the terminal phase of the PPA era. Rather than signing 30-year PPAs to claim renewable credits at arm’s length, Google absorbed Intersect’s development platform to gain direct control over a 10.8 GW pipeline, secure access to constrained components, and develop co-located power and data center architectures. The strategic objective is no longer the lowest cost of energy but “speed to power” — Phase 1 of Google’s first Energy Park achieved an 18-month construction-to-operation timeline using 500 MW of behind-the-meter solar and 2 GWh of battery storage, bypassing a five-year PJM interconnection queue entirely.

Figure 1: Best place to develop data centers according to BloombergNEF (score)⁷



Source: BloombergNEF. (2026, January 30). Data Center Development: Regional Drivers and Hurdles, Accompanying Charts. Bloomberg Finance L.P.

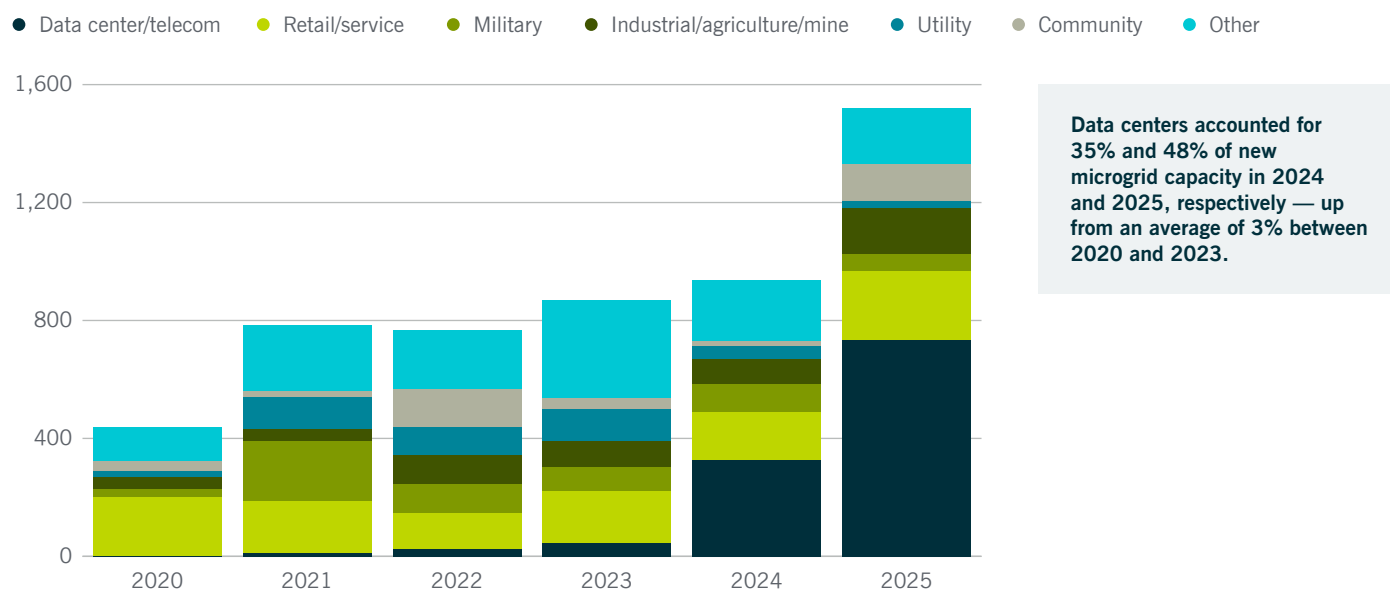
Two development disciplines, one platform: DigitalBridge and ArcLight unite digital infrastructure and power

The DigitalBridge-ArcLight combination represents the natural progression of private capital into the power sector, now more sharply targeted toward data center demand upside and strategic asset development. Earlier deals established the template. Blackstone’s \$11.5 billion acquisition of TXNM Energy and the joint GIP/EQT \$33.4 billion takeover of AES saw financial sponsors acquiring utility platforms at a moment when AI-driven load growth is making power infrastructure strategically valuable well beyond what regulated earnings profiles alone would suggest. The DigitalBridge-ArcLight transaction, announced in May 2026 at \$1.05 billion, advances that thesis into explicit vertical integration — a digital infrastructure platform combining with a power specialist that has owned or operated more than 70 GW of generation and 48,000 miles of transmission. The result is a platform managing over \$150 billion in assets at “the convergence

of power, AI, and digital infrastructure,” with the mandate to develop and own both together. As ArcLight’s managing partner, Daniel Revers, put it: “Power has become the critical bottleneck for digital infrastructure buildout and solving it takes expertise and dedicated people.”

The limitations of the PPA model have become increasingly apparent in an environment of grid constraints that vertical integration is uniquely positioned to address. Lawrence Berkeley National Laboratory data shows 2.3 terawatts of capacity stuck in interconnection queues with median wait times exceeding four years, and only 13% of queued projects ever reaching commercial operation. Echoing this reality, Google’s former global head of energy, Caroline Golin, was direct: “any developer going to the market trying to sell 30-year PPAs that look like the same thing we were buying in 2021 have sort of missed the alarm clock.” Today, power capacity has become more valuable than power itself — the grid-ready ability to draw electricity where and when it is needed, which vertical integration unlocks.

Figure 2: Microgrid capacity additions across customer subsectors (MW)



Source: Wood Mackenzie

Speed to power: how U.S. data centers are bringing their own generation to bypass the grid bottleneck^{8,9,10}

On-Site Gas Emerges as the Bridge Solution to Grid Bottlenecks

There is an estimated 114GW global pipeline of on-site gas capacity tied to data centers, which is over half the size of the entire U.S. data center pipeline. As grid-connection delays stretch into the 2030s, data center developers are increasingly favoring on-site, gas-fired generation over waiting for the utility. Nearly 90% of that capacity (about 100GW) targets the U.S., equivalent to 52% of U.S. data center IT capacity as of 3Q 2025. Demand growth underpins the urgency to build on-site power. U.S. data center power demand is forecast to reach roughly 106GW by 2035, tripling within a decade.

The driver is timing rather than economics, utility-scale gas plants can take seven years to connect and several utilities have said they cannot connect new applicants until after 2030, behind-the-meter gas can come online far faster. Most developers still intend to secure a grid connection eventually, viewing on-site gas as a “bridge solution” to bypass long lead times, with equipment retained afterward as backup or for grid export. By 2030, the PJM forecast exceeds the effective carrying capacity from new supply by almost 10GW. Notably, only

about 2GW of on-site gas is operating today, with 7.5GW under construction — meaning much of the pipeline is a bet on a bullish buildout scenario.

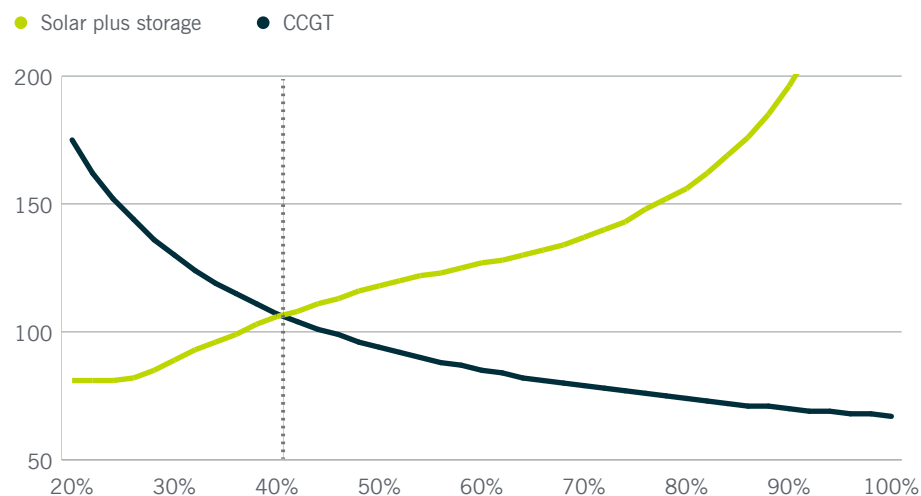
Gas turbines dominate the technology mix, despite long lead times

Gas turbines have become the technology of choice, accounting for nearly 70% of the tracked pipeline on a capacity basis. Heavy-duty turbines hold the largest share at 27.2GW, with industrial, light-industrial and aeroderivative turbines comprising a further 14.6GW. Engines make up 18.3GW (mainly high-speed units), while fuel cells remain niche at 0.6%. Developers building gigawatt-scale campuses prefer turbines because reaching that scale with engines or fuel cells would require far more units, increasing footprint, interconnection complexity, and maintenance.

Manufacturers including GE Vernova and Siemens Energy report limited turbine availability until 2029, with heavy-duty lead times extending as long as seven years. Engines are faster at roughly two years, and fuel cells can reportedly deploy in 90 days — prompting an uptick in engine announcements since 2H 2025. GE Vernova leads suppliers at 19.6GW of contracted capacity, followed by Siemens Energy (4.5GW), with INNIO Jenbacher (9.1GW) leading on the engine side.

Figure 3: Levelized cost of off-grid power as a function of data center demand met in PJM

\$ per megawatt-hour



Source: BloombergNEF

Data centers often cannot secure a grid interconnect that meets all their power needs, so they must turn to a distributed generation solution.

Currently, the cost tipping point is 40% when comparing to two primary distributed generation solutions, solar plus storage and gas-fired turbines.

If a data center needs less than 40% of its power from an on-site source, solar plus storage is more economical; if it needs more than 40%, a gas turbine is cheaper.

Battery storage shifts from niche to critical

The AI investment boom is driving battery energy storage systems (BESS) into several new applications beyond their traditional role as uninterruptible power supplies, creating a U.S. total addressable market approaching 20GWh a year. Microgrid research likewise finds BESS “shifting from niche to critical”, and the two findings connect directly: developers indicated storage is an essential part of on-site gas systems, typically deployed at a ratio of roughly 1MW of storage per 2MW of generation, at two-hour duration.

BESS serves three overlapping functions:

1. **Supporting microgrids:** Smoothing and storing solar panel output, reducing mechanical wear on turbines and engines from volatile loads, improving plant efficiency by letting generators run at optimal load and negating the need to run redundant units, and providing grid-forming capability to anchor the microgrid.
2. **Power quality control:** AI GPU workloads can swing 83% in 20 milliseconds, and at scale this produces power swings of hundreds of megawatts that can damage upstream equipment — BESS smooths these fluctuations.

3. **Expediting grid connections:** A Camus Energy and Princeton study found data centers can connect three to five years faster by relying on batteries and generators for extreme peak hours (40–70 hours per year)

Emerging technologies and the road ahead

Beyond turbines and batteries, a longer-term technology landscape is taking shape. Fuel cells (led by Bloom Energy on solid-oxide), linear generators (Mainspring Energy), and post-combustion carbon capture and oxy-combustion systems (8 Rivers, NET Power, Babcock & Wilcox) are drawing interest from operators seeking cleaner deployment options, though Carbon Capture and Storage (CCS) faces the persistent challenge of transporting and storing captured CO₂ away from data center hubs. On the microgrid side, long-duration energy storage (LDES), small modular reactors (SMRs), and geothermal are emerging as new asset classes — though LDES has yet to scale (most deployments sit at \$150–250/MWh against the DOE’s \$50/MWh target) and SMR commercialization remains years away despite accelerating permitting.

Responsible investing considerations: why the convergence raises the stakes on environmental due diligence

For AI infrastructure, environmental, social and governance performance has become inseparable from financial performance. Energy, water, and community considerations can materially impact a project's cost, its permitting timeline, and its terminal value. The speed-to-power strategies driving today's deals — behind-the-meter gas, co-located generation, and grid bypass — are precisely the choices carrying the heaviest energy, water, and community consequences. Weak oversight of these factors is no longer a reporting gap; it is a potentially direct threat to the cash flows and asset value underpinning the buildout.

As the PPA era gives way to owned generation, the credibility test shifts from claiming renewable credits to demonstrating that new load is matched with genuinely new, local, carbon-free supply.

Accessing clean energy already on the grid is not enough; significant incremental load will raise fossil emissions unless paired with additional clean energy generation. Investors should look beyond market-based instruments — PPAs, unbundled RECs, and EACs — to assess time- and location-matched performance. This scrutiny matters more, not less, in a behind-the-meter world, where the “bring your own clean energy” model can simultaneously ease affordability and reputational exposure in avoiding straining the local grid and driving up power prices for ratepayers. With gas turbines now dominating this bridge-solution buildout, investors should also treat equipment selection during this interim phase as a distinct point of diligence, favoring lower-emission turbine designs and manufacturer performance guarantees on emissions output. This allows the sector's speed-to-power priorities to advance without losing sight of environmental impact ahead of an eventual transition to grid power and, ideally, additional clean generation.

Roughly 40% of existing and planned U.S. data center capacity sits in areas of high or extremely high water stress, and the generation behind that load carries an even larger indirect water footprint. Thermoelectric generation accounts for over 30% of U.S. freshwater withdrawals, so the gas-fired and co-located strategies driving the convergence also amplify water exposure. In stressed basins this can materialize abruptly as higher costs and withdrawal restrictions. In stressed basins, this can materialize abruptly as higher costs and withdrawal restrictions. Because most disclosures emphasize efficiency ratios rather than absolute, basin-level withdrawals, investors should probe absolute water use, sourcing, and drought resilience at the facility and basin level.¹¹

Community opposition has moved from a reputational footnote to a material determinant of whether projects reach commercial operation. Per Data Center Watch, 20 projects representing an estimated \$98 billion across 11 states were delayed or halted in 2Q25, often due to local opposition or incentive pullbacks. New substations, transmission lines, on-site generation, and backup diesel reshape host communities even as the economic benefits accrue broadly. Ratepayer cross-subsidization is a parallel political risk: where utilities recover data center-driven capital across the broader rate base, rising household bills can trigger regulatory intervention affecting cost recovery.

Please read [Decoding data centers: Sustainability due diligence across the value chain](#) for a more in-depth analysis regarding the responsible investing consideration impacting the building and operations of data centers for AI.

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Endnotes

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