

Insights

THE ENERGY NEXUS: STRUCTURING INTEGRATED POWER AND DATA CENTRE INFRASTRUCTURE

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The data centre industry faces a defining challenge: securing reliable, resilient and cost-effective power at unprecedented scale. As artificial intelligence (AI) and high-performance computing drive demand into the hundreds of megawatts per campus – comparable to a small city – developers can no longer rely on legacy grid infrastructure built for a different era.

This constraint is reshaping the sector. Data centres are no longer just assets; they are becoming integrated energy platforms. The market is moving towards an Energy Nexus model, where data centres directly connect – physically and contractually – to dedicated, co-located power generation and storage. This shift marks the next phase of development, with significant implications for how projects are structured, financed and operated.

The scale of what is coming makes this imperative urgent. Roughly 100GW of data centre capacity is expected to come online between 2026 and 2030, with construction costs per MW rising as the complexity and requirements of customer equipment increase. Capacity is expanding toward gigawatt-scale facilities with rack densities exceeding 600 kilowatts – a step change that puts power supply, not floorspace, at the heart of every development decision.

Delivering these projects requires a more sophisticated approach to legal and commercial structuring. Developers and investors must align energy and digital infrastructure strategies from the outset – whether co-locating with renewables, integrating large-scale storage or planning for future power sources. Success depends on managing complexity across planning, regulation, financing and long-term operations in a coordinated way.

THE COMMERCIAL RATIONALE FOR THE ENERGY NEXUS

The move towards co-located power is driven by clear commercial, financial and ESG priorities. For developers and investors, direct control of the power supply is becoming essential to reduce risk and create long-term, sustainable value.

This can be achieved in four ways:

1. **De-risking power procurement and achieving cost certainty.** Power represents both the largest operating cost and the greatest source of volatility for data centres. Exposure to wholesale markets and regulated grid changes – particularly for network and balancing costs – creates long-term uncertainty. By connecting to dedicated, on-site or nearby generation through a private wire, operators can bypass much of this cost stack. Long-term private wire purchase agreements (PPAs) offer predictable pricing over 15–25 years, providing a level of certainty that conventional supply agreements cannot match.
2. **Solving the grid connection bottleneck.** Grid access has become a primary constraint on new development, with timelines often stretching over several years in many markets. Generating power behind the meter reduces reliance on the grid and lowers net import requirements, which can materially improve the feasibility of a connection. Although grid access remains necessary for resilience, projects that combine on-site generation with reduced demand profiles are often better positioned to navigate connection processes and associated costs.
3. **Delivering genuine, 24/7 sustainability.** Investor and tenant expectations have moved beyond offset-based approaches. The focus is now on demonstrating real-time, carbon-free energy use through temporal matching. Co-locating renewable generation with a large-scale Battery Energy Storage System (BESS) is the only credible way to achieve this. The BESS can store excess renewable energy generated during periods of high output and discharge it during periods when the renewable source is unavailable, smoothing intermittency. This model allows facilities to operate on a consistent low-carbon basis, strengthening ESG credentials and aligning with increasingly rigorous reporting standards.
4. **Unlocking new revenue streams.** Integrated energy infrastructure can also generate value beyond core operations. Battery storage systems can participate in grid services markets when not required for on-site resilience, creating new, uncorrelated revenue streams. This ability to "stack" revenues enhances project economics and shifts energy infrastructure from a pure cost centre to an active contributor to financial performance.

LEGAL AND STRUCTURAL FRAMEWORKS FOR INTEGRATED PROJECTS

As the commercial model evolves, so too does the legal complexity. Integrated energy and data centre developments require coordinated structuring across real estate, planning, energy regulation and project finance.

CO-LOCATION WITH RENEWABLES (SOLAR AND WIND)

Securing suitable land is the first critical step. Projects must accommodate both large-scale data centre infrastructure and utility-scale generation, often involving complex, multi-stage land agreements that manage planning and grid risks before the full acquisition.

Planning strategies must address the impact of both uses, covering everything from visual impact and glint-and-glare analysis to ecological impacts and construction traffic. In parallel, developers must secure rights for private wire connections, particularly where routes cross third-party land.

At the centre of the structure sits the "private wire" PPA. These long-term agreements govern pricing, the allocation of risk and operational obligations. Careful drafting is essential, particularly around change-in-law provisions, such as for the imposition of a new tax on private generation.

Regulatory compliance is equally important. Private networks operate within a defined licensing framework, and projects must meet applicable requirements while avoiding unintended exposure to regulated supply restrictions.

INTEGRATING BESS

The BESS serves a dual role: supporting resilience and enabling market participation. The legal framework must clearly prioritise operational requirements while allowing commercial optimisation.

Contracts must define how capacity is allocated, how state-of-charge is managed, and how conflicts between resilience and trading activities are resolved. This creates a clear hierarchy that protects uptime while preserving revenue opportunities.

To monetise the BESS's grid-facing capabilities, the project SPV will also need to enter into agreements with system operators and a licensed energy trader. These agreements introduce additional interface risk, which must be carefully aligned with the core operational framework.

FUTURE POWER SOURCES: SMALL MODULAR REACTORS (SMRS)

Looking ahead, some large-scale developments are exploring nuclear solutions to achieve consistent baseload power. Small Modular Reactors (SMRs) offer a potential pathway, but the regulatory and planning landscape remains complex and evolving. Projects in this space must navigate emerging licensing regimes, extensive approval processes and heightened scrutiny. They also face stringent security requirements, particularly where developments qualify as nationally significant infrastructure.

STRUCTURING CROSS-SECTOR JOINT VENTURES

These projects bring together participants from traditionally separate sectors, requiring new approaches to partnership and governance. Data centre and energy investors often have fundamentally different risk appetites, return expectations and investment horizons. The data centre investor's primary focus is on leasing, tenant covenants and uptime, while the energy investor is focused on energy yield, market volatility and the regulatory environment for power

generation. Joint venture structures must reconcile these differences through careful governance and distribution mechanisms that fairly reflect each party's contributions and risk profiles.

The shareholder agreement must clearly address the distinctive risks that arise when energy and data infrastructure are combined – including generation intermittency, regulatory changes in the energy market, and technology risks such as battery degradation over time. These are risks that a traditional real estate investor may not be familiar or comfortable with, and their allocation is a critical point of commercial and legal negotiation.

Structuring for future flexibility is equally important. It is crucial that owners and operators ensure they are structuring operations and customer contracts with future financings and exits in mind. To maximise flexibility, individual data centres on campuses should ideally be ringfenced so they can be sold in different ways: individually, as an entire campus, or as part of a whole portfolio. Structuring in this manner will also make the due diligence process easier for lenders.

THE REGULATORY ENVIRONMENT

The Energy Nexus model does not sit in isolation from a rapidly shifting regulatory backdrop. Governments face a continuing dilemma over the appropriate severity and reach of legislation and regulation that impacts data centres – notably in the areas of planning and sustainability. On one hand, governments are keen to avoid over-regulation that could stifle the innovation and investment they are hoping to attract. However, this must be balanced against competing priorities around sustainability and data protection. For integrated projects specifically, this tension is most acutely felt in planning consents for co-located generation, grid regulatory reform and evolving sustainability reporting obligations – all of which affect the risk profile and viability of the Energy Nexus model directly.

POWERING THE FUTURE OF DIGITAL INFRASTRUCTURE

The integration of power generation with data centre infrastructure marks a decisive shift in the sector's evolution. It responds directly to the realities of power scarcity, cost volatility and rising demands for sustainability. What was once a question of energy procurement has become a matter of strategic control.

These integrated Energy Nexus projects are immense. They demand careful coordination across planning, regulation, financing and long-term operations. But the reward is significant: greater resilience, improved cost certainty, stronger ESG performance and long-term asset value.

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