

A.I. IS RESHAPING DATA CENTER POWER. WHAT ROLE CAN RENTAL POWER PLAY?

FROM GROUNDBREAKING TO GRID CONNECTION WITH CAT® RENTAL POWER

ABSTRACT

Artificial intelligence (AI) is changing the pace and scale of data center development, and with it, the way the energy industry is thinking about power. As AI workloads grow, facilities are becoming more power-dense, more dynamic, and more time-sensitive, putting pressure on developers, utilities, and energy providers to plan differently. This paper explores what is driving that shift, where infrastructure bottlenecks are starting to show up, and why temporary power is becoming part of a more flexible strategy for keeping projects moving when permanent power isn't ready or available.

WHY AI IS CHANGING DATA CENTER POWER PLANNING

1. AI workloads are changing the energy profile of data centers

One of the biggest reasons power requirements are rising is AI itself. Compared with traditional applications, AI training and inference demand more computing intensity, which means more energy packed into each rack and more continuous load across the facility. These are not just bigger data centers. They are more power-dense data centers, and that changes how sites need to be planned, powered, and cooled.

2. Digital demand is still growing, even beyond AI

AI may be getting most of the attention, but it is not the only reason demand is rising. Cloud computing, streaming, connected devices, and ongoing digital transformation are all adding to the need for more processing and storage capacity. The result is steady expansion across the data center industry, with more sites being built and many of them growing to hyperscale.

3. Power demand is rising faster than infrastructure can keep up

Data center projects are moving quickly, but the infrastructure needed to power them is not always keeping pace. Utility interconnections, substation work, permitting, equipment lead times, and transmission upgrades can all delay when permanent power becomes available. At the same time, overall electricity demand from data centers are rising, putting more pressure on generation, transmission, and distribution systems. Global data center electricity consumption reached about 460 terawatt-hours in 2022 and is projected to exceed 1,000 terawatt-hours by the end of 2026. The result is a power gap: a period when a project is ready to move forward, but long-term power is not fully in place yet.

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To address this challenge, many organizations are incorporating temporary power into their broader power strategy, using it to support peak demand, supplement grid capacity, and provide the flexibility needed while long-term infrastructure catches up. In some cases, what begins as a temporary solution can become part of a longer-term power plan.

WHAT THIS GROWTH MEANS FOR POWER STRATEGY

- Utility delays that can stretch across years
- Permitting complexity across multiple projects
- Grid constraints in areas with concentrated growth
- Supply chain issues that affect equipment and schedules

Together, these bottlenecks create a gap between project timelines and power availability. For developers and operators, that can mean delays, added risk, and fewer options for keeping work on track.

Data centers require continuous, uninterrupted power, yet in many regions, utility supply cannot be delivered within the required project timelines. This creates a critical window of opportunity for alternative power solutions that can be deployed quickly and scaled as needed to support.

HOW FLEXIBLE POWER FITS INTO THE DATA CENTER LIFECYCLE

Rental power is well positioned to help address the challenges created by rising energy demand and delayed utility availability. Rather than serving only as an emergency option, it can support projects across multiple phases of the data center lifecycle.

1. Supporting Data Center Construction

In many cases, grid power is not available at the early stages of development. Rental power can help developers begin work earlier, support temporary site needs, and keep construction moving while utility connections are still pending. Whether the need is short term or extends over a longer period, rental solutions can be designed to match the site's power requirements.

2. Supporting Temporary Power During Permitting Delays

Permitting and utility delays can stall momentum and introduce real financial risk. Rental power can help teams maintain progress during that window by supporting testing, commissioning, validation, and other critical activities that keep a project moving forward. It also helps mitigate these challenges by:

- Maintaining progress during regulatory delays
- Supporting testing, commissioning, and system validation
- Reducing costly downtime and idle resources

Depending on the need, these solutions can support sites for weeks, months, or longer. The value is not only speed of deployment, but also the flexibility to adapt as load requirements change across the life of the project.

3. Bridging to Utility Power – Why Early Planning Matters

Bridge power solutions help fill the gap between project readiness and utility availability. They can be deployed relatively quickly and scaled to support commissioning, early operations, or a portion of the sites load while permanent power is still pending.

The earlier temporary power is considered, the more options teams typically have. Bringing rental power into the conversation early can help reduce schedule risk, support smoother commissioning, and create a more flexible path from construction to long-term operations.

WHY TEMPORARY POWER CAN INFORM LONG-TERM DECISIONS

Temporary power can do more than keep a project moving in the short term. It can also help teams understand what a site needs over time by supporting the work around construction, infrastructure upgrades, and early operations. That makes it useful not only as a stopgap, but also as a practical way to plan more effectively for long-term power needs.

This can include support for grid and utility upgrades, substation and transmission work, remote site development, and the temporary services needed to keep work on track. For example, temporary power may also be used to support:

- Heating and cooling systems
- Environmental control
- Lighting and temporary infrastructure
- Pumping and water management
- Compressed air and auxiliary systems

BUILDING A MORE ADAPTABLE POWER APPROACH

No two sites are exactly alike. Power strategies often need to reflect project timelines, site conditions, emissions requirements, fuel access, and long-term operating goals. That is why flexibility matters. Depending on the application, that can mean diesel generators for fast deployment, natural gas solutions for longer-duration operation, battery storage for load support, or microgrid-style configurations that combine technologies into a more resilient system.

WHY EXECUTION STILL MATTERS

- End-to-end support across planning, setup, and operation
- Site-specific solutions tailored to the project and load requirements
- Monitoring and service to help maintain performance and uptime
- Ongoing technical expertise as site needs change

In practice, that support can include system design, site layout, installation, commissioning, fuel planning, maintenance, and monitoring. The value is not just access to power equipment. It is access to the expertise needed to reduce complexity and keep projects moving from early development through ongoing operations.

SUMMARY

AI is accelerating the growth of data centers and changing the conversation around power. For the energy industry, the challenge is no longer only about meeting future demand. It is also about finding practical ways to support projects now, especially when utility readiness and project timelines do not fully align. Rental power doesn't replace permanent infrastructure, but it can help close the gap between power demand and power availability. Used strategically, it gives developers and operators more flexibility to keep work moving, manage risk, and build with greater confidence as data center needs continue to change.

