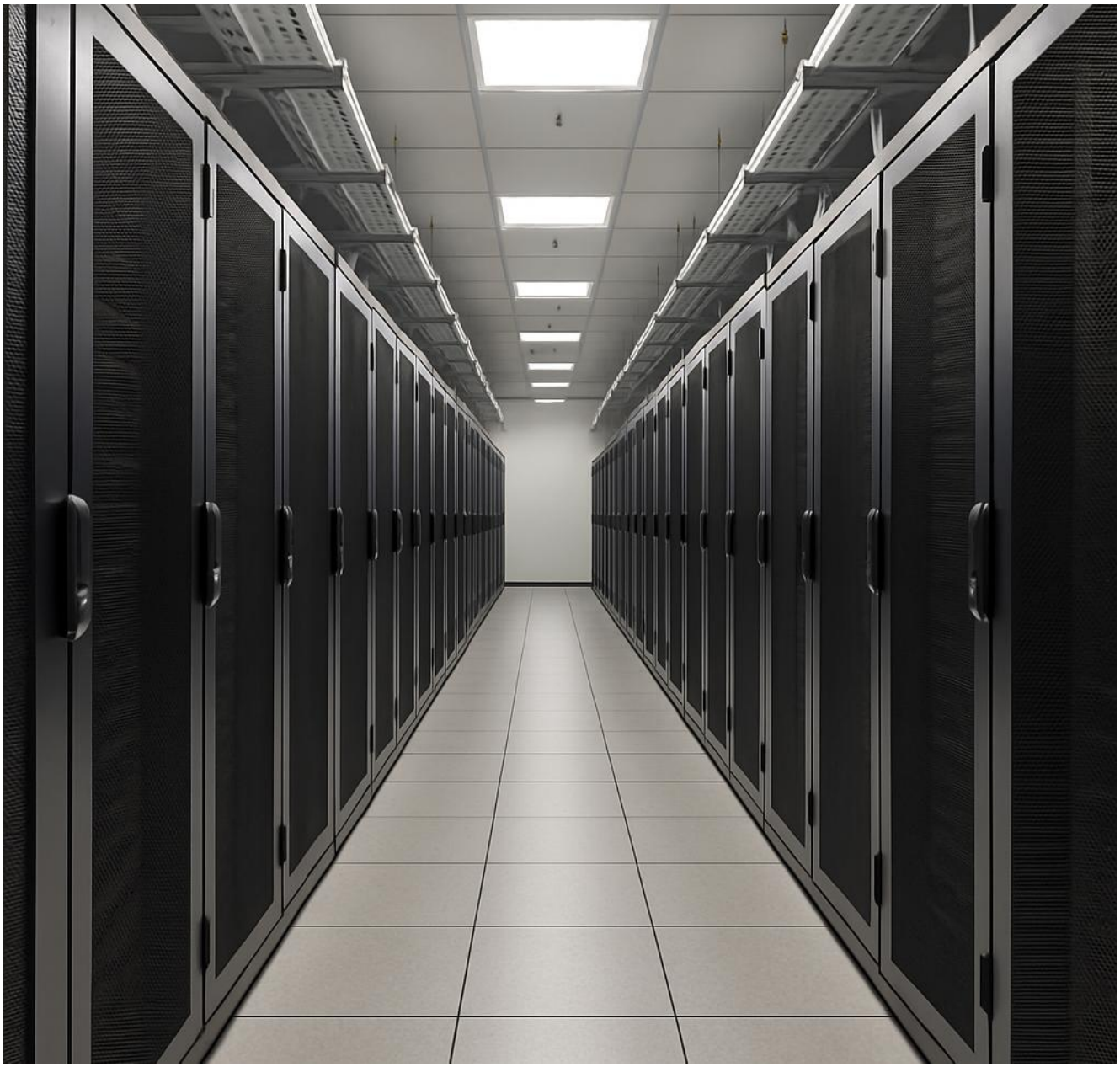

Data Centres in India

Sector report, April 2026

CHAKRA Centre of Excellence, Project Finance and Structuring SBU

SBI CHAKRA
Centre of Excellence for Sunrise Sectors

Preface

India's data centre industry is undergoing a structural shift, propelled by growing digital adoption, regulatory clarity, and the accelerating demand for compute linked to artificial intelligence. As of 2025, installed co-location capacity stands at approximately 1.5 GW. This figure is expected to rise to over 6.5 GW by 2030, underpinned by sustained hyperscaler investments and continued demand from regulated enterprise segments. Capacity growth is geographically concentrated in Mumbai, Noida, Hyderabad and Chennai, supported by access to stable power, submarine cable landing points, and active state-level incentive frameworks.

Policy changes have created a favourable regulatory environment that is steering demand toward domestic, compliant infrastructure. The enforcement of the Digital Personal Data Protection Act (DPDA) and prior RBI directives on data localization have prompted enterprises to reassess infrastructure strategies. AI workloads are further intensifying demand for advanced computing environments, prompting a reconfiguration of data centre design. Rack density, power throughput, and thermal efficiency have become core performance benchmarks. Government-led initiatives, including the IndiaAI Mission, are accelerating investment in GPU clusters and hybrid compute platforms, reinforcing the urgency for scalable, AI-ready infrastructure. In parallel, the GOI has introduced a suite of policy measures to position the country as a global hub for data centres and digital infrastructure. The Union Budget 2026–27 reinforces this direction, notably through a proposed tax holiday for cloud and AI-driven services until 2047, aimed at providing long-term fiscal visibility and supporting a sustained, investment-conducive ecosystem.

These shifts are redefining the occupier landscape. Hyperscale cloud providers are leveraging a mix of leased and built capacity to optimize cost and control, with leasing used for rapid market entry and builds favoured for long-term economics. BFSI and ITeS enterprises are moving from legacy captive infrastructure to colocation formats, driven by regulatory compliance needs and cost rationalization. Meanwhile, digital-native firms are increasingly favouring hybrid cloud solutions that balance performance with capital efficiency. In response, operators such as STT GDC, NTT, Nxtra, Yotta, and CtrlS are scaling aggressively and differentiating through value-added services, renewable power integration, and AI-supportive data centre stacks. Emerging entrants in India include players such as AdaniConneX, Digital Connexion, Equinix, Sify,CapitalLand, RMZ Colt, L&T Vyoma and Reliance Jio.

Technology transitions are influencing both hardware and facility formats. Traditional tower-based servers are being replaced by rack-scale and multi-node architectures to accommodate dense computing loads. SSDs are becoming the dominant storage medium in enterprise deployments, supporting faster I/O and energy optimization. Legacy air cooling solutions are approaching their physical limits, particularly beyond 15 kW per rack, leading to early-stage adoption of direct-to-chip and immersion cooling. The sector also continues to face structural power challenges, with operators deploying battery storage, on-site generation, and redundancy systems. However, dependence on grid stability remains a constraint in Tier 1 cities.

As demand grows, the development model is becoming more capital intensive, requiring structured financing strategies aligned with global precedents. Best-in-class capital frameworks include debt

service coverage thresholds, margin ratchets linked to energy efficiency metrics, and escrow-based cash flow management. Syndicated structures increasingly rely on fixed-price EPC contracts and anchor tenant commitments for a significant share of initial capacity.

India now ranks among the most compelling global markets for digital infrastructure deployment. A confluence of strong demand, policy stability, and rising institutional interest is shaping a deep pipeline of investible assets. For financial institutions, the opportunity lies in adopting an infrastructure-grade underwriting approach that emphasizes long-term cash flow stability, ESG alignment, and contractual safeguards. This requires disciplined avoidance of speculative builds with unclear demand. Priority should be placed on operator-led greenfield developments with clear tenant visibility, low energy intensity, and reliable grid access.

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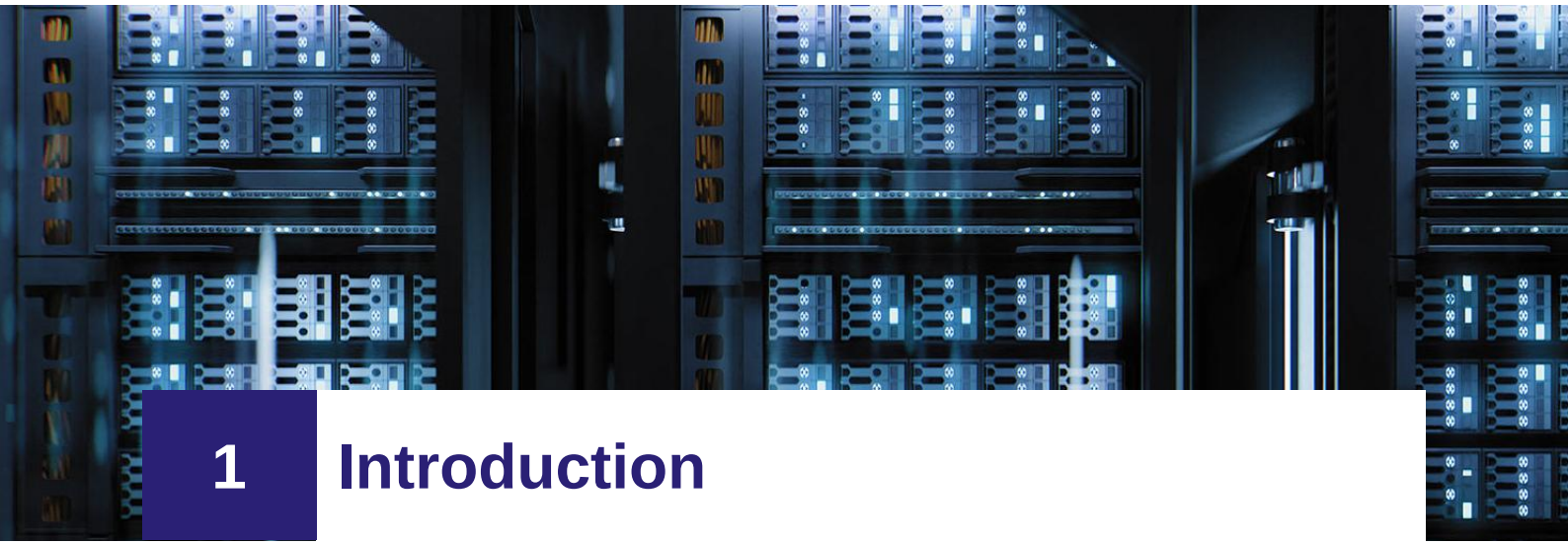
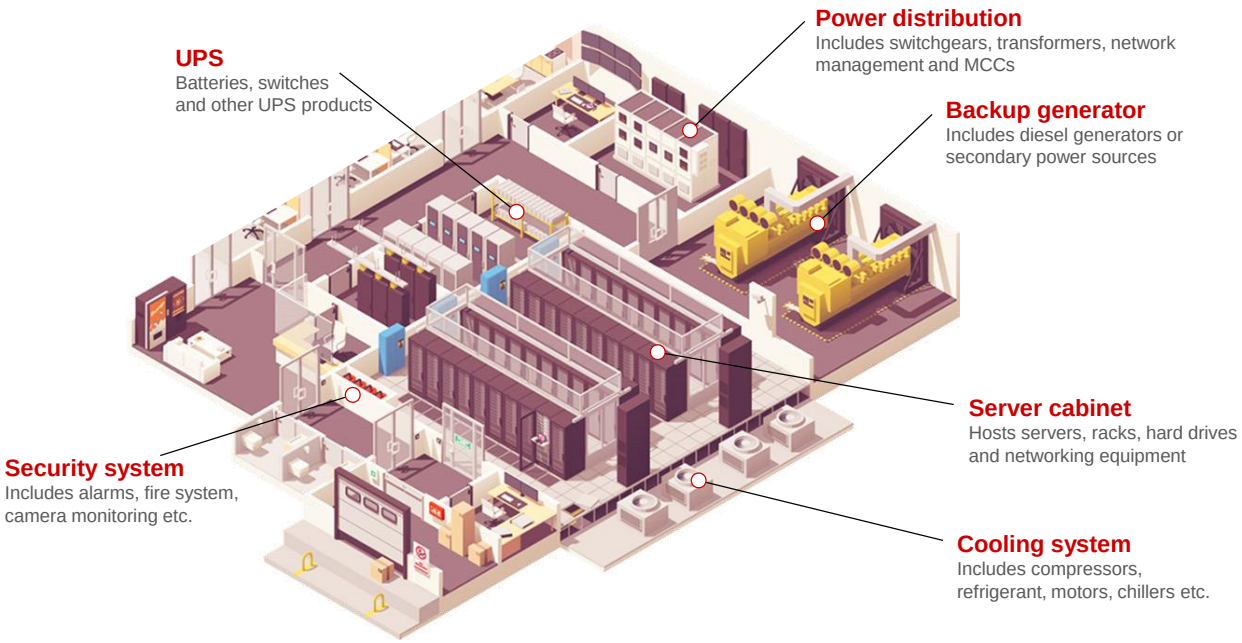


1 Introduction

India’s data centre ecosystem is undergoing rapid transformation, driven by a convergence of technological, regulatory, and market dynamics that are reshaping the country’s digital infrastructure landscape. Historically, organizations maintained on-premises servers to support specific functions like enterprise applications, email, and databases. Over time, these isolated systems have evolved into interconnected, high-performance environments that support mission-critical digital workloads across sectors. Today’s data centres are software-defined, cloud-integrated, and increasingly distributed across public, private, and edge locations. This shift has enabled organizations to manage computing demands more flexibly, while ensuring responsiveness, scalability, and efficiency.

Figure 1: *Data centre schematic and components*



Source: Secondary Research

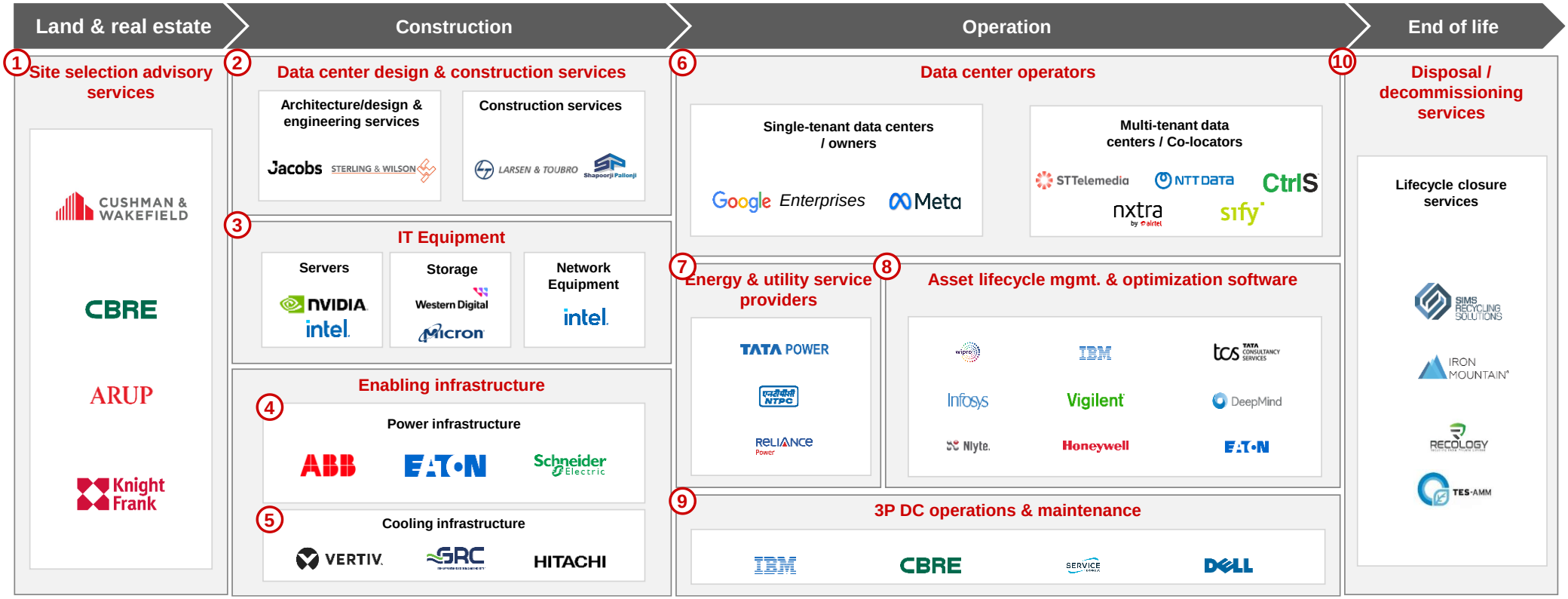
Modern data centres handle far more than storage and virtualization. They support high-performance computing, real-time analytics, disaster recovery, and the infrastructure needed for AI and machine learning deployment. To deliver these capabilities, the facility integrates several tightly linked systems that operate continuously to maintain performance and reliability.

Server cabinets house critical compute and networking equipment. These are supported by power distribution units that manage incoming electricity, UPS systems that prevent disruption during grid failure, and backup generators that provide emergency power. Cooling systems manage heat loads using chillers, compressors, and airflow controls. Security infrastructure ensures asset and data protection through alarms, surveillance, and access control.

Infrastructurally, data centres are supported by three critical subsystems: IT infrastructure, power systems, and thermal management. IT infrastructure includes rack servers, storage arrays, and networking equipment. Power systems provide stable, uninterrupted electricity through transformers, backup generators, and uninterruptible power supplies. Cooling infrastructure ensures that high-density equipment operates within optimal temperature ranges, using precision cooling units, chillers, and fans. These elements must work in tandem to ensure uptime, efficiency, and resilience against system disruptions.

From a lifecycle perspective, the data centre value chain spans across planning, construction, operations, and end-of-life phases, involving a network of specialized contributors that ensure reliable and scalable infrastructure. It can be segmented into the following key phases:

Figure 2: *Data centre value chain (Illustrative and non-exhaustive)*



Source: Secondary research

- **Land and real estate**: Development begins with site selection based on proximity to power and fibre networks. Urban locations offer infrastructure advantages but are often cost-prohibitive, prompting a shift to peripheral zones with better land availability. Land procurement may involve purchase or leasing, and most sites require groundwork unless situated in serviced parks. Advisory firms play a key role in identifying and securing suitable land.
- **Data centre construction**: This includes design and engineering, civil works, mechanical-electrical-plumbing (MEP) systems, and project management. Design firms ensure Tier compliance and efficiency, while contractors handle execution. Project management consultants oversee timelines and quality through commissioning and performance testing.
- **IT equipment**: Data centres house high-performance servers, storage systems, and networking gear to handle data-intensive workloads such as AI and cloud computing. These components form the technological core, impacting performance, scalability, and reliability.
- **Enabling infrastructure**: Power systems include high-voltage transformers, switchgear, UPS, diesel generators, and emerging battery storage. These systems ensure uninterrupted power supply and redundancy. Cooling systems maintain thermal stability in high-density environments using traditional air systems and evolving liquid cooling technologies. Effective thermal management is critical to hardware longevity and energy efficiency.
- **Operations**: Operators manage the full facility lifecycle, from land acquisition to daily functioning. They coordinate with contractors, utility providers, and equipment vendors to ensure reliable uptime. Utility service providers supply power, water, and renewable energy support, while also managing backup systems and efficiency tools.
- **Lifecycle and end-of-life management**: Asset management software supports infrastructure oversight, enabling predictive maintenance, inventory tracking, and cost analysis. Integrated operations and maintenance ensure daily reliability through routine checks, 24/7 monitoring, and physical security.
- **Disposal and decommissioning**: At end-of-life, specialized providers dismantle and recycle infrastructure, ensuring secure data destruction and environmental compliance. This process supports regulatory adherence and facility turnover.

This foundational chapter sets the strategic context for understanding the critical role that data centre operators play in India’s digital economy and highlights the infrastructure-focused lens required to support their continued growth.

2 Data Centre Operators

India’s data centre operator landscape is composed of a mix of entities that differ in ownership, operating models, and client segments. Operators are central to the ecosystem, overseeing facility design, power provisioning, compliance, and service delivery. Their primary role is to ensure seamless infrastructure deployment and reliable operations that meet stringent uptime and security standards. Broadly, operators are classified into third-party co-locators, hyperscalers, enterprises, and edge infrastructure providers. Each plays a distinct role, shaped by differences in scale, customer base, and technical requirements.

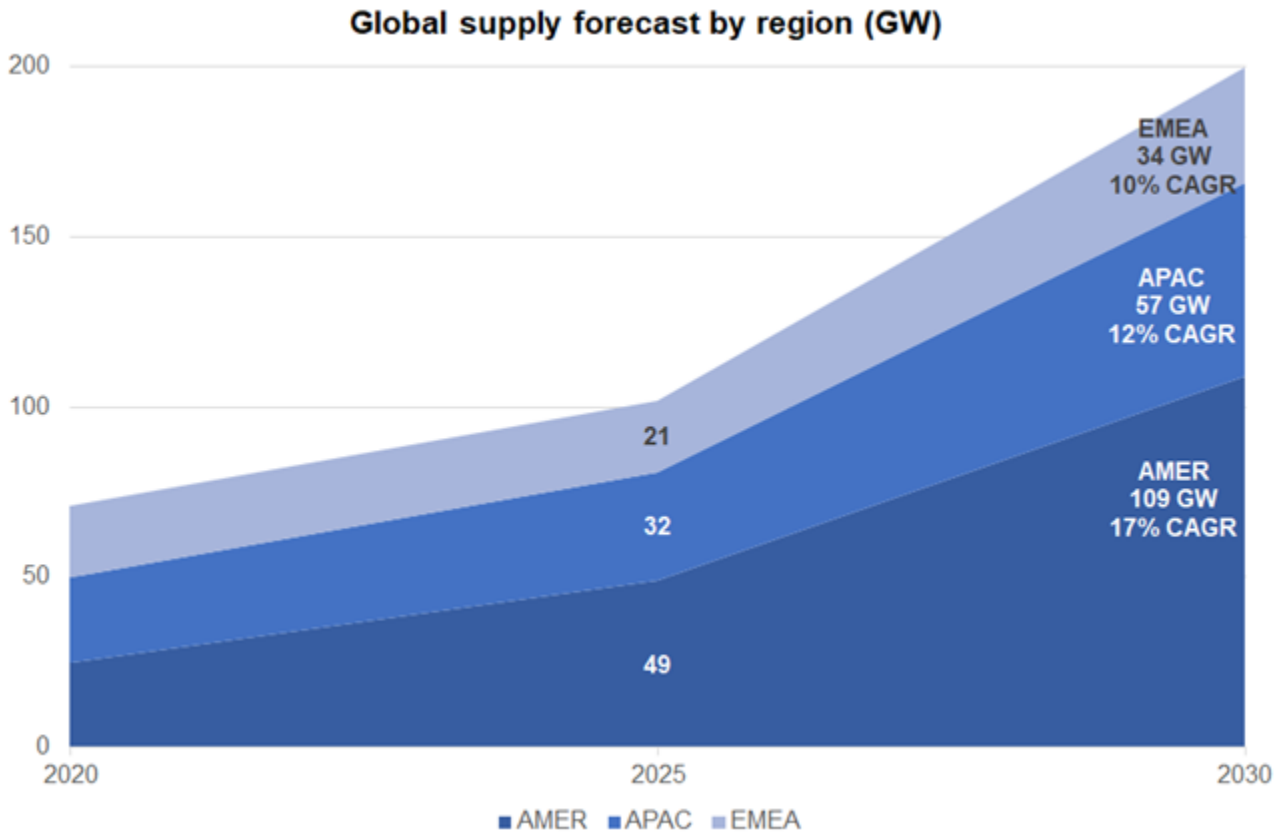
Third-party co-locators are a dominant force in India’s data centre market, providing shared infrastructure environments to clients such as hyperscalers, enterprises, and public institutions. These co-location facilities offer flexible leasing models, carrier-neutral connectivity, and value-added services like remote hands, hybrid cloud enablement, and data migration. They convert large capital expenses into operating costs for clients and enable rapid deployment timelines. Co-locators have evolved from offering basic space and power to delivering full-stack capabilities including GPU-as-a-Service, business continuity solutions, and AI support systems. Operators like STT GDC India, Yotta Infrastructure, and CtrlS are expanding their presence in tier-one and tier-two cities using a mix of leased land, fit-out facilities, and fully owned campuses.

Hyperscalers such as AWS, Microsoft Azure, and Google Cloud drive the majority of global data centre demand and are expanding aggressively in India. Their infrastructure supports both internal operations and public cloud services, including compute, storage, and AI platforms. Hyperscalers adopt a hybrid deployment strategy, owning some data centres while leasing capacity from co-locators to meet near-term demand or enter new markets quickly. They prioritize high-density, efficient facilities and require robust structural design, power availability, and scalability. Strategic decisions on leasing versus owning depend on cost, security, flexibility, and location-specific constraints such as power access or regulatory hurdles.

Enterprise data centre demand is becoming more complex, shaped by the need for AI infrastructure,

data localization, and operational flexibility. Enterprises from sectors such as banking, telecommunications, healthcare, and manufacturing are increasingly relying on co-locators instead of building and maintaining their own data centres. They value capabilities like GPU sourcing, vertical-specific “as-a-service” models, integrated security, and unified dashboards for performance monitoring. Enterprises also expect advisory support on capacity planning, cost modelling, and regulatory compliance. Co-locators offering verticalized solutions tailored to specific industries have a competitive edge as enterprise clients seek speed, security, and service-level clarity.

Figure 3: *Global Installed 3P + Captive Power Capacity*



Source: JLL Research

Note: supply totals include colocation, build-to-suit, hyperscale owner-occupied and on-prem

Globally, the data centre market is expanding at an accelerated pace, particularly in North America, Asia-Pacific, and Europe. Northern Virginia remains the world’s largest hyperscale hub, while markets like Singapore, Frankfurt, and Tokyo face challenges such as land scarcity, power constraints, and rising costs. Southeast Asia and India are now emerging as preferred alternatives for expansion, thanks to lower land costs and growing digital demand.

Data Centres in India

Recent reports from leading agencies indicate that India's data centre industry is entering a hyper-scale growth phase, although estimates vary materially depending on whether the focus is on operational, under-construction, or planned capacity. JLL India estimates operational inventory at 1,123 MW as of H1 2025 and projects capacity to reach ~2.1 GW by 2027, driven by hyperscaler expansion, AI workloads and cloud demand. Cushman & Wakefield India estimates installed capacity at ~1.3 GW in 2025, with an additional ~2.9 GW expected by 2030, implying total capacity of ~4.2 GW by decade end. Jefferies is materially more bullish, projecting India's data centre capacity could scale ~5x to ~8 GW by 2030 amid AI-led infrastructure demand and localisation trends. Meanwhile, CBRE noted India's total data centre stock reached ~1.7 GW in 2025 and expects capacity to rise ~30% YoY in 2026 with ~500 MW of fresh supply additions, supported by sustained investment momentum and AI-driven demand.

Mumbai, Chennai, and Noida are leading capacity growth, supported by submarine cable connectivity, surplus power availability, and state-level incentives.

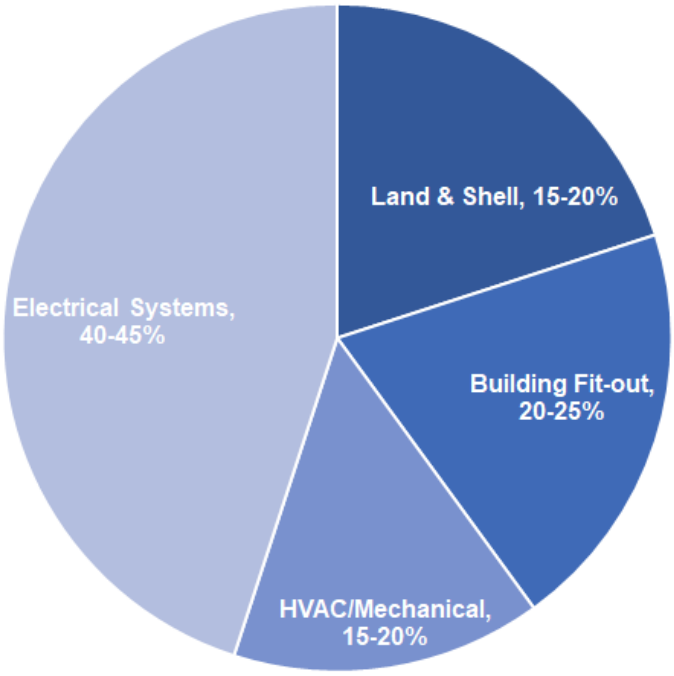
India's third-party co-location market is dominated by players such as STT GDC India, Sify, Yotta, Nxtra by Airtel, NTT Data, and CtrlS. These operators account for over 1 GW in installed capacity and are planning additional capacity exceeding 4.5 GW. Most expansion is concentrated in Mumbai, Noida, Vizag and Chennai. Hyperscalers contribute 60–70% of new demand in co-location centres, with enterprises and government workloads also growing rapidly. Key performance indicators used to evaluate facilities include Power Usage Effectiveness (PUE), Water Usage Effectiveness (WUE), and Carbon Usage Effectiveness (CUE). Industry leaders are achieving PUE values below 1.5, demonstrating high operational efficiency.

Technological trends are reshaping infrastructure demands across the industry. The adoption of cloud services, growth in internet traffic, and increased mobile broadband usage are driving exponential increases in data generation and usage. By 2027, over 75% of India's population is expected to have internet access, and 5G proliferation will accelerate the need for edge deployments. Edge computing is becoming critical to reduce latency and improve responsiveness, especially for time-sensitive applications like autonomous systems and real-time analytics. This shift is leading to the rise of distributed data centres located closer to data sources.

AI workloads are placing entirely new demands on infrastructure. Training and inference processes require GPU-intensive environments, high-speed networking, and scalable storage. AI training generates extremely high power and thermal loads, necessitating specialized cooling technologies and infrastructure planning. Model grounding is compute-intensive and typically occurs in core data centres, while model inference is increasingly deployed at the edge. These trends are driving up both power density and capital costs for new facilities. Data centres optimized for AI are also adopting liquid cooling and immersion systems to handle thermal complexity and improve efficiency.

The implications of these trends are significant. Facilities are shifting from traditional air cooling to hybrid and liquid-based cooling models, which improve energy and water efficiency while supporting high-density configurations. Rack densities are rising, with AI-ready data centres expected to exceed 30 kilowatts per rack. This evolution is influencing facility design, including higher floor loading, raised ceiling heights, and resilient electrical systems. Operators are moving toward modular designs and hybrid cooling systems to improve flexibility and reduce cost over time. Infrastructure choices are being tailored to support a wide mix of applications, including AI development, cloud hosting, disaster recovery, and enterprise compute.

Figure 4:*Typical breakup of data centre capex*



Source: JM Financial

Project cost structures vary widely based on facility specifications. A standard Tier III, non-AI data centre using traditional air-cooling costs INR 50 to 55 crore per megawatt. Facilities designed for AI workloads with immersion cooling or Tier IV redundancy can cost up to INR 75 crore per megawatt. Larger data centres benefit from economies of scale, reducing per megawatt costs to INR 35 to 45 crore. Design decisions around uptime, density, and cooling methods directly impact capital expenditure, and developers must align infrastructure choices with demand forecasts to avoid overbuild or underutilization.

Financially, data centres offer strong margins, with EBITDA typically ranging from 40 to 55 percent depending on the operating model and service mix. Revenue structures vary by format, with retail colocation offering bundled services and wholesale leases relying on separate metering for power. Operating costs are dominated by electricity consumption, particularly cooling, which can account for up to 40 percent of total energy usage. Additional expenses include facility maintenance, staffing, security, and land-related overheads. Sustaining profitability over the long term requires a focus on energy efficiency, high utilization rates, and differentiated service tiers

3 Regulatory & Policy landscape

India’s regulatory and policy landscape for data centres has undergone a significant transformation, with a shift from fragmented oversight to a more proactive and structured framework. This evolution reflects the strategic importance of digital infrastructure in supporting data localization, sovereign cloud mandates, and the rising computational requirements driven by AI adoption and enterprise digitization.

- At the national level, the regulatory foundation was laid with the Draft Data Centre Policy, proposed in 2020. While the policy has not been formally passed as of 2025, it has provided a structured blueprint for sectoral development. Key proposals include the establishment of single-window clearance systems, recognition of data centres as a distinct infrastructure asset class, and the creation of Data Centre Economic Zones (DCEZs) supported by dedicated infrastructure, streamlined permitting, and tailored incentives.
- In 2022, the Government of India formally recognized data centres as part of the Harmonized Master List of Infrastructure sub-sectors. This recognition, under the ‘Communication’ category, enabled access to infrastructure-grade finance, extended loan tenures, and improved access to external commercial borrowings. It also allowed data centres to benefit from infrastructure debt funds and receive exemptions and fiscal benefits under industrial policies. This move improved the sector’s bankability and signaled long-term policy stability for institutional capital.
- In parallel, the Digital Personal Data Protection (DPDP) Act, passed in 2023, introduced a conditional and risk-based localization regime. While it permits cross-border transfers of personal data to jurisdictions designated as "trusted" by the government, it also gives the central government discretionary power to restrict transfers or mandate in-country storage for specific data categories. The Act categorizes entities processing large volumes or sensitive data as Significant Data Fiduciaries, who are subject to enhanced compliance requirements including secure processing, mandatory audits, and significant penalties for breaches. These requirements are accelerating demand for Tier III and Tier IV certified domestic infrastructure.
- Budget 2026–27 Sets the Stage for India as a Global Hub for Cloud and AI Infrastructure. A

tax holiday until 2047 for foreign cloud service providers setting up data centres in India, conditional on serving Indian customers through local reseller entities was proposed. This lowers long-term operating costs, incentivising hyperscalers to commit deeper and longer-term investments in India.

India's regulatory framework for data centres is evolving to reflect national sustainability priorities and international competitiveness. Mandates linked to energy efficiency, carbon accountability, and ESG transparency are influencing investment patterns and tenant selection across both public and private sectors. The Bureau of Energy Efficiency (BEE) has established Power Usage Effectiveness (PUE) benchmarks aligned with India's ECBC and Super ECBC classifications. Since 2024, MeitY tenders for AI cloud infrastructure require data centres to maintain a PUE below 1.35. In parallel, SEBI's BRSR Core framework now mandates the top 150 listed firms to disclose ESG metrics, including energy consumption, water usage, and emissions. These disclosures are becoming critical qualifiers in capital markets and enterprise contracting decisions.

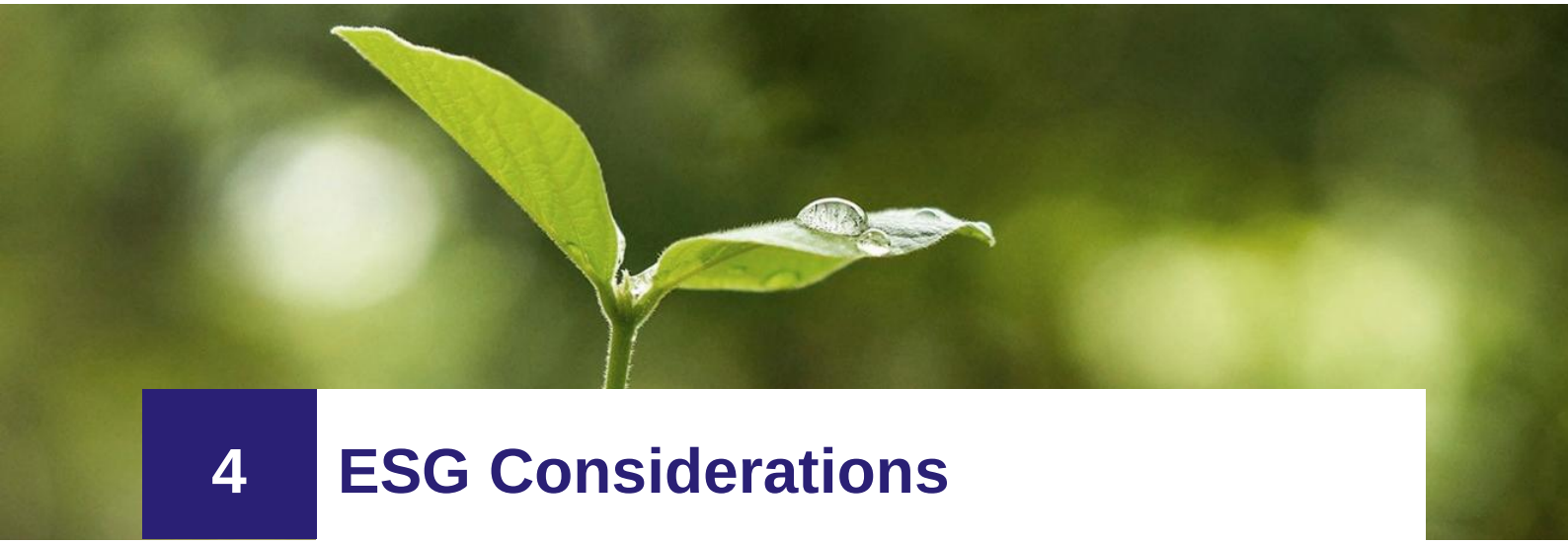
India has also localized global sustainability standards through the IGBC Green Data Centre Rating System. Developed by the Indian Green Building Council, the IGBC framework supports the Digital India mission by codifying best practices for energy, water, and resource efficiency in facility design and operation. The certification system evaluates data centres across energy optimization, operations and maintenance, water management, site planning, materials lifecycle, indoor air quality, and innovation. Ratings range from Certified to Platinum, with Platinum requiring over 80 points across these categories. Energy efficiency remains the dominant scoring area, with PUE-reduction technologies such as server virtualization, high-efficiency HVAC, and on-site renewables playing a pivotal role.

Operators such as STT GDC, NTT Global Data Centres, Nxtra, AdaniConneX, and Reliance Jio are actively embedding IGBC standards portfolio-wide. Facilities achieving Platinum ratings demonstrate global leadership in sustainable infrastructure and are increasingly viewed as strategic differentiators in large-scale colocation bids. Initiatives such as on-site solar generation, battery storage, Zero Liquid Discharge systems, and advanced cooling configurations are now integrated from planning stages in hyperscale campuses. The IGBC rating has become a credible proxy for long-term resilience and operational cost control.

This green certification model is reinforced by state-level incentive regimes. Several states, including Tamil Nadu and Uttar Pradesh, tie fiscal concessions to renewable energy use and local employment generation. Uttar Pradesh provides capital subsidies up to INR 10 crore, interest subvention, stamp duty exemptions, and dual-grid support. Tamil Nadu offers land fee concessions and wage reimbursements for projects sourcing more than 30% of energy from renewables. Karnataka and Haryana supplement these efforts with land conversion exemptions, power duty waivers, and expedited right-of-way clearances.

Globally, India compares favourably across regulatory and ESG vectors. Japan and South Korea offer clarity and capital access but impose constraints such as data localization or data-sharing obligations. China requires local partnerships and enforces stringent privacy controls, creating friction for international entrants. Southeast Asian peers such as Malaysia and Indonesia offer generous tax

holidays and permitting support, but often lack cohesive federal-state coordination. In contrast, India's inclusion of data centres as critical infrastructure, deployment of AI-linked demand mandates, and structured green certification ecosystem positions it as a high-visibility destination for long-term investment in digital infrastructure.



4 ESG Considerations

Environmental, social, and governance (ESG) considerations have become integral to the long-term viability and investment appeal of data centres in India. With rising scrutiny from regulators, financiers, and end-users, operators are being held to higher standards in how they manage environmental impact, social responsibility, and governance practices. ESG performance now directly influences access to capital, project approvals, and client acquisition, making it a core strategic priority for operators and investors alike.

From an environmental standpoint, power usage effectiveness (PUE) remains the industry's principal efficiency benchmark. Achieving lower PUE values signals closer alignment with climate goals, reduced operational costs, and improved eligibility for sustainability-linked capital. India's Bureau of Energy Efficiency (BEE) has codified national benchmarks through the ECBC and Super ECBC classifications, and as of 2024, MeitY tenders for AI cloud infrastructure require data centres to maintain a PUE below 1.35. Leading operators in India are already reporting PUE values between 1.4 and 1.5. Facilities designed for AI workloads are increasingly adopting liquid cooling and smart energy management systems to sustain efficiency under high-density compute conditions.

These initiatives are reinforced by a maturing regulatory framework that integrates environmental metrics into both compliance and market positioning. SEBI's BRSR Core guidelines now require India's top 150 listed companies to disclose ESG performance, including detailed metrics on energy, water, and carbon. These disclosures are emerging as critical filters for enterprise clients and institutional investors. Complementing this, the IGBC Green Data Centre Rating System, developed by the Indian Green Building Council, provides a structured pathway for environmental certification. Facilities are scored across multiple sustainability dimensions, including energy, water, waste, materials, and operations. Ratings from Certified to Platinum are issued based on a 100-point system, with energy efficiency accounting for the largest share.

Operators such as STT GDC, NTT Global Data Centres, Nxtra, AdaniConneX, and Reliance Jio are incorporating IGBC principles into fleet-wide design and operations. Platinum-rated campuses now feature on-site solar, battery storage, advanced airflow control, and Zero Liquid Discharge systems.

These projects are increasingly viewed as both compliance-ready and commercially differentiated in hyperscale procurement processes.

Water consumption is another area of scrutiny, particularly in water-stressed metros such as Bengaluru, Chennai, and Gurugram. Traditional cooling infrastructure can consume tens of millions of litres annually in larger facilities. Newer regulatory requirements mandate submission of water management plans and prioritize treated wastewater or rainwater harvesting. In response, operators are transitioning to dry-mode chillers, closed-loop liquid systems, and on-site tertiary treatment units to meet both compliance thresholds and social license expectations.

Carbon impact remains under close examination. The shift toward low-emission power sources is accelerating, with Scope 1 to Scope 3 emissions tracking gaining currency. Carbon usage effectiveness (CUE) is emerging as a complementary metric to demonstrate reductions in carbon intensity per unit of compute. To this end, forward-leaning developers are integrating power purchase agreements with renewable generators, installing rooftop solar, and exploring fuel alternatives such as hydrogen-based backup systems. These measures align with India's national climate commitments to cut emissions intensity by 45% by 2030 and achieve net-zero by 2070.

Social performance in the data centre sector includes worker health and safety, equitable employment practices, and community engagement. Operators are implementing international best practices in construction safety, offering inclusive employment opportunities, and investing in CSR programs around digital literacy, education, and health. The focus on DEI (diversity, equity, and inclusion) is also growing, with firms incorporating gender and minority representation targets in workforce planning.

Governance maturity is increasingly becoming non-negotiable. Operators are expected to maintain high standards in data security, regulatory compliance, and vendor management. Certifications such as ISO 27001, GDPR compliance, and adherence to India’s Digital Personal Data Protection Act are baseline requirements. Boards are also expected to oversee ESG performance, publish BRSR Core-aligned disclosures, and enforce accountability across their supply chains. Third-party risk management is tightening, with ESG audits becoming standard in vendor onboarding and project finance evaluation.

Collectively, these shifts are positioning ESG not as a secondary compliance issue, but as a fundamental driver of competitiveness and long-term resilience in the data centre industry. Operators that can deliver high-efficiency, low-impact infrastructure while maintaining strong governance and social value creation will be best positioned to attract institutional capital and anchor tenants. ESG is now not just about risk mitigation, but a strategic asset in India's digital infrastructure race.

5 Opportunities, Challenges, & Risks

Opportunities

India's data centre sector is entering a period of sustained opportunity, driven by strong digital growth, expanding cloud adoption, and a supportive policy environment. The country is becoming a strategic regional hub for digital infrastructure, attracting hyperscalers and global enterprises with its cost advantages, deep talent pool, and geographic proximity to Southeast Asia and the Middle East. Mumbai, Noida, and Chennai are leading this expansion due to their power surplus, robust connectivity, and proactive state-level incentives. Following are the key opportunities in the data centre sector:

- **India's emergence as a regional digital hub**: Projections suggest a three-to-seven-fold rise in national capacity by 2030, to 4.5-10 GW, driven by enterprise digitization, hyperscaler investment, and regulatory mandates. With geographic proximity to Southeast Asia and improving connectivity, India is positioned as a regional interconnection hub.
- **Rising enterprise demand due to data localization mandates**: Regulations such as the RBI mandate on payment data storage, SEBI's compliance for financial market data, and the DPDP Act (2023) are compelling enterprises to repatriate data and adopt in-country hosting, particularly in Tier III and Tier IV compliant facilities.
- **Growing investor and client preference for green data centres**: There is increasing demand for sustainable infrastructure. Operators implementing advanced cooling systems, renewable sourcing, and energy-efficient designs are seeing higher customer interest. Examples include NTT's liquid immersion cooling and CtrlS's LEED Platinum-certified facility.
- **Supportive policy landscape under IndiaAI Mission**: The government's IndiaAI initiative, backed by an allocation of INR 10,300 crore, supports AI infrastructure development, including subsidized GPU access and foundational model hubs. This mission is driving demand for high-density, AI-optimized data centre capacity.
- **High customer stickiness and long-term relationships**: Enterprise clients show strong retention due to mission-critical workload dependencies, complex migration, and low marginal

renewal costs. Once deployed, infrastructure is rarely shifted, contributing to long-term contract stability.

Challenges

At the same time, the sector faces several key challenges. The following is the list of key challenges:

- **Compute demand is outpacing efficiency gains**: AI workloads, particularly model training, are growing at a faster pace than hardware efficiency improvements. Power usage is rising significantly, with increasing share of AI training load, increasing infrastructure stress.
- **Limited land and connectivity in high-demand regions**: Prime cities like Mumbai, Chennai, and Noida dominate due to fiber and power access but face land scarcity, regulatory delays, and environmental vulnerabilities. Secondary cities offer space but lack robust interconnectivity, limiting expansion.
- **Underdeveloped domestic infrastructure ecosystem**: India's data centre ecosystem lacks adequate local capacity in power systems, HVAC, lithium-ion storage, and modular construction. This increases import dependence, costs, and timelines for project delivery.
- **Impact of DeepSeek-like efficient AI models**: Efficient AI models such as DeepSeek reduce hardware and power requirements, allowing operation on medium-density racks. This trend may reduce urgency for hyperscale-grade builds and delay returns on high-capex infrastructure.

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APPENDIX

Appendix A: Glossary of key terms

Term	Description
Absorption rate	Absorption in a data center context refers to the percentage of available capacity that has been leased or contracted out to clients.
AI Workloads	Computing tasks (e.g. model training, inference) needing high-performance infrastructure and heavy processing power.
Anchor Tenant	Major long-term customer that underpins viability and financing of a data centre project.
Brownfield Project	Expansion/redevelopment of existing data centre sites, using existing infra.
BRSR (Business Responsibility and Sustainability Reporting)	Mandatory ESG disclosure framework for large Indian firms.
Captive Data Centre	Privately owned facility used exclusively by one enterprise.
Cloud Interconnect	Direct links between data centres and cloud providers; improves latency.
Colocation (Co-lo)	Leasing space, power, and cooling to multiple clients who bring own gear.
Cooling Infrastructure	Systems to manage temperature/humidity and prevent IT overheating.
CUE (Carbon Usage Effectiveness)	Carbon emitted per unit of IT energy used.
Data Localization	Legal requirement to store/process certain data within national borders.
Distributed Edge	Small data centres close to users/devices for low latency.
Edge Data Centre	Localised facility supporting latency-sensitive processing.
Enterprise Data Centre	Internally operated data centre for enterprise applications and

Term	Description
	data.
Greenfield Project	New build on undeveloped land; high capex, full design flexibility.
Hybrid Cooling	Mix of air and liquid cooling to support varying rack densities.
Hyperscaler	Operator of large-scale, global data infrastructure (e.g. AWS, Azure).
Immersion Cooling	Servers submerged in non-conductive fluid for efficient cooling.
Interconnection	Network links within data centres to connect tenants and cloud providers.
IT Load	Power drawn by servers and network gear in a facility.
IT Infrastructure	All tech hardware in a data centre – servers, storage, networking.
Liquid Cooling	Uses chilled liquids to extract heat from servers.
PUE (Power Usage Effectiveness)	Total power vs. IT power; lower is more efficient.
Rack Density	Power consumed per rack, usually in kW.
Retail Co-lo	Small-scale space leasing (rack/cage) in shared facilities.
Single-Tenant Lease	One tenant occupies entire facility or dedicated hall.
SLL (Sustainability-Linked Loan)	Loan tied to hitting sustainability targets (e.g. lower PUE).
Switchgear	Power distribution equipment used to control and isolate circuits.
Tier III / Tier IV Data Centre	Uptime classifications: Tier IV offers highest resilience.
UPS (Uninterruptible Power Supply)	Battery systems bridging power outages before generators kick in.

Term	Description
WUE (Water Usage Effectiveness)	Measures water efficiency per unit of IT energy consumed.
SLA (Service Level Agreement)	Contract defining uptime, response times, and service obligations.
DCIM (Data Centre Infrastructure Management)	Software for real-time monitoring and management of facility resources.
Latency	Delay in data transmission; critical for time-sensitive workloads.
Redundancy	Backup systems (power, cooling, network) to avoid single points of failure.
Cross Connect	Physical cable connecting two different customers or services within a data centre.
Megawatt (MW)	Unit of power capacity; key metric for facility size and power draw.
High-Performance Computing (HPC)	Specialized systems for intensive compute tasks (e.g. simulations, analytics).
Modular Data Centre	Prefabricated, scalable units for quick deployment.
Power Shell	Basic facility infrastructure with power and cooling, not yet fully fitted out.

Appendix B: List of Figures

Appendix C: Reference data and sources

(This section lists sources and reports referenced throughout the narrative for further reading. These provide industry statistics, regulatory details, and case studies mentioned above. These are the list of key references; the list below is not exhaustive as research includes literary searches)

- JLL, “India Data Centre Market Dynamics, 2024” – Industry report (April 10, 2025) indicating growth from 350 MW to 1,030 MW in installed capacity between 2019 and 2024, and analysing trends like hyperscaler demand
- Cushman & Wakefield Research, Global Data Centre Market Comparison (2024) — For Global analysis
- Cushman & Wakefield Research, Is India building enough to power its Digital transformation? – For India demand analysis
- Anarock Capital, “India Data Centre Market: Growth, Trends and Outlook, March 2025” – Noting $6.5 B investment and capacity rising to ~1.4 GW by 2024
- CBRE, “2024 India Data Centre Market Update” (Dec 11, 2024) – Highlighting 1,255 MW live by Sep 2024 and projection of ~1,600 MW by end-2024
- W. Media, “India’s Hyperscale Ambitions, 2023” – Insights into hyperscaler build vs lease strategies in India
- S&R Law, “Data Centres in India: Opportunity and Incentives” (Feb 2023) – Summary of state incentives (stamp duty waivers, power tariff, land conversion support) provided in policies
- Uptime Institute, “Global Data Centre Survey 2023” – Gave global PUE averages (~1.57 in 2022) and trends in renewable adoption by operators
- Equinix Investor Relations – Data on Equinix’s renewable energy usage (100% in many regions) and its interconnection services, relevant to the case study and competitive landscape
- Reserve Bank of India Circular (April 2018) – Mandating payments data localization in India
- Digital Personal Data Protection Act, 2023 – Government of India Gazette (Aug 2023) – The new data protection law emphasizing local storage and accountability for personal data
- Press releases from Yotta, CtrlS, STT GDC, etc. – For factual details on specific projects, e.g., Yotta’s NM1 launch (2020), STT GDC’s green bond issuance, Nxtra’s Carlyle deal
- Department of Telecommunications (DoT), National Digital Communications Policy 2018 – References to promoting cloud and data centres as infrastructure
- Press Information Bureau (PIB) releases – e.g., announcements in the 2022 Union Budget speech granting data centres infrastructure status
- Economic Times, CIO magazine interviews with industry executives – Provided qualitative insights and quotes (e.g., on AI driving DC demand, or on financing trends)
- Project documents for State Data Centre schemes (MeitY) – for PPP structure information (like the Telangana SDC case)

- JM Financial, *"Data Centre 101: India's Cloud Moment" (27 March 2025)* – Provided thematic insights on India's data centre market, including operator economics, power usage trends, and competitive benchmarking across key players
- PIB- Data centre capacity in the country has increased from about 375 MW in 2020 to around1500 MW by 2025 - https://www.pib.gov.in/PressReleasePage.aspx?PRID=2239616&reg=3&lang=1
- PIB- Budget 2026–27 Sets the Stage for India as a Global Hub for Cloud and AI Infrastructure https://www.pib.gov.in/PressReleasePage.aspx?PRID=2227953&reg=3&lang=2
- JLL - 2026 Global Data Center Outlook
- JLL - India Data Centre Market Dynamics Report H1 2025
- Cushman & Wakefield - INDIA DATA CENTRE H1 2025 UPDATE
- CBRE - India's Data Centre Market in a New Era
- The Hindu BusinessLine - How AWS, Microsoft, Google, Adani and Reliance are driving India's data centre boom