

Power Guide for Data Centers

An at-a-glance guide to on-site and grid-connected power strategies.

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This guide outlines the power options data center developers are actively evaluating. The goal is to clarify what's practical, what's conditional, and what requires long-range planning. Developers already know:

Power is the gating issue.

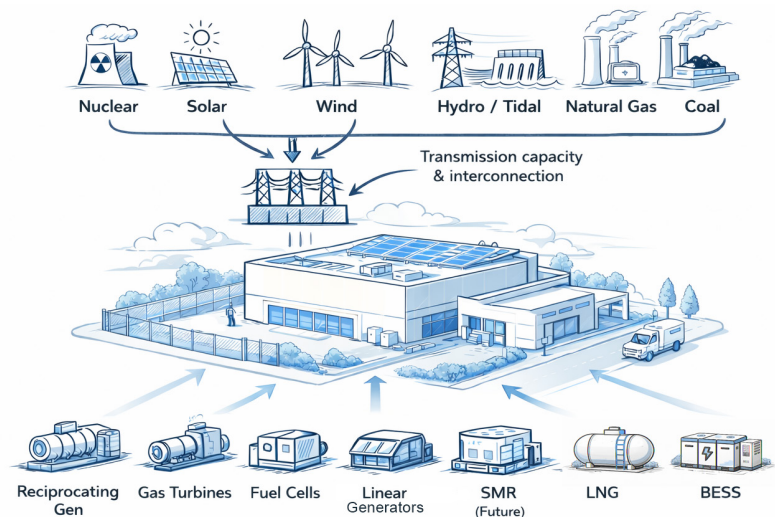
The question is how projects move forward inside those constraints. Strategies fall into two broad categories: 1) generation that can be colocated with the data center; and 2) power delivered through the grid.

Selection of on-site power generation sources or grid connectivity bring different implications for schedule, capital planning, operational control, emissions, and long-term flexibility.

Some options are available now while others are emerging and being deployed based on geography, utility posture, and regulatory context.


Power strategy shapes not only schedule, but the life of the facility.

Colocated and grid-delivered power solutions



Power decisions are system decisions.

There is no single right answer for data center power; this comparison explores the practical advantages and constraints of each option to support layered and evolving approaches.

SOURCE	TYPICAL ROLE IN HOSPITALS	CLINICAL RELIABILITY	CARBON PROFILE	KEY ADVANTAGES	KEY CONSTRAINTS
 DIESEL GENERATORS	Code-required emergency power	Very high	↑	Universally accepted proven technology	Fuel logistics; air quality; maintenance burden
 NATURAL GAS reciprocating generators	Backup or supplemental power	High	↑	No onsite fuel storage; fast start	Emissions, fuel dependency, & maintenance cycle
 FUEL CELLS natural gas	Baseload resilience; critical support	High	Reduced	Scalable, quiet, high efficiency output	Fuel supply dependency & carbon-emitting
 FUEL CELLS hydrogen	On-site low-carbon where fuel is available	High	↓	Zero local emissions	Fuel availability; infrastructure maturity
 BESS battery energy storage	Ride-through and transition stability	High (short duration)	↓	Instant response; protects clinical continuity	Limited duration; safety planning
 SOLAR photovoltaic	Supplemental	Low alone	↓	Reduces grid reliance	Intermittency & placement requirements
 WIND TURBINES small	Supplemental	Low alone	↓	Onsite renewable generation	Intermittency; siting constraints; noise
 CHP combined heat & power	Resilience; thermal energy	High	Reduced	Continuous operation; steam / hot water	Capital cost; thermal load dependence
 GEOTHERMAL	Niche baseload or supplemental power	High (where viable)	↓	Stable output; fit for campus district energy	Limited geographic & capital feasibility
 NUCLEAR SMR	Future on-site baseload option	Designed for continuous operation	↓	Reliable power with minimal carbon	Likely not commercially available until 2035



How hyperscalers evaluate power strategy early

At hyperscale, power decisions shape portfolio velocity and capital deployment. The question is which tradeoffs remain acceptable when repeated across dozens of sites.

WHAT DRIVES THE DECISION

Time to capacity dominates. The ability to deliver large, predictable load blocks on schedule outweighs most other variables, especially when paired with solutions that can be replicated across regions without introducing operational variance.

WHERE PROGRAMS BREAK DOWN

Risk concentrates when portfolios depend on future transmission upgrades, overestimate the scalability of emerging technologies, or defer power decisions too late in site sequencing. Each of these introduces friction that compounds across markets rather than remaining isolated to a single project.

WHAT WORKS AT SCALE

Successful programs screen sites by viable power pathways, plan for phased power models that preserve long-term optionality, and manage risk at the portfolio level to avoid shared dependencies that can stall multiple sites at once.

How Salas O'Brien can help

We can help enterprise clients, developers, and hyperscalers find the right mix of power strategies for their context and make a plan for speed to market or transitions over time.

For more information, reach out:

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