CRE FINANCE COUNCIL EDUCATION SERIES

DATA CENTER E-PRIMER

Understanding the New Infrastructure of the Digital Economy

January 2026

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EXECUTIVE SUMMARY

One company's trillion-dollar bet is reshaping commercial real estate. OpenAI has telegraphed roughly $1.4 trillion in multi-year data-center-related commitments through approximately 2033 (late-2025 management guidance; not signed capex). This figure reflects the scale of ambition driving the sector, though execution depends on funding, power availability, and market conditions. Across Big Tech, capital expenditure reached ~$443 billion for the top five U.S. hyperscalers in 2025 (+73% YoY), with CreditSights projecting ~$602 billion in 2026 (+36% YoY). Capital intensity has surged to unprecedented levels (45–57% of revenue at several hyperscalers), and ~75% (~$450 billion) of 2026 capex is expected to be dedicated to AI infrastructure.

Why should CRE professionals care? Data centers have evolved from a niche property type to a scaled, securitized market, with ~$57 billion in U.S. issuance since 2021 (full-year 2025, preliminary)—including ~$15 billion in ABS and ~$11 billion in CMBS in 2025 alone. Looking ahead, several sell-side desks project $30–$40 billion per year in gross data-center securitization supply in 2026–27, with Morgan Stanley estimating ~$130 billion in U.S. data-center securitized-credit net issuance (ABS + CMBS) across 2026–28. The sector now represents a significant share of the ABS market, rivaling established asset classes such as equipment leasing. Data centers are an essential component of digital infrastructure, and capacity continues to expand as cloud and AI workloads scale. Securitizations now span both CMBS (SASB/large-loan) and ABS (master trust) structures, each with different collateral and sizing frameworks.

This primer explores four fundamental questions that every CRE professional should understand:

1. What exactly is a data center, and how does it generate revenue?
2. Why is everyone racing to build them despite massive capital requirements?
3. How are these properties financed, and what makes them different from traditional real estate?
4. How do rating agencies and investors evaluate these unique assets?

A Notable Shift Is Underway. While traditional real estate trades on location and square footage, data centers trade on power measured in megawatts, with pricing benchmarks expressed as $/kW/month (typical ranges vary by business model and market). A single hyperscale facility can draw over 100 MW—the consumption of ~75,000 homes (~750 homes per MW; estimate based on EIA data). With AI increasing load requirements, grid interconnection and availability are often the primary constraints on development timelines. This fundamental reality is increasingly shaping CRE decision-making, forcing market participants to understand power purchase agreements as deeply as they once understood location demographics.

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PART 1
Understanding the Asset

What Is a Data Center?

At its core, a data center is a specialized facility that houses computer servers and networking equipment. Think of it as a factory for computation—but unlike traditional warehouses, where tenants pay for square footage, data center tenants primarily pay for reliable, uninterrupted electricity. If the power fails for even a few minutes, entire operations can be disrupted, making redundancy and reliability essential operational requirements.

Three Distinct Business Models

Type	Typical Size	Tenant Profile	Lease Terms	Monthly Rent
Hyperscale	40-100+ MW	Single tech giant (think single-tenant industrial)	10-15 years	$100-$150/kW/month
Wholesale Colocation	5-40 MW	Multiple enterprises (think multi-tenant office)	5-10 years	$150-$250/kW/month
Retail Colocation	1-10 MW	Many small tenants (think retail strip center)	1-3 years	$200-$400/kW/month

Ranges reflect primary U.S. markets, 2025-vintage leases. Emerging AI deployments frequently exceed 50–100 kW/rack, which can pressure PUE and OpEx if cooling infrastructure is not upgraded accordingly.
Source: KBRA, CBRE

How Data Centers Make Money

The revenue model varies significantly by facility type, reflecting the different services provided and customer needs served. Hyperscale facilities operate much like single-tenant industrial properties, generating 70–80% of revenue from base rent for power capacity, with another 15–20% from metered power pass-through charges. Margins are high relative to typical CRE because power is often passed through and staffing is lean; however, actual property cash flow varies by design and the local electric rate plan.

Colocation centers function more like multi-tenant office buildings, with revenue streams that reflect their more complex operations. Cabinet and cage rentals generate 40–50% of revenue, while power charges account for another 30–40%. The remaining revenue comes from cross-connect fees, which allow tenants to interconnect with carriers and other tenants (10–20%), and from managed services (5–10%). Due to higher operational complexity and staffing requirements, colocation centers typically achieve NOI margins of 40–50%.

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Lease Structures: The Risk Allocation Framework

Unlike traditional CRE, data center leases allocate operational responsibilities in unique ways that directly impact credit analysis:

Lease Structures

Lease Type	Triple Net (NNN)	Modified Gross + Electric (MG+E)	Full Service/Gross
Tenant Pays	Base rent + property taxes + insurance + maintenance + utilities	Base rent + metered power consumption	Single all-inclusive rate
Landlord Covers	Shell and core infrastructure	Property taxes, insurance, common area maintenance	Everything, including power
Typical Users	Hyperscale tenants (AWS, Microsoft, Meta)	Wholesale colocation, enterprise tenants	Retail colocation, <1MW requirements
Risk Profile	Lower OpEx volatility but higher renewal concentration	Moderate - power pass-through reduces commodity risk	Higher OpEx volatility but diversified tenant base
Pricing	$100-$150/kW/month	$150-$250/kW/month	$200-$400/kW/month

Source: CREFC compilation

Critical distinction from traditional CRE: Power reimbursement can represent 30–50% of total revenue, with PUE (Power Usage Effectiveness) adjustments increasingly common. Recent hyperscale and MG+E lease forms increasingly include PUE caps and/or energy-efficiency sharing provisions to align landlord-tenant incentives. For underwriting purposes, treat power pass-throughs and PUE adjustments as distinct cash-flow levers. A PUE cap of 1.4, for example, means the tenant isn't responsible for inefficiency above that threshold—shifting operational risk to the landlord.

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The Critical Infrastructure

What distinguishes a data center from other real estate isn't the building shell—it's the mechanical, electrical, and plumbing (MEP) systems that can account for 60–70% of total development costs. Understanding this infrastructure is essential for any CRE professional entering the sector:

Critical Infrastructure: Key Systems

System	Function	% of Total CapEx	Replacement Cycle
Power Distribution	Utility to server delivery	25–30%	25–30 years
Backup Power	Generators and batteries	15–20%	Batteries: 3–7 years Generators: 20–25 years
Cooling Systems	Heat removal	20–25%	15–20 years
IT Infrastructure	Racks, cabling, security	10–15%	7–10 years
Building Shell	Structure and envelope	20–30%	40–50 years

Source: KBRA (observed ranges)

The redundancy hierarchy directly impacts both cost and reliability:

- **N** = No redundancy (basic capacity)
- **N+1** = One backup component (standard for enterprise)
- **2N** = Full duplicate systems (select deployments/rooms; N+1 is the common baseline for hyperscale power)
- **2N+1** = Full duplicate plus additional backup (mission-critical applications)

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PART 2
Market Dynamics and Key Players

Demand Drivers

Three powerful waves are driving strong growth in data center demand, each reinforcing the others, suggesting sustained expansion rather than a temporary boom.

The first wave, **cloud migration**, continues its steady march as enterprises shift from on-premises computing to cloud services at rates of 20–25% annually. Federal initiatives around cloud-smart postures and zero-trust security architectures are accelerating this transition, while healthcare and financial services sectors are finally overcoming regulatory hesitation to embrace digital transformation.

The second wave, **AI training**, represents exponential rather than linear growth. OpenAI's ChatGPT exemplifies this trajectory. Usage has scaled to hundreds of millions of weekly users by late 2025, and API volumes have grown by an order of magnitude+, directly translating into compute demand. Between 2012 and 2018, compute usage in the largest training runs doubled approximately every 3.4 months; more recent estimates suggest a slower pace. A single large language model training run can consume $100 million in computing resources. At the same time, OpenAI's infrastructure agreements with silicon providers represent hundreds of billions in compute capacity investments over the next five years.

The third wave, **AI inference**—actually running these models for billions of users—may ultimately prove larger than training. As models become embedded in everyday applications from search to productivity software, the computational requirements shift from periodic training runs to continuous inference processing. Industry analysts project inference workloads will consume 60–70% of AI compute capacity by 2027, fundamentally altering data center design requirements toward lower-latency, distributed architectures.

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Power: The Primary Constraint

The power reality has become a central challenge of the data center industry, with geographic markets increasingly differentiated by their electrical infrastructure rather than traditional real estate fundamentals:

Market Comparison

Region	Current Capacity	Available Power	Queue Time	Key Constraint
Northern Virginia	2,500 MW	Severely constrained	3–5 years	Transmission capacity
Phoenix	800 MW	Available	2–3 years	Water for cooling
Columbus	500 MW	Abundant	1–2 years	Limited fiber
Dallas	600 MW	Moderate	2–3 years	Grid stability
Silicon Valley	400 MW	Severely limited	5+ years	Everything

Source: Utility filings, CBRE; Goldman Sachs Power Tracker (Jan. 20, 2026)

Goldman Sachs warns that almost all U.S. regional grids will lack critical spare capacity (defined as <15% reserve margin) by 2030, with over half of regional markets reaching "critical tightness" in 2025.

The Cost of Concentration

Northern Virginia is located within **PJM Interconnection**, the regional transmission organization serving 65+ million people across 13 states from Illinois to the mid-Atlantic, and faces severely constrained interconnections, with many large connections effectively deferred beyond 2026.

After PJM's December 2025 capacity auction, Monitoring Analytics estimated that data center load accounted for $6.5 billion — 40% — of the $16.4 billion in auction costs. Across three consecutive auctions since mid-2024 (delivery years June 2025–May 2028), data-center-attributable costs totaled $23.1 billion, representing 49% of the $47.2 billion total. This cost attribution is driving regulatory focus on ensuring data center operators bear their fair share of grid investment—and has made PJM interconnection queues and capacity auction results key metrics for the sector.

Despite supply constraints, U.S. data center capacity additions reached record levels in 2025—1.4 GW in December alone and 10 GW for the full year. PJM upgraded its 10-year peak summer demand growth forecast from 3.1% to 3.6% annually, reflecting confidence that current bottlenecks will be resolved later this decade even as near-term queues remain extended.

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Equipment bottlenecks compound these challenges materially:

- Electrical switchgear: 52–70 weeks lead time
- Transformers: 70–100 weeks
- Generators: 40–52 weeks
- Advanced cooling systems: 35–40 weeks

The Competitive Landscape

Market concentration has increased notably in 2025, creating both opportunities and risks for the sector:

2025 YTD Leasing Activity (Through October)

Tenant	MW Leased	% of Total	Credit Rating
Amazon (AWS)	1,800	22%	AA
Microsoft	1,500	18%	AAA
Google	1,200	15%	AA
Meta	900	11%	A
Oracle	600	7%	BBB+
Top 5 Total	**6,000**	**73%**	-
All Others	2,200	27%	Varied

Source: Various (ratings shown reflect long-term issuer ratings as of Oct 2025)

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PART 3
Financing Evolution

The Capital Markets Transformation

The shift from corporate balance sheets to third-party capital is among the more notable developments in CRE financing. Moody's estimates that at least $3 trillion will flow into data-center-related investments through 2030—spanning servers, facilities, and power infrastructure—underscoring that this is now a credit-markets story, not just an equity one. In 2021, technology companies self-funded 80% of data center development, viewing these facilities as strategic assets too essential to entrust to third parties. By 2025, that equation has reversed, with 60% of development involving institutional capital as even the deepest-pocketed tech giants recognize they cannot fund infrastructure expansion alone.

Construction and Development Finance

Data center construction spending is projected to rise 23% in 2026, now representing over 6% of all U.S. nonresidential building construction—up from just 2% in 2023. This growth stands in stark contrast to flat or declining construction spending across traditional office, hotel, apartment, and warehouse sectors.

Senior construction loans now fund 55–65% of costs, typically requiring ~60% pre-lease commitments. Mezzanine and preferred equity fill another 15–25% of the capital stack, offering returns of 12–15% with payment-in-kind (PIK) toggle options increasingly common. GPU and cooling capex inflation is pushing more tenant-funded build-outs and shared delivery-risk provisions into documentation.

The recent Meta Louisiana transaction illustrates how the market is using newer structures while addressing risk. With a total investment of ~$30 billion, this transaction is part of Meta's broader 2025 capital strategy, which also includes a separate $30 billion public bond offering (the year's largest) and additional JV financing. Notably, the Louisiana deal reportedly includes residual value guarantees if Meta exits early, effectively de-risking the development for both lenders and investors. These termination protections are deal-specific and not yet standardized across the market.

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Permanent Financing: The Securitization Market

Securitization volumes have increased materially since 2021:

ABS & CMBS Issuance Summary

Year	ABS Issuance	CMBS Issuance	Total	Avg. Deal Size
2021	$6.2B	$3.2B	$9.4B	$690M
2022	$1.0B	$0.3B	$1.3B	$320M
2023	$5.9B	$2.7B	$8.6B	$450M
2024	$8.4B	$3.0B	$11.4B	$630M
2025 (full-year)*	~$15B	~$11B	~$26B	~$1B

*Preliminary; subject to final Q4 tallies. U.S. volumes; CMBS reflects SASB/large-loan only.
Source: J.P. Morgan (Nov. 2025 YTD) + late-year deal flow (Vantage, SF ABS, QTS, BX 2025-VOLT); Morgan Stanley (Jan. 2026) for 2026–28 forward mix.

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ABS vs. CMBS: Choosing the Right Structure

There is no clean collateral divide: both ABS and CMBS have financed retail colocation, enterprise, and hyperscale assets. Selection often turns on structure (master trust flexibility for growth vs. SASB fit for JV/multi-jurisdiction financing) rather than asset type.

ABS vs. CMBS – Choosing the Right Structure

Consideration	ABS Structure	CMBS Structure
What's pledged	Equity in operating company; cash flows; mortgages on real property; assignment of leases	Mortgage on real estate; assignment of leases; cash flows
Typical advance rate	75–80% of cash flow	65–70% LTV
Growth flexibility	Can add assets meeting criteria	Fixed collateral pool
Documentation	500+ pages, complex waterfall	200–300 pages, standard
Investor base	Structured-finance ABS buyers (incl. esoteric ABS specialists)	CMBS SASB/large-loan investors (CRE-focused)
Best for	Diverse pools and changing assets	Fixed assets
Refi/Take-out Lens	ARD take-out feasibility; residual value secondary in some methodologies	Current value via cap rate; refinance based on property valuation

Note: ABS "advance rate" reflects cash-flow sizing; CMBS uses LTV—metrics are not directly comparable.
Source: Various

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Notable Recent Transactions:
(Illustrative, not exhaustive; see Sources for presales and trade coverage.)

DataBank COLO 2026-1 (ABS)—January 2026

- Size: $665 million
- Portfolio: 36 retail colocation and carrier-hotel assets across ~15 U.S. markets; ~258 MW; ~1.62 million usable square feet; ~1,750 tenants
- Structure: Master trust; 5-year ARD (February 2031); term notes plus VFN; standard cash-sweep triggers
- Ratings/metrics: Moody's (P)A3 on the A-2 term class; KBRA assigned preliminary ratings on the A-2 and B classes; initial LTV ~48–50%
- Significance: Largest diversified colocation portfolio securitized to date; demonstrates that retail colo scale and tenant diversification can clear investment-grade thresholds under newer ABS frameworks

Blackstone / QTS—BX 2025-VOLT (CMBS SASB)—November 2025

- Size: $3.5 billion (the year's largest data-center CMBS to date)
- Collateral: ~10 QTS data centers across multiple U.S. markets
- Structure: Floating-rate SASB; two-year initial term with three one-year extension options
- Reception: D notes reportedly ~23x oversubscribed

QTS—Phoenix ABS (QTS Issuer ABS II LLC, Series 2025-1)—September 2025

- Size: ~$600 million
- Collateral: PHX2 DC2 data center (Phoenix), ~36 MW; single hyperscale tenant under triple-net lease
- Structure: 5-year ARD (Oct 2030)
- Ratings/metrics: S&P A- (sf) senior class; ~58.6% LTV

Switch—SWCH 2025-DATA (CMBS SASB)—February 2025

- Size: $2.4 billion
- Collateral: Three Nevada data centers; fee-simple interests
- Structure: Issued as a green-labeled CMBS under Switch's Green Financing Framework

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PART 4

How Agencies Analyze Data Center Risk

Scope & Comparability Notice: This section summarizes rating agency considerations for U.S. data center securitizations, presented *separately* for CMBS (SASB/large-loan) and ABS (master trust) structures. Metrics such as "cap rate" play different analytical roles in each structure (current value in CMBS vs. terminal/residual value in ABS colocation), so values are not directly comparable across tables. Where agencies do not publish explicit bands, ranges shown are *observed in recent presales* and are labeled accordingly. Fitch and Morningstar DBRS each publish criteria that apply across CMBS and ABS; Fitch maintains a single, unified approach that covers both.

The Framework Divergence

Understanding the fundamental analytical lens is crucial. In CMBS, rating agencies view the collateral primarily as real estate—valuing it based on in-place tenancy, leases, and operating expenses, as well as data center market fundamentals. In ABS, agencies also place greater emphasis on the business platform—valuing the durability of contractual cash flows, the quality of the tenant base, and the enterprise's terminal value at the anticipated repayment date (ARD) or the legal final date. This distinction explains why seemingly similar metrics (like "cap rate") serve different analytical purposes in each structure.

In CMBS transactions, the cap rate determines current property value for leverage and sizing purposes. In ABS colocation transactions, the cap rate typically determines the terminal value at the ARD, informing refinancing and take-out assumptions, or the residual value at the legal final, indicating proceeds available for debt paydown. Placing these metrics side by side without this context can be misleading.

Additionally, it is important to distinguish between formal rating methodology documents (which set binding analytical frameworks) and research commentary (which provides market context and observations but is not prescriptive). The citations in this section note this distinction where relevant.

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4.A. Common Analytical Themes Across Agencies

Despite methodological differences, rating agencies converge on several key risk factors that drive their analysis of data center securitizations:

- **Tenant Credit Quality:** Agencies assess tenant creditworthiness and the strategic importance of facilities to tenants. For hyperscale properties, this includes evaluating the facility's role in the tenant's network architecture. For colocation, agencies stress-test scenarios where multiple tenants vacate simultaneously.

- **Power Security & Infrastructure:** Grid reliability, renewable energy sources, utility agreement status, backup power redundancy, and power density capabilities are paramount. Power Usage Effectiveness (PUE) serves as a proxy for asset quality.

- **Connectivity:** Prevalence and proximity to robust fiber networks and carrier interconnection points (meet-me rooms). Agencies assess the efficiency and latency characteristics of local, national, and international data transmission capabilities.

- **MEP Condition & Technology Risk:** Equipment age, remaining useful life, cooling technology (air vs. liquid), and upgrade pathways inform capex reserve requirements and obsolescence risk assessments.

- **Cash Flow Durability:** Lease terms, renewal probability, utilization rates, contractual escalations, and revenue concentration all factor into net cash flow projections and stress scenarios. Below-market rents can serve as a competitive advantage and a tenant-retention incentive—a consideration given the rapid run-up in market rates over the past few years.

- **Structural Protections:** Cash traps, DSCR and LTV triggers, reserve requirements, and (for ABS) hyper-amortization mechanisms post-ARD.

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4.B. CMBS Rating Approaches (SASB / Large-Loan)

For CMBS transactions, most rating agencies apply their existing Large Loan/SASB methodologies, with data center-specific adjustments. The general approach is consistent: estimate sustainable net cash flow (NCF), determine appropriate cap rates to derive stressed property value, and calculate leverage metrics (LTV, debt yield, DSCR) against rating-level benchmarks.

CMBS Rating Approaches

CMBS Considerations	S&P	Moody's	Fitch	KBRA	Morningstar DBRS*
Cap Rate (Current Value)					
- Hyperscale (Observed)	7.5–8.5%[1]	8.0–10.0%	8.0–9.0%	7.0–9.0%	7.0–8.75%◊
- Colocation (Observed)	9.0–11.0%	9.0–11.5%	10.0–11.0%	8.0–10.0%	7.25–8.75%◊
NCF / Cash Flow Approach	Agency NCF; DSCR by rating	Sustainable NCF w/ operational haircut (deal-specific)	Property NCF per CMBS criteria	KNCF per CMBS criteria	Periodic NCF; dis-counted value
Renewal Probability Stress					
- Hyperscale	25%	20–35%	30%	25–35%	20–35%
- Colocation	40%	25–35%	45%	25–35%	20–35%
Qualitative Risk Assessment	Market-based evaluation	Cost, reliability, availability, PUE, density	Curtailment risk; access evaluation	Supply/demand; cost and reliability, PUE, redundancy, market conditions	Grid reliability; power profile & density/ PUE; redundancy (e.g., N+1; up to 2N in select cases); con-nectivity; renewables
Lifecycle Reserves / Capex	2–3% revenue	$4–12/kW/mo + % revenue	$7.50–15/kW/mo[2]	$2–18/kW/mo[3]	Age-adjusted; condition-based
Tenant Credit As-sessment	Facility-utility & tenant obligations per structure	Credit with adjust-ment for termination options	Parent credit; lease term analysis	Tenant credit; tenant mix; tenant diversity	Weighted; lease-level analysis
LTV Benchmarks	Varies by transaction; no explicit cap	N/A in criteria	Per CMBS Large Loan hurdles	Per CMBS methodology with product-specific adjustments	Per CMBS methodology; no fixed rating-level LTV caps (deal-specific)

Note: "Qualitative Risk Assessment" encompasses power and non-power factors (e.g., connectivity and cooling redundancy) as reflected in agency frameworks. Cap rates, reserves, and LTV ranges shown are observed in 2024–2025 presales and deal documents, not prescriptive rating-level bands unless otherwise noted.
*Morningstar DBRS uses a unified methodology for both ABS and CMBS structures.
[1] S&P: Vantage Data Centers Jersey Borrower SPV—Presale (Nov. 11, 2025); value derived from 8.5% WA cap rate.
[2] Fitch: BX 2025-VOLT—Presale; can be as low as $5/kW/month for long-term IG leases.
[3] KBRA: $2–9 for hyperscale; $7–18 for colocation (per KBRA research "MEP: More Than Meets the Eye").
◊ Observed, property-level 2024–25 presales; not portfolio WA and not policy.

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4.C. ABS Rating Approaches (Master Trust Structures)

ABS data center transactions—typically structured as master trusts—involve different analytical considerations than CMBS. The cap rate in ABS primarily informs terminal or residual value at the anticipated repayment date (ARD) or legal final maturity, informing refinance/take-out feasibility rather than today's market value, or recovery value at legal final. Sizing metrics often center on agency-specific net cash flow measures (S&P's utility score approach, Moody's AANOI, KBRA's KNCF, Morningstar DBRS's periodic NCF) and structural triggers (DSCR/LTV tests, cash sweeps) rather than traditional mortgage LTV.

KBRA's Approach: KBRA published its Data Center ABS Global Rating Methodology on January 9, 2026. The framework centers on KBRA Net Cash Flow (KNCF), tenant default and rollover simulation, and ARD/hyper-amortization stress testing. KBRA evaluates asset quality, market concentration, and structural triggers (DSCR/LTV tests, cash sweeps, early amortization events) to determine rating levels.

Moody's Approach: In February 2025, Moody's published a dedicated rating methodology for data center ABS, distinct from its CMBS framework. The methodology employs a Monte Carlo simulation to model tenant defaults and project annualized base rent (ABR) over the transaction's life. Moody's classifies each data center into one of five groups based on asset quality, location, tenant profile, and manager track record—with Group 1 assets (hyperscale, primary markets, investment-grade tenants, experienced managers) assigned the lowest revenue volatility assumptions (5%) and highest growth caps (175%). In contrast, Group 5 assets are subject to the most conservative treatment (23% volatility, 20% growth cap). Notably, Moody's models liquidation proceeds from land value only at legal final maturity, assigning no terminal value to buildings or improvements "owing to the lack of visibility into the building's value in the long term." [4] This conservative assumption distinguishes Moody's from agencies that apply a terminal cap rate to stabilized NOI. HYPER 2025-1, DataBank's inaugural hyperscale ABS issuance (rated September 2025), was the first transaction rated under this methodology and provides a helpful reference point for observed metrics.[5]

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ABS Rating Approaches

ABS Considerations	S&P	Moody's	Fitch*	KBRA	Morningstar DBRS*
Cap Rate Purpose	Terminal value at ARD; refinance feasibility	Liquidation value at legal final maturity; land value only (no building credit)[4]	Reversionary value (unified approach)	Terminal value; recovery analysis	Reversionary value (unified approach)
Primary Sizing Metrics	Utility score; ARD paydown analysis	Moody's AANOI; Moody's Leverage (tranche ÷ AANOI); Idealized Expected Loss tables; Moody's DSCR	Reversionary value combined with post-ARD stressed paydown	KNCF / KLTV / cash-flow modeling results	LTV via Periodic NCF; coverage ratios
Max LTV (Master Trust)	Per transaction; no universal cap	Deal-specific; observed ~66–72% in 2025 presales; Class A LTV trigger at 70%[5]; CLTV defined net of liquidity reserve[6]	Per transaction	Observed mid-60s to ~70%; rating- and program-specific	Observed mid- to high-60s (e.g., ~68%) in 2024–2025 presales; program-specific
Tenant Assessment	Credit; diversification; renewal likelihood; contract granularity/ churn	Large-exposure (>3%): Monte Carlo default simulation; unrated tenants assumed B1–Caa1; small-exposure: revenue haircut; zero-revenue period post-default[7]	Tenant type, diversity, recontracting risk	Credit; diversification; industry concentration; renewal likelihood	Weighted credit mix; lease roll; concentration; renewal likelihood
Portfolio Assessment	Asset quality; market concentration; market supply/demand	Data center grouping (1–5) drives volatility and growth caps; portfolio ABR correlation applied[8]	Tenant type, diversity, re-contracting risk	Asset quality; market concentration; market supply/demand	Asset quality; market concentration; market supply/demand
Structural Triggers	ARD step-ups; hyper-amortization	LTV tests; DSCR tests (<1.20x amortization, <1.35x cash trap; deal-specific); early-amortization events	LTV tests, amortization, liquidation triggers	DSCR/LTV tests; ARD cash sweeps; early amortization	Coverage tests; extension conditions
Collateral Diversity Requirements	Evaluated per utility score methodology	EUL and site-lease term modeled; renewal probability deal-specific; ground/airspace leases assumed lower renewal than tenant leases[9]	Transaction-specific	Multi-property; geographic spread preferred	Property- and portfolio-level analysis

*Morningstar DBRS and Fitch apply unified criteria across CMBS and ABS; table entries reflect observed presales and criteria summaries, not prescriptive policy. S&P utility score example: SF ABS Issuer LLC (Series 2025-1)—Presale cites a weighted-average portfolio utility score used in analysis (observed in presales; not policy).

Moody's Methodology Footnotes:

[4] Moody's Ratings, "Rating Methodology: Data Center Securitizations" (Feb. 6, 2025), p. 13.

[5] Moody's Ratings, "HYPER 2025-1: Presale—DataBank's inaugural hyperscale data center ABS issuance" (Sept. 8, 2025). Class A notes rated (P)A3(sf) with Moody's Leverage of 11.9x, Moody's DSCR of 1.32x, and initial LTV of 65.8%. CLTV defined net of liquidity reserve in presales.

[6] Simulated ABR change parameters: 25% floor, 2%/year growth cap per methodology.

[7] HYPER 2025-1 specifics: large-exposure threshold >3% of pool; small-exposure haircut = default share of churn (e.g., 1.25% = 25% default × 5% churn); zero-revenue period 12–18 months.

[8] Methodology bands: volatility ~5–23% and growth caps ~175% to ~20% by group; ABR correlation ~45% among data center assets.

[9] HYPER 2025-1: EUL ~32–34 years; tenant renewal probability ~75%; ground/airspace lease renewal typically ~20%.

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Note on ABS Collateral: In ABS structures, equity in operating entities, cash flows, mortgages on real property, and assignment of leases are pledged. In CMBS, mortgages on real property, assignment of leases, and associated cash flows are pledged. This distinction affects recovery analysis and bondholder remedies.

Moody's Revenue Simulation: Moody's uses a probabilistic simulation to project annualized base rent after initial leases expire or tenants default, assuming 0% drift and applying volatility factors calibrated to each data center's group classification.

Liquidity Reserves: Most data center securitizations include liquidity reserves. For 'AAAsf' notes without servicer advancing, Fitch: ~12 months of liquidity; other classes typically range 6–12 months, program/deal-specific. Moody's analyzes whether available liquidity support is sufficient to cover senior transaction expenses, timely interest payments, and unanticipated capex spikes—taking into account the credit quality of any advancing party but not modeling advances directly "because it is difficult to determine whether an advance is recoverable." These reserves provide a buffer during tenant transitions, unexpected equipment failures, or market disruptions. Reserve sizing varies by tenant concentration—single-tenant hyperscale deals may require larger reserves given the binary nature of the income stream.

4.D. Key Differences: Why Comparisons Can Mislead

Understanding the structural differences between CMBS and ABS is essential for interpreting rating agency metrics correctly:

Structural differences between CMBS and ABS

Dimension	CMBS	ABS (Colocation)
Cap Rate Role	Determines current value for leverage sizing	Determines terminal value at ARD for re-finance analysis or residual value at legal final
What's Pledged	Mortgage on real property; associated cash flows; assignment of leases	Equity in operating company; cash flows; mortgages on real property; assignment of leases
LTV Context	Traditional mortgage LTV; varies by rating level	Master trust construct; Max LTV is rating- and program-specific, not universal
Growth Flexibility	Fixed collateral pool (REMIC rules)	Can add assets meeting criteria; VFNs enable revolving draws
Typical Property Type	Hyperscale; wholesale colocation	Hyperscale; wholesale; retail colocation; multi-property portfolios
Number of Assets	Single-asset or portfolio	Single-asset or portfolio

Illustrative monitoring thresholds; actual triggers vary by deal and agency.

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Key Rating Drivers

Power Security emerges as the paramount consideration across all agencies, though each emphasizes different aspects. Executed utility agreements with defined capacity and delivery timelines provide the foundation for any investment-grade rating. Backup power redundancy must meet minimum standards—commonly N+1 for hyperscale power systems, with 2N deployed in select environments or for specific subsystems/rooms—supported by sufficient on-site fuel capacity and refueling arrangements. Long-term power purchase agreements, particularly those incorporating renewable energy, can enhance ratings by providing cost certainty and addressing ESG concerns.

Tenant Quality Assessment goes beyond simple credit ratings to examine the strategic importance of each facility to its tenant. Agencies may assess "dark value" as a sensitivity (e.g., a large-tenant vacancy at lease expiry), but CMBS sizing is driven primarily by sustainable NCF, market depth/lease rollover, re-tenanting time and costs, and required capex. For hyperscale properties, agencies also consider the facility's role in the tenant's network architecture and the presence of proprietary equipment that would be costly to relocate. Colocation properties require a detailed analysis of tenant diversification, with agencies stress-testing scenarios in which multiple tenants vacate simultaneously. Note that agencies do not apply a "look-through" credit enhancement in the manner sometimes assumed—tenant quality informs NCF projections and renewal assumptions rather than providing direct rating uplift.

Equipment Age and Condition have become increasingly critical as technological change accelerates. Properties with average MEP system ages exceeding seven years face heightened scrutiny, whereas those over 10 years may struggle to achieve investment-grade ratings without a committed capital improvement program. The shift toward liquid cooling for AI workloads has introduced additional complexity, with agencies evaluating not only current specifications but also the feasibility and cost of future upgrades. Agencies account for this risk by deducting elevated capex from NOI.

Recovery Value and Alternative Use constitute distinct risk factors for data center securitizations. Unlike industrial warehouses that can be repurposed for logistics, data centers are purpose-built facilities with limited alternative uses. Agencies account for this risk by: (1) applying conservative terminal cap rates, (2) stress-testing prolonged vacancy scenarios, and (3) evaluating whether the facility's specifications (power density, cooling, connectivity) are sufficiently current to attract a replacement tenant at market rents. Older or less well-located facilities face steeper recovery value haircuts.

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Surveillance Triggers

Once transactions close, agencies monitor specific metrics that can trigger rating actions:

Surveillance Triggers

Metric	Yellow Flag	Red Flag
Occupancy / Utilization (MW)	<85%	<75%
DSCR	<1.25x	<1.15x
Debt Yield	<9%	<8%
Lease Roll	>30% in 24 months	>40% in 12 months
Power Utilization	<60%	<50%
Equipment Age	>7 years average	>10 years average

Illustrative monitoring thresholds; actual triggers vary by deal, agency, and structure.
Clarification: The <85% / <75% thresholds refer to % of MW sold or metered utilization, unless otherwise noted.

Note on Occupancy Metrics: Traditional physical occupancy is increasingly less relevant for data centers. Industry participants and rating agencies now primarily track capacity as a percentage of megawatts sold and/or megawatts utilized. In colocation space, occupancy tends to be bimodal—facilities are often either near 100% occupied or significantly lower (~65%), potentially reflecting quality, age, market strength, or pricing factors. Agencies also examine whether landlords are 'overselling' capacity (e.g., selling 120 MW knowing the tenant will only utilize 75 MW), particularly in retail colocation.

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PART 5
Risks and Reality Checks

The Bubble Question

The sustainability of current growth rates deserves serious scrutiny. OpenAI's trillion-dollar ambitions would require funding of roughly $800 billion after partner contributions—more than four times what the entire dot-com era raised through technology IPOs and roughly equivalent to four years of total U.S. private-equity fundraising (earlier net-funding estimate; Sam Altman, the CEO of OpenAI, later referenced ~$1.4 trillion of commitments over eight years). While the comparison may not be entirely apt given different market conditions and funding sources, the sheer scale gives pause.

Market vulnerability indicators

Risk Factor	Current Status	Warning Level	Mitigation
Tenant Concentration	Top 5 = 73% of demand	High	Diversification into enterprise
Power Availability	3–5 year queues	Critical	On-site generation, nuclear deals
Construction Pipeline	2,000 MW quarterly	Elevated	Pre-lease requirements
Equipment Lead Times	52–100 weeks	Critical	Early procurement, inventory
Obsolescence Risk	30% of inventory at risk	Moderate	Retrofit planning
Environmental Pressure	Growing scrutiny	Moderate	Renewable PPAs

Source: Various

Systemic Risk Mapping: In January 2026, Moody's published an analysis mapping potential "contagion channels" if AI-related valuations dropped 40%. Key transmission mechanisms include:

- **Private credit:** Managers would need to renegotiate terms to avoid defaults and pause new deployment; redemptions from open-ended vehicles could hit withdrawal limits and trigger suspensions
- **Pension funds:** Passive exposure to AI-linked equities creates drawdown risk
- **Insurers:** Potential litigation exposure from AI-related losses
- **Consumer spending:** Wealth effects from equity market declines could reduce discretionary consumption

While Moody's stops short of declaring a bubble, the analysis underscores interconnected risks across public and private markets that CRE professionals should monitor.

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Regulatory Attention Rising: On January 22, 2026, Senator Elizabeth Warren and three Senate Democrats sent a letter to Treasury Secretary Scott Bessent requesting the Financial Stability Oversight Council (FSOC) probe "complex and opaque" data center financing structures. The letter specifically cited the Blue Owl/PIMCO financing of Meta's Hyperion project and warned that "AI companies unable to rapidly increase revenues and service their massive debt loads could cause destabilizing losses for an interconnected set of financial institutions."

The Power Reality

Analysis of U.S. data center power demand reveals the magnitude of the challenge ahead. Under Bank of America's base-case scenario, demand grows from 220 terawatt-hours in 2025 to 322 terawatt-hours by 2030—manageable with significant but achievable grid investments. The high-case scenario, reaching 500 terawatt-hours by 2030, would require an extensive infrastructure build-out that may not be feasible given permitting, equipment, and labor constraints. Even the low-case scenario of 280 terawatt-hours assumes substantial efficiency gains that may prove optimistic given the power intensity of AI workloads.

Creative solutions emerging:

- **Nuclear development:** 15+ small modular reactor (SMR) projects in development. Treat SMRs as long-term: on current timelines, they're unlikely to be available before 2029–2030 for data-center use.
- **Grid-independent campuses:** On-site gas turbines with carbon capture offering nearer-term solutions at higher cost.
  - *Example: In Memphis, one AI developer used temporary gas generators while waiting for air permits—permits and local community concerns can delay on-site power, so lenders should underwrite that risk.*
- **International arbitrage:** Development in Canada and Mexico to serve U.S. demand, though data sovereignty issues complicate.

Paradoxically, power constraints provide a near-term mitigant against obsolescence risk. With grid interconnection queues and substation lead times now the pacing item in several U.S. hubs, existing facilities with secured power enjoy a scarcity premium that newer, better-specified projects cannot immediately displace.

Technology Disruption Scenarios

Three technological shifts could fundamentally alter market dynamics. The liquid cooling transition, already underway, enables ten times the power density of traditional air cooling but renders much existing infrastructure obsolete. Retrofit costs of $50–100 million per 10-MW facility create a challenging economic equation for older properties. Quantum computing is a longer-dated possibility; today, it is not an investable underwriting factor. However, most experts expect complementary rather than replacement dynamics. Edge computing proliferation continues to accelerate, distributing processing closer to users and potentially reducing demand on centralized data centers while creating new facility types in urban locations.

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PART 6
Strategic Considerations for CRE Professionals

For Lenders

Underwriting data centers requires a fundamental shift in perspective from traditional real estate analysis. Power must take precedence over traditional property considerations—verified utility agreements with defined capacity and delivery schedules provide the foundation for any credible underwriting. Backup power redundancy must be stress-tested during extended outages, as the 2021 Texas freeze demonstrated that a 48-hour backup may not be sufficient. Expansion rights secured through options or utility commitments can significantly enhance collateral value, particularly in power-constrained markets.

Tenant and operator quality assessment extends beyond credit ratings to operational capabilities. Track records of 99.99% or better uptime—the industry standard of less than 53 minutes of downtime annually—separate tier-one operators from aspirants. Financial capacity for ongoing upgrades matters as much as current asset quality, given the rapid pace of technological change. Relationships with hyperscale tenants provide not only current income but also market intelligence on future requirements and investment priorities.

Key structural protections gaining market acceptance:

- Cash-flow sweeps triggered when debt yields fall below 8–9%
- Replacement reserves commonly $3–$8/kW/month
- ARD step-ups and hyper-amortization triggers
- VFN sub-limits controlling revolving capacity
- Major lease approval rights to prevent adverse selection
- Minimum rating requirements for tenant substitution
- Utility confirmation letters with capacity/delivery milestones

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For Investors

Value creation strategies in data centers span the risk-return spectrum:

Value creation strategies

Strategy	Risk Level	Target Returns	Capital Required	Time Horizon
Core Stabilized	Low	7–9%	$100M+	7–10 years
Development JV	High	15–20%	$50M+	3–5 years
Value-Add Retrofit	Moderate	12–15%	$30M+	2–3 years
OpCo Platforms	Moderate	10–15%	$200M+	5–7 years
Power Infrastructure	Low-Moderate	8–12%	$100M+	10–15 years

Source: Various

Market entry considerations reflect the sector's complexity and rapid evolution. Partnering with established operators for initial investments provides essential learning opportunities while reducing execution risk. Focusing on power-secured opportunities—those with executed utility agreements and defined delivery schedules—eliminates the primary development risk. Geographic diversification beyond the top five markets can unlock attractive opportunities with less competition, though it requires careful analysis of local power grids and fiber infrastructure.

For Developers

The development equation has fundamentally changed from traditional real estate approaches. The historical sequence of finding land, designing buildings, seeking tenants, and then arranging power no longer works. Today's requirement begins with securing power through utility agreements or on-site generation commitments. Only with power secured can developers credibly approach anchor tenants, whose commitments then enable land acquisition at prices justified by the revenue certainty.

Critical success factors now emphasize capabilities traditionally outside real estate expertise:

- Power procurement expertise (now more valuable than construction experience)
- Hyperscaler relationships (ideally MSAs with 2+ major cloud providers)
- Patient capital (willing to accept 3–5 year development cycles)
- Equipment procurement advantages (reserved capacity with manufacturers)

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PART 7

Looking Forward

2026 Outlook

The trajectory for 2026 appears increasingly clear as hyperscalers commit to large-scale infrastructure investments. Recent sell-side estimates project ~$602 billion in 2026 capex for the top five U.S. hyperscalers—a 36% increase over 2025—with ~75% (~$450 billion) directed toward AI infrastructure. CreditSights projects capital intensity reaching historically unprecedented levels of 45–57% of revenue for some hyperscalers. This spending increasingly relies on creative financing structures, with Morgan Stanley estimating $800 billion in asset-level and special-purpose-vehicle financing needs by 2028. Morgan Stanley projects ~$28 billion in U.S. net issuance in 2026, with an additional $5.5 billion in refinancings, for a total of ~$33.5 billion in gross issuance. For 2026–28, Morgan Stanley estimates ~$130 billion in U.S. data-center securitized-credit net issuance (ABS + CMBS) and ~$15 billion in European securitized credit issuance. ABS is expected to capture ~75% of U.S. supply.

The composition of this spending is shifting toward shorter-lived assets (servers, GPUs, networking) rather than building shells, reflecting the rapid pace of technological change. Meta expects a greater mix of its 2025–2026 capex in these categories, while Microsoft's future finance leases not yet commenced for data centers stood at ~$108 billion at year-end 2024, up from ~$26 billion two years earlier. Oracle's aggressive expansion plans could push its debt levels past $100 billion as it races to meet remaining performance obligations that have surged with AI demand.

Investors flag deal comparability and potential asset-quality creep as master trusts expand; mitigants include rating-agency guardrails and sponsors employing multiple trusts to preserve profiles. As the market matures, expect early high DSCR/low LTV cushions to normalize.

Long-Term Structural Questions

Three debates will shape the industry's long-term structure:

1. **Will hyperscalers disintermediate landlords?**

While more self-development by tech giants seems likely, capital constraints suggest third-party capital will remain essential. The potential outcome points to a hybrid model in which hyperscalers develop strategic facilities while relying on partners for geographic expansion.

2. **Can secondary markets handle hyperscale demand?**

Markets like Columbus and Reno have demonstrated viability. Still, questions persist about their ability to provide the complete ecosystem—skilled workforce, robust fiber networks, and supply chain support—that hyperscale operations require.

3. **Will AI efficiency reduce infrastructure needs?**

Model efficiency is doubling annually, but use cases are expanding faster than efficiency improves. The reality likely encompasses both dynamics, with efficiency gains moderating but not eliminating growth in infrastructure demand.

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Key Metrics to Monitor

Monthly/Quarterly indicators:

- Power utility queue reports by region
- Equipment manufacturer lead times
- Hyperscaler capital expenditure guidance
- Securitization spreads versus corporates
- Sublease availability in major markets

Annual benchmarks:

- Cost per MW of development
- Average PUE
- Renewal rates by property type
- Geographic shift in development activity
- Sustainability metrics and carbon intensity

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CONCLUSION

Data centers are a rapidly evolving segment of CRE, offering opportunities for those who understand their unique characteristics. While the current growth trajectory may not be sustainable indefinitely, many market participants expect fundamental demand for digital infrastructure to remain elevated as the economy becomes increasingly data-dependent.

Five key takeaways for CRE professionals:

1. **Power is the new location** – Success depends more on electrical infrastructure than traditional real estate fundamentals like demographics or traffic patterns

2. **The tenant base is concentrated but creditworthy** – Five companies drive 73% of demand, but these tenants are among the world's strongest credits with ratings from BBB+ to AAA

3. **Financing structures have matured rapidly** – The market has evolved from experimental to institutional in just five years, with standardized documentation and established investor bases

4. **Geographic dynamics remain fluid** – Today's hot market can become tomorrow's power-constrained zone as demand overwhelms local infrastructure

5. **Technology risk is real but manageable** – Partner with sophisticated operators who can navigate the ongoing evolution from air to liquid cooling and beyond

Potential advantages include: data centers offer higher yields than traditional property types, longer lease terms than most CRE, and exposure to the structural growth of the digital economy. But success requires understanding that these aren't just buildings—they are power-intensive facilities with operational characteristics distinct from traditional CRE.

Key risks include: this is a capital-intensive, technically complex sector with meaningful obsolescence risk that can render today's state-of-the-art facility tomorrow's stranded asset.

For those ready to engage, the path forward begins with stabilized, leased assets that provide learning opportunities with controlled risk. Partnering with experienced operators provides essential expertise while building internal capabilities. Focusing relentlessly on power security—the sector's fundamental constraint—helps avoid the primary pitfall that has derailed numerous projects. And perhaps most importantly, recognizing that in data centers, development cycles are multi-year, and equipment/cooling standards evolve frequently.

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KEY TERMS AND DEFINITIONS

AANOI – Annualized Adjusted Net Operating Income (used in ABS sizing)

ARD – Anticipated Repayment Date; the expected take-out/refinance date in ABS

Colocation – Multi-tenant data center where companies rent space for their servers, similar to a multi-tenant office building but with power rather than square footage as the primary pricing metric

Edge Data Center – Smaller facilities typically ranging from 1–5 MW, located close to population centers to reduce latency for real-time applications

Electric rate plan (tariff) – The utility's published pricing and billing rules for your site

Gigawatt (GW) – One billion watts of power; for context, a large nuclear plant generates about 1 gigawatt, enough to power roughly 750,000 homes

Hyperscale – Massive data centers of 40 MW or more, purpose-built for and leased to single tenants like Amazon Web Services or Microsoft

KEGI – KBRA Effective Gross Income

Kilowatt (kW) – One thousand watts; the basic unit for pricing data center capacity, with monthly rates typically ranging from $100 to $400

KNCF – KBRA Net Cash Flow; KBRA's standardized cash-flow measure

Latency – Time delay in data transmission measured in milliseconds; critical for real-time applications like video gaming or financial trading

Meet-Me Room (MMR) – Secure space where multiple network carriers interconnect, allowing tenants to connect directly to various service providers

Megawatt (MW) – One million watts; a 10-MW data center is considered medium-sized in today's market

MEP – Mechanical, Electrical, and Plumbing systems; the critical infrastructure that distinguishes data centers from traditional real estate

PJM Interconnection – The regional transmission organization operating the largest power grid in North America, covering 13 states and Washington, D.C. (from Illinois to New Jersey, south to Virginia). Northern Virginia, the world's largest data center market, sits within PJM, making its capacity auctions and interconnection queues critical benchmarks for the sector.

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Power Density – kW per rack or per square foot of raised floor. AI clusters now exceed 100 kW/rack vs. 10–15 kW traditional

Power Purchase Agreement (PPA) – Long-term contract for electricity, often from renewable sources, providing cost certainty and sustainability benefits

Power Usage Effectiveness (PUE) – Total facility power divided by IT equipment power; 1.2 is excellent, 2.0 is poor, with newer facilities targeting below 1.5

Redundancy Levels – Standardized hierarchy of backup systems from N (no redundancy) through 2N+1 (duplicate systems plus spare)

Switchgear – Equipment that controls and protects electrical power distribution; critical for managing the massive electrical loads in data centers

Tier Classifications – Industry standard from the Uptime Institute rating reliability from Tier I (99.67% uptime) to Tier IV (99.995% uptime)

Uninterruptible Power Supply (UPS) – Battery system providing instant backup power during the crucial seconds before generators start

VFN – Variable Funding Note; revolving note used in some ABS master trusts

Weighted Average Lease Term (WALT) – Average remaining lease term weighted by revenue contribution; key metric for assessing income stability

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ABOUT THIS PRIMER

The CRE Finance Council prepared this primer to help members understand the rapidly evolving data center sector. This primer is educational, not investment advice; it reflects conditions as of January 2026 and public sources listed herein.

CREFC is the trade association for the CRE finance industry, representing banks, insurance companies, asset managers, and other institutions engaged in commercial mortgage lending and securitization.

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