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Your success is our success

Anant Raj Limited

Pressing the
pedal on growth

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Your success is our success

TARGET PRICE (Rs): 925

We initiate coverage on Anant Raj (ARL) with BUY and SoTP-based TP of Rs925 (37% upside). ARL has garnered a strong brand name as a reputed real estate developer in the NCR market, over the last 5 decades. A comfortable launch pipeline (availability of low-cost land bank and scope to accumulate more) would drive bookings/collections CAGR of 18%/39%, respectively, during FY24-27E, generating a healthy cashflow stream. This, coupled with a deleveraged balance sheet and likely fund-raise of Rs20bn, would pave the way for a sharp ramp up of the company's Data Center (DC) business. Availability of land/civil structures gives competitive advantage and would aid faster capacity addition (expected @102MW by FY27E; 6MW, as of Q2FY25). Rise in share of cloud-based services would further boost profitability. EBITDA/PAT of the DC business is likely to sharply increase to Rs6.5bn/Rs3bn by FY27E (nil in FY24). Overall, we expect ~21% IRR for the DC business (up to FY45E).

Target Price – 12M	Dec-25
Change in TP (%)	**NA**
Current Reco.	BUY
Previous Reco.	NA
Upside/(Downside) (%)	37.1
CMP (29-Nov-24) (Rs)	675.0

Stock Data	**Ticker**
52-week High (Rs)	796
52-week Low (Rs)	255
Shares outstanding (mn)	341.9
Market-cap (Rs bn)	231
Market-cap (USD mn)	2,731
Net-debt, FY25E (Rs mn)	3,100
ADTV-3M (mn shares)	2
ADTV-3M (Rs mn)	1,043.1
ADTV-3M (USD mn)	12.3
Free float (%)	-
Nifty-50	24,131
INR/USD	84.5
Shareholding, Sep-24	
Promoters (%)	60.0
FPIs/MFs (%)	13.0/6.7

Anant Raj: Financial Snapshot (Consolidated)

Y/E Mar (Rs mn)	FY23	FY24	FY25E	FY26E	FY27E
Revenue	9,569	14,833	18,981	22,578	29,955
EBITDA	1,971	3,338	4,985	7,152	11,658
Adj. PAT	1,511	2,659	3,408	4,099	6,546
Adj. EPS (Rs)	4.4	7.8	10.0	12.0	19.1
EBITDA margin (%)	20.6	22.5	26.3	31.7	38.9
EBITDA growth (%)	159.7	69.4	49.3	43.5	63.0
Adj. EPS growth (%)	175.3	76.0	28.2	20.3	59.7
RoE (%)	5.5	8.2	8.9	9.8	13.8
RoIC (%)	5.5	8.8	11.4	12.4	16.5
P/E (x)	152.7	86.8	67.7	56.3	35.3
EV/EBITDA (x)	122.2	70.0	46.9	33.3	21.0
P/B (x)	8.2	6.3	5.8	5.2	4.6
FCFF yield (%)	(0.5)	(0.1)	0.0	(1.8)	(2.5)

Source: Company, Emkay Research

Price Performance

(%)	1M	3M	12M
Absolute	(1.2)	12.5	160.0
Rel. to Nifty	0.2	17.2	116.5

1-Year share price trend (Rs)

Low-cost land bank and scope to add more land offer good launch visibility
ARL has 220 acres of land parcels in total, at Golf Course Extension Road (Sector 63A); a significant (~120 acres) portion of this has yet to be developed and sold (comprises ongoing and planned projects). Also, it has ~101 acres of land bank in Delhi which could have development potential of ~12msf (depends on the Master Plan; current potential @6msf). Further, the balance 20 acres in Sector 63A, the scope to acquire 30 acres of land in GCER, and plan to explore projects on JD basis with land owners in the NCR region grant comfort on the launch visibility over the medium term.

Residential bookings/collections to see 18%/39% CAGR over FY24-27E
A launch pipeline of ~Rs70bn has already been planned, and land availability offers GDV potential of an additional Rs100bn, to be planned in Sector 63A. Further, the ~101-acre land bank in Delhi and scope to add ~50 acres of land in Sector 63A (20 acres already acquired) would improve launch visibility. We expect residential sales to log CAGR of 18%, at Rs46bn, which would drive collections CAGR of 39% to Rs26.3bn, during FY24-27E, and lead to a strong cash-flow stream for the company.

Making it big in the high-growth data center and cloud space
ARL plans to rapidly scale up its data-center business, with capacity likely to increase to 307MW in the next 4-5 years (made foray in FY23; currently, 6MW operational capacity). This would comprise 25%/75% share of cloud/co-location services, respectively. We expect multifold growth in this segment, mainly led by surge in digital adoption, 5G expansion, Optic Fiber network augmentation, and government focus on data protection. Revenue from the DC business is likely to increase to Rs8.5bn by FY27E (nil, as of FY24). Access to land and ready-made civil structures position the company well for cost and time advantage over peers. Profitability is higher and ranges @75-80% EBITDAM that bodes well for robust consolidated PAT growth and strong OCF generation.

DCs to drive revenue growth; expect earning CAGR of 35% over FY24-27E
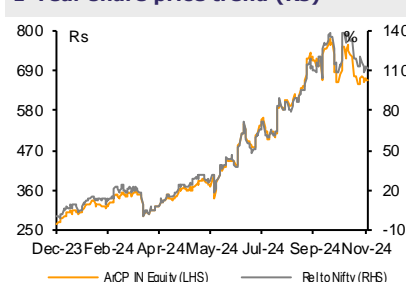Factoring in assumptions regarding i) capacity addition, ii) rentals, iii) proportion between colocation-cloud, and iv) capacity utilization levels, we build in DC business revenue of Rs324mn/Rs3bn/Rs8.5bn for FY25E/FY26E/FY27E, respectively. We project DC business margin as remaining rangebound at 75-80% across the related data center's life. ARL's DC business, when discounted at 12.4% WACC (We/Wd: 80/20), culminates into 21% IRR, in the base case scenario. We believe the equity value likely to be generated from the DC business is ~Rs167bn, which translates into Rs501/sh for investors. The real-estate business is likely to witness strong cash inflow on the back of collections seeing 39% CAGR over FY24-27E which would fund the growth in data centers. ARL's real-estate business is expected to contribute Rs436/sh to the TP. We initiate coverage on ARL with BUY and SoTP-based TP of Rs925 (37% upside).

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Investment Rationale

Residential business to witness sustainable scale up

Anant Raj has availability of a significant ~120 acres of land parcels in the high-growth Sector 63A, Gurugram (including the recently acquired 20 acres), apart from almost 101 acres in Delhi, for which development is being planned. Significant portion of this land bank has come at a lower cost as the acquisition panned over a few years. Anant Raj's current land parcels lend comfort on the launch pipeline over the medium term and, accordingly, we expect residential sales CAGR of 18% to Rs46bn during FY24-27E. Additionally, the company has scope to add another 30 acres in Sector 63A as well as explore joint development opportunities in the core markets which bodes well for sustaining growth beyond FY27E.

Focus on core operations has rejuvenated post-demerger of TARC (erstwhile Anant Raj Global) and the successful QIP of Rs5bn in FY24 which led to the balance sheet having significantly deleveraged in the past 2-3 years. Further, improvement in collections from the residential business (39% CAGR to Rs26.3bn during FY24-27E) would cause further reduction in debt levels which would enable faster scale up of the Data Center (DC) business, apart from sustaining growth momentum in the residential business.

Anant Raj (ARL), a renowned and seasoned player in the real estate business, has chalked out aggressive plans in the data center and cloud spaces. At present, ARL has 6MW (Location: Manesar) operational DC capacity, and is progressing well for commissioning an incremental 22MW by the end of FY25E. We believe the company is well placed to reap benefits, primarily because of 1) its strong land bank position leading to relatively lower cost incurred for setting up DCs, 2) positioning itself to provide cloud services on the back of strategic tie-ups made over the last 2 years, 3) Delhi-NCR as a region is an upcoming DC hub, and can cater to the North region DC demand going ahead. Softer aspects (people and processes) have been considered by the management in setting up this business. The experienced set of personnel on-boarded by the management provides assurance regarding management direction and focus on building this business. With front-loading of DC and cloud capex, the management has decided to optimize its financial allocations by i) utilizing cash flow worth ~Rs29bn generated from the real estate business over FY25-27E ii) issuing QIP worth ~Rs20bn.

Exhibit 1: Anant Raj – Valuations

(Rs mn)	NAV	Comment	Overall value	Per share (Rs)
Residential NAV (on FY25E)	63,816	100% premium on NAV considering the growth visibility	127,632	373
Total residential			**127,632**	**373**
Commercial		4% Terminal growth 8.5% Cap rate	21,461	63
Data Centers				
Total EV - Residential and Commercial (ex data centers)			**149,093**	**436**
EV - Data centers			**171,402**	**501**
Less: Net debt			4,131	12
Equity Value			**316,364**	**925**

Source: Company, Emkay Research

Exhibit 2: Anant Raj - Emkay Estimates

Particulars	FY24	FY25E	FY26E	FY27E	FY24-27E CAGR
	Actual	Introducing	Introducing	Introducing	
Revenue (Rs mn)	14,833	18,981	22,578	29,955	26.4%
EBITDA (Rs mn)	3,338	4,985	7,152	11,658	51.7%
EBITDA Margin	22.5%	26.3%	31.7%	38.9%	1,641bps
PAT (Rs mn)	2,659	3,408	4,099	6,546	35.0%
EPS (Rs)	7.8	10.0	12.0	19.1	35.0%
PER (x)	86.8	67.7	56.3	35.3	

Source: Emkay Research

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Anant Raj – Real Estate Business

Residential business to witness sustainable scale up

Anant Raj has availability of a significant ~120 acres of land parcels in the high-growth Sector 63A, Gurugram (including the recently acquired 20 acres), apart from almost 101 acres in Delhi, for which development is being planned. Significant portion of this land bank has come at a lower cost as the acquisition panned over a few years. Anant Raj's current land parcels lend comfort on the launch pipeline over the medium term and, accordingly, we expect residential sales CAGR of 18% to Rs46bn during FY24-27E. Additionally, the company has scope to add another 30 acres in Sector 63A as well as explore joint development opportunities in the core markets which bodes well for sustaining growth beyond FY27E.

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Golf Course Extension Road emerging as hotspot in high-growth Gurugram housing market in NCR

NCR has emerged as one of the top-performing residential markets, witnessing continuity in demand momentum as it clocked a decadal high in CY23, given that homebuyers continued to purchase newly-launched residential units from developers with a good brand image. In the aftermath of Covid as well as following RERA implementation, buyer confidence on timely delivery of new projects has rejuvenated, to some extent.

Gurugram accounts for the highest share (of 59%) in NCR's total launches, in H1CY24

Infrastructure upgrades, enhanced connectivity, and growing homebuyer appetite in Gurugram's high-end projects have led to several new launches in this micro-market. Other leading micro-markets attracting launches in NCR are Greater Noida @23%, followed by Delhi (9%), Ghaziabad (5%), Noida (2%), and Faridabad (2%). Further, among the key clusters in the high-traction Gurugram market, Golf Course Extension Road (GCER) has established itself as a distinguished and premium real-estate micro market. The region features a mix of residential projects, including high-rise apartments, independent floors, plots, and villas.

Exhibit 3: Sales and launch trends in the NCR market
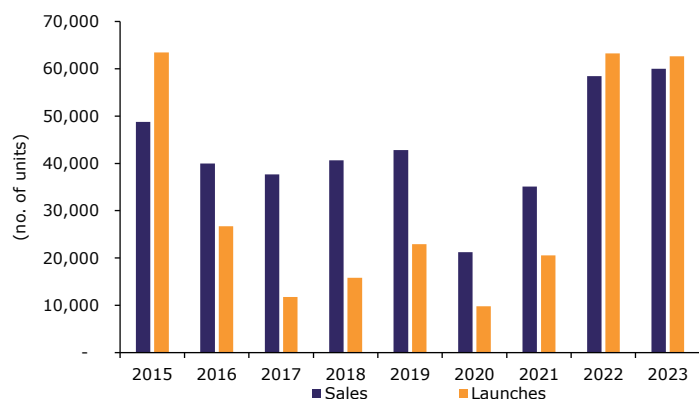
Source: Knight Frank, Emkay Research

Exhibit 4: Realization trend in the NCR market
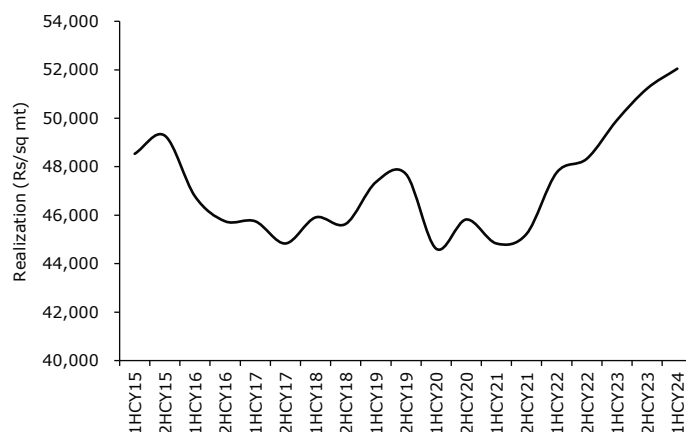
Source: Knight Frank, Emkay Research

During CY18-23, almost 3,702 apartments were launched in GCER, which also saw ~3,004 independent floors being launched in the micro-market. All units witnessed healthy absorption, with apartments absorption at ~99% and independent floors absorption levels at 96%. The micro-market has seen significant launches in the premium and luxury housing category during CY22/23, which saw customer preference pivoting toward these segments; this led to exceptional sales momentum.

Given the scarce land availability, new land is available at significantly higher prices which impacts the profitability of projects. However, developers like DLF, Anant Raj, etc that have historical land banks in the NCR market are well placed to capitalize on the dynamics of the residential sector.

Most of the housing supply addition in GCER during CY22/23 has been done mainly by seven developers, including DLF, Birla Estate, Emaar, Adani Realty, etc. Many of these newly launched projects received significant traction within a short period of launch, viz Emaar Urban Oasis and Puri Aravallis (Rs15,500-16,500/sqft) were sold out within the initial two weeks of launch, whereas launch of DLF The Arbour (Rs17,500-18,500/sqft), a luxury project, received robust response and was sold out within the first week of launch.

The strong absorption reflects buoyancy in this price range in the GCER real estate market, and a number of factors like location, connectivity, and amenities available in the area could be attributable to this. Presence of developers with an established brand name and strong demand (improved traction) have led to GCER market prices increasing to Rs18,000–22,000/sqft (Birla Avik). As per market feedback, the upward movement in prices is expected to continue, at least in the near term.

Exhibit 5: Gurugram – Key residential clusters

Cluster	Details
Golf Course Road	Golf Course Road is one of the established offices (commercial spaces), retail, and residential micro markets of Gurugram. The micro-market is connected via wide developed roads and Rapid Metro. The residential offering in the micro market primarily constitutes luxury and premium housing. **Sectors**: 26A, 27, 42, 43, 53, 54, 55, and 56.
Sohna Road	Sohna Road is one of the established offices (primarily IT/ITeS, and SEZ space), retail and residential micro markets of Gurugram. With improvement in connectivity and completion of infrastructure projects, the micro market is likely to gain prominence to the likes of other established micro markets of Gurugram. The residential offering in the micro market primarily constitutes premium and upper mid segment housing. **Sectors:** 33, 38, 47, 48, 49, and 68.
Golf Course Extension Road	The micro-market is the extended part of Golf Course Road and proves to be an alternative for the same owing to its proximity to CBD and Sohna road. The residential offering in the micro market primarily constitutes premium and upper mid segment housing. **Sectors:** 58, 59, 60, 61, 62, 63, 63A, 64, 65, 66, 67, and 67A.
Southern Peripheral Road	Southern Peripheral Road (SPR) is one of the developing micro markets of Gurugram. SPR, which is the main connecting road in this micro market, became operational in 2018. The residential offering in the micro market primarily constitutes upper mid segment housing. **Sectors:** 69, 70, 70A, 71, 72, 73, 74, 74A, 75, and 75A.
New Gurugram	New Gurugram is one the developing micro markets of Gurugram. The micro market gained prominence due to the launch of multiple low-ticket size integrated residential developments. However, currently, the micro market offers housing for all segments. **Sectors:** 76, 77, 78, 79, 79A, 79B, 80, 81, 81A, 82, 82A, 83, 84, 85, 86, 87, 89, 89A, 89B, 90, 91, 92, 93, 94, 95, 95A, and 95B.

Source: Company, Emkay Research

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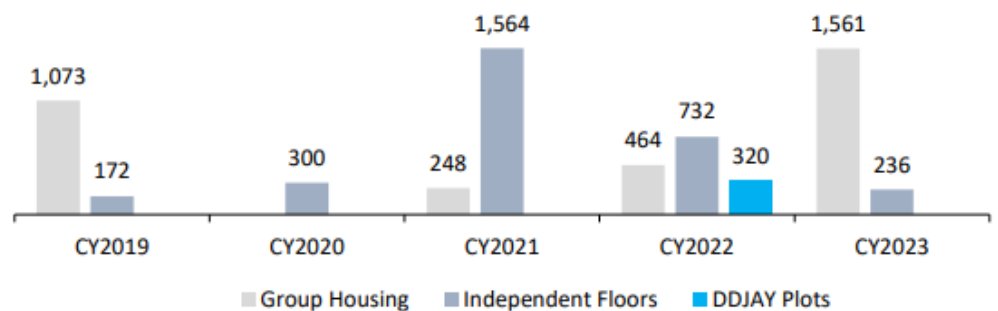
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Exhibit 6: Golf Course Extension Road (GCER) is next to Golf Course Road, and home to multiple developers like DLF, Anant Raj, Birla Estates, and Adani Realty
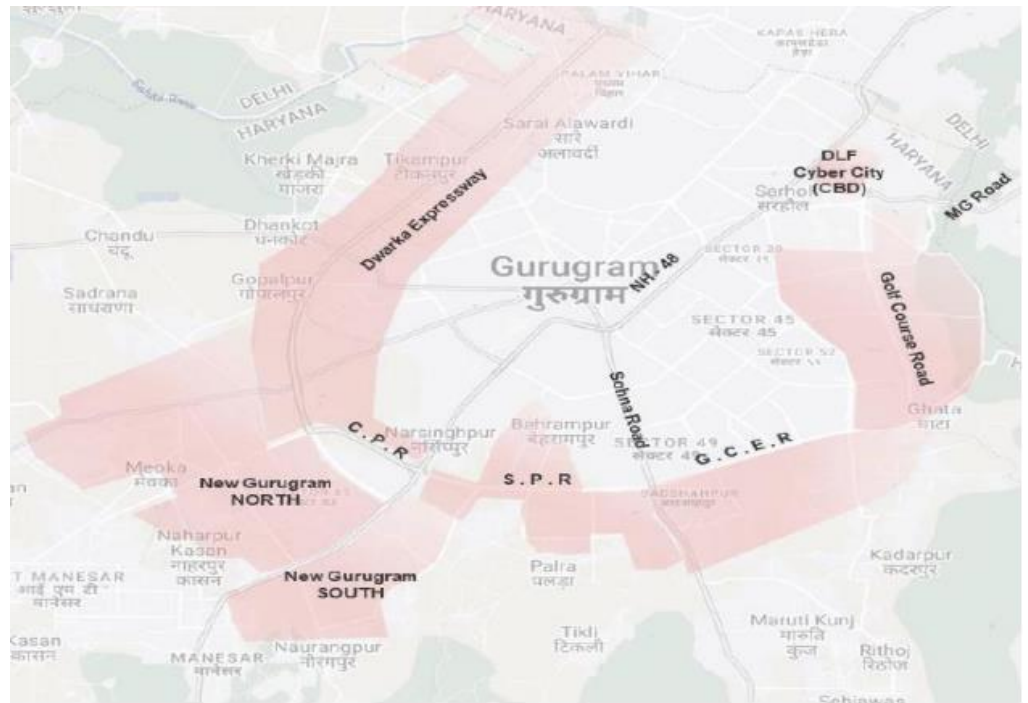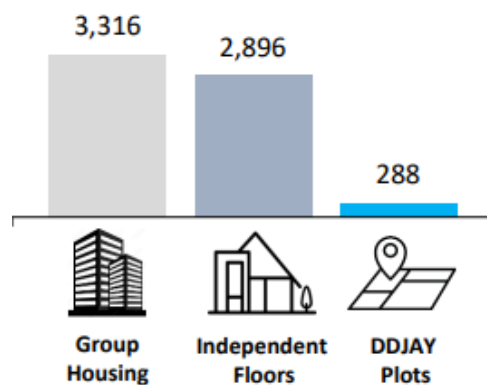

Source: Company, Emkay Research

Exhibit 7: Increasing demand driving new launches in the GCER property market

Source: Company, Emkay Research

Exhibit 8: Golf Course Extension Road – Previous project launches by key developers

Developer	Project name
Conscient & Hines	Elevate
M3M India	M3M Trump Towers, M3M Golf Estate, M3M Merlin, M3M Heights, M3M Skycity, M3M Latitude
Anant Raj	Estate Villas, Estate Floors, Executive Floors, Estate Plots, Premier Floors
Birla Estates	Birla Navya (JV with Anant Raj Estates)
Smartworld Developers	Smartworld Orchard
Mahindra Lifespaces	Luminaire
Ireo	Ireo Grand Arch, Ireo Uptown, Ireo Skyon, Ireo Corridors, Ireo Victory Valley
Pioneer	Presidia, Araya, Pioneer Park
TATA - Raheja	Raisina Residency
BPTP	BPTP Park Prime, BPTP Freedom park Life
Emaar	Digi Homes, Palm Enclave Palm Terrace, Premier Terraces, The Sky Terraces
Adani	Samsara Vilasa, Samsara Avasa

Source: Company, Emkay Research

Exhibit 9: Location of key projects in Golf Course Extension Road@
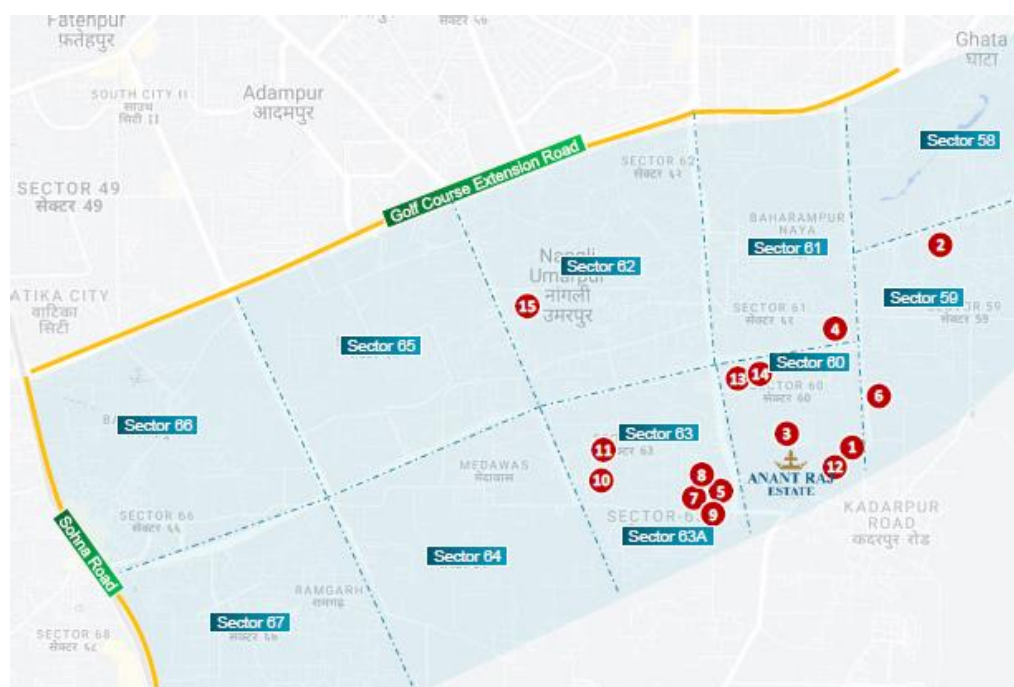
Source: Company, Emkay Research; Note: @ = Refer to Exhibit 10 for details

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Exhibit 10: Details of key projects launched in Golf Course Extension Road#

No.	Project name	Developer	Launch Date	Project Type	Units (nos.)	Launch Price (Rs/sqft)	Configuration
1	Birla Navya III (Drisha 1B)	Birla Estates	Apr-22	Independent Floors	44	14,100	3 BHK
2	Luminaire III (Tower B)	Mahindra Lifespaces	May-22	Apartment	140	13,500	3 BHK
3	Ashok Estate	Anant Raj	Jul-22	Residential Plots	320	Rs 175,000/sq yard	
4	The Aravallis	Puri Constructions	Jul-22	Apartment	324	15,550	3-4 BHK
5	Signature Global City 63 A Phase I	Signature Global	Jul-22	Independent Floors	140	13,650	2-3 BHK
6	Birla Navya (Anaika)	Birla Estates	Aug-22	Independent Floors	120	17,950	3-4 BHK
7	Signature Global City 63 A Phase II	Signature Global	Oct-22	Independent Floors	140	13,650	2-3 BHK
8	Signature Global City 63 A Phase III	Signature Global	Dec-22	Independent Floors	148	13,400	2-3 BHK
9	Signature Global City 63 A Phase IV	Signature Global	Dec-22	Independent Floors	140	13,400	2-3 BHK
10	Samsara Vilasa 2.0 (Samsara Arya)	Adani Realty	Jan-23	Independent Floors	60	12,500	3-4 BHK
11	DLF The Arbour	DLF	Feb-23	Apartment	1,137	18,000	3 BHK
12	Birla Navya (Avik) (Phase-1)	Birla Estates	Feb-23	Independent Floors	88	22,100	3-4 BHK
13	Samsara Avasa (P-I)	Adani Realty	Mar-23	Independent Floors	68	21,350	3 BHK
14	Samsara Avasa (P-II)	Adani Realty	Apr-23	Independent Floors	20	21,350	3 BHK
15	Urban Oasis	Emaar	May-23	Apartment	424	16,150	3-4 BHK

Source: Company, Emkay Research; Note: # = Depicted in the Exhibit 9 map

ARL has availability of a fully-paid, ~120-acre developable land bank in a premium location in Gurugram

Anant Raj has 220 acres of land parcels in total, at Golf Course Extension Road (Sector 63A) in Gurgaon; a significant (~120 acres) portion of this has yet to be developed and sold (comprises ongoing and planned projects). Of the balance land, 50 acres has already been sold and delivered by the company, whereas another 47 acres have been committed toward a 50:50 JV (ARL profit share @Rs10bn) with Birla Estates—a wholly-owned subsidiary of Aditya Birla Real Estate.

GCER is currently one of the premium and high-demand residential markets in NCR. ARL's entire land parcel has been fully paid up, and a significant portion of this has come at lower cost as the acquisition happened over a period of time. Of the ~120 acres, land parcels admeasuring 20 acres were recently added, for which development has yet to be planned; the balance ~100 acres (ongoing + planned) offer a development potential of ~9msf with gross development value (GDV) of ~Rs150-180bn.

This would comprise 3.2msf Group Housing, 4.7msf Villas/Floors/Plots (including 1.3msf DDJAY Plots), and 1.2msf Affordable Housing (plan as of Q2FY25). The Group Housing project would come up in three phases – Phase-1 has been launched and is fully sold out, having generating total booking value of Rs18bn (Rs18,000/sqft). The balance saleable inventory worth Rs130-160bn would drive bookings over the medium term.

Additionally, it has scope to add 30 acres land at this location which would lead to continuity of growth momentum in coming years.

Exhibit 11: Ongoing and future launches in Sector 63A, Gurugram

Project name	Type	Launch Date	Completion Date	Total Saleable Area	Estd GDV
				(msf)	(Rs bn)
Sector 63A, Gurugram - Residential (Ongoing)					
Ashok Estate	100% Owned	Jul-22	Dec-25	1.3	10.0
Avarna (Birla Navya) - all 4 phases*	50% JV	Mar-20	Dec-27	1.9	33.0
Anant Raj Estate GH-1	100% Owned	Jan-24	Jun-28	1.0	18.0
Sub-total				**4.2**	**61.0**
Sector 63A, Gurugram - Residential (Planned)					
Anant Raj Estate Floors 1	100% Owned	Jan-25	Oct-27	0.4	7.5
Anant Raj Estate Floors 2	100% Owned	Mar-25	Jan-28	0.4	7.5
Anant Raj Estate GH-2	100% Owned	Mar-25	Dec-28	1.1	21.0
Anant Raj Estate GH-3	100% Owned	Jul-25	Jun-29	1.1	25.0
Future Launch announcements	100% Owned			5.1	100.0
Sub-total				**8.1**	**161.0**
Grand Total				**12.3**	**222.0**

Source: Company, Emkay Research; Note: 1) GH = Group Housing; 2) Not considered any incremental land addition beyond 200 acres in Exhibit 11; 3) The company is likely to add 50 acres of land (~20 acres already acquired); 4) GDV is indicative of the entire project – ARL has 50% share

Distinguished advantage of its development history in Sector 63A to support future sales

Apart from Anant Raj, a number of large developers and developers with an established brand name—viz DLF, Adani Realty, Mahindra Lifespaces, Signature Global, TARC, Birla Estates (JV with Anant Raj), etc—have launched projects in Sector 63A. Presence of such developers has increased the appeal of Golf Course Extension Road as well as led to strong price appreciation in the past couple of years. However, only a few among these (ie Adani Realty, Anant Raj) have delivered a product, whereas most have launched projects only recently and are at the under-construction stage.

Anant Raj has a significant area that has already been developed and delivered to homebuyers in Sector 63A. This offers a ready display of quality of product for potential customers. Also, a significant area of the delivered product builds confidence among homebuyers, to purchase property still under construction by the developer in the same location. On the other hand, developers with a delivered product have either a small or nil launch pipeline in Sector 63A, giving Anant Raj a distinguished advantage of attracting homebuyer interest in upcoming launches.

GCER has been gaining increased homebuyer interest and supply in this micro-market as it has been carefully calibrated by leading developers which has led to housing prices seeing good cumulative appreciation of 70-80% in the past 3 years. This asset value appreciation has in turn kept the demand traction intact, enabling developers to monetize their inventory at a higher rate and a faster pace. We note launches that were earlier happening at Rs12,000-13,000/sqft are now seeing prices as high as Rs20,000/sqft, which would be beneficial for developers like Anant Raj who are carrying a historical land bank at low acquisition cost.

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Exhibit 12: ARL's projects already delivered in Sector 63A

Source: Emkay Research; Note: Photos are actual images taken at site – Estate Floors and Birla Navya (JV project with Birla Estates)

Exhibit 13: Projects launched in Sector 63A

No	Project name	Developer	Launch Date	Project Type	Units	Launch Price	Configuration
					(no of)	(Rs/sqft)	
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10	Samsara Vilasa 2.0 (Samsara Arya)	Adani Realty	Jan-23	Independent Floors	60	12,500	3-4 BHK
11	DLF The Arbour	DLF	Feb-23	Apartment	1,137	18,000	3 BHK
12	Birla Navya (Avik) (Phase-1)	Birla Estates	Feb-23	Independent Floors	88	22,100	3-4 BHK
13	Samsara Avasa (P-I)	Adani Realty	Mar-23	Independent Floors	68	21,350	3 BHK
14	Samsara Avasa (P-II)	Adani Realty	Apr-23	Independent Floors	20	21,350	3 BHK
15	Urban Oasis	Emaar	May-23	Apartment	424	16,150	3-4 BHK

Source: Company, Emkay Research

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Exhibit 14: Projects in close vicinity to Anant Raj in Sector 63A

Source: Emkay Research; Note: Photos are actual images taken at site

Delhi land parcels enhance visibility of launch pipeline

The company has significant developable land parcels admeasuring ~101 acres in Delhi, and are scattered in different parts of the city. The land bank is valued at ~Rs65-70bn and, as per the current status, offers a development potential of 6msf. However, the final development plan is contingent on the approval of the Master Plan by the Delhi Development Authority (DDA). The draft for the land use of Delhi has been published and further consultations are under way. Once the Master Plan is approved, the development potential is likely to increase to 10-12msf. This offers good visibility on the launch pipeline and bodes well for maintaining sales momentum over the medium-to-long term in the residential segment.

Exhibit 15: Land parcels in Delhi (101 acres)

Location	Area (no of acres)
Essapur, Najafgarh, West Delhi	4.5
Mundela Kalan, Najafgarh, West Delhi	15.2
Dhansa, Najafgarh, West Delhi	6.6
Holambi Khurd, North Delhi	18.7
Bhati Mines, New Delhi	24.5
Rewari	14.1
Other land parcels	17.6
Total	101.0

Source: Company, Emkay Research

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Diversified product mix across the pricing spectrum and type, in the residential segment

ARL's residential portfolio comprises Integrated Townships (luxury villas, plots, flats), Group Housing, and Affordable Housing projects. Across these sub-segments, it has four completed and five ongoing projects, with three in the planning stage. More projects will be added as development plans on the existing land bank are finalized. **Offering products in different sub-segments enables efficient use of land parcels (improves profitability) as well as caters to various/different classes and categories of customers across the pricing spectrum.**

Integrated Township projects: The company has a couple of integrated townships at various stages of development in Sector 63A. These are strategically located on Golf Course Extension Road, in proximity to prominent schools, hospitals/medical facilities, and several key business as well as commercial parks.

- **Anant Raj Estate (Sector 63A, Gurugram)** is ARL's marquee township consisting of luxury villas, plots, flats, group housing, and commercial projects. It also has a social infrastructure, viz shopping complexes. It has already delivered ~4.7msf of floors, plots, and villas, and is currently developing the ~1.3msf Ashok Estates, which has been launched and has already sold out. Further, it targets developing two projects of independent floors of 0.4msf each which would be launched in FY25 and are likely to be completed in FY28/29.

- **Birla Navya (Sector 63A, Gurugram)** is a 50:50 JV with Birla Estates (wholly-owned subsidiary of Aditya Birla Real Estate). The project involves development of 764 luxury floors spread across 47 acres, and is being developed in four phases, of which three have been launched and are sold out. P-I (ie phase 1) has started getting delivered, whereas P-II and III are under various stages of construction. Phase IV is likely to be launched in H2FY25.

Group Housing Projects: Estate Residences is the group housing project of ARL, consisting of high-rise residential units with a total saleable area of ~3.2msf, including 850 units of premium 4/5 BHK ultra luxury apartments.

Affordable Housing projects: ARL, availing of the opportunity, undertook a couple of projects outside the Delhi-NCR region – one each in Rajasthan and Andhra Pradesh. These include large residential developments in the affordable segment under brand name *Aashray* in Neemrana (Rajasthan) and Tirupati (Andhra Pradesh).

- **Anant Raj Aashray (Neemrana, Rajasthan):** This was the company's first affordable housing project with the Rajasthan government and consists of 2,663 residential units with total developed area of ~1msf. Each unit consists of a compact studio and one-bedroom apartment located within an industrial colony in Neemrana, Rajasthan. The project is completed and sold out.

- **Anant Raj Aashray II (Tirupati, Andhra Pradesh):** This is the company's second affordable housing project that consists of 1,848 housing units across a saleable area of ~1.2msf in Tirupati with the Andhra Pradesh government. With all requisite clearances in place, development and construction work on the project is expected to be completed in FY28. The project is likely to open for sale in FY25.

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Exhibit 16: Projects currently in the residential portfolio

Project Name	Details	Present Status
Anant Raj Estate Township	This is among the most prestigious projects, spread across 121.1 acres. It commenced in 2012 and comprises of residential plots, built-up luxury villas and independent floors, commercial spaces, and other social infrastructure like schools, nursing homes, community centers, office complexes, etc.	The infrastructure of the township is ready and operational. The first phase of Independent Floors has been successfully completed and handed over to buyers, with preparations under way to commence the second phase of Independent Floors development. The second phase is projected to generate revenue of ~Rs16bn over the next three years.
Birla Navya (JV with Birla Estates)	The project involves construction and development of 764 independent luxury floors spanning 47 acres in Sector 63A, Golf Course Extension Road.	The project has seen considerable success, with the first three phases totaling 554 units, fully sold out. The fourth phase of the project is scheduled for launch in FY25. The units launched in Phase-1 are currently being delivered, and possession has been offered to home buyers.
Ashok Estates	The Ashok Estates plotted development is spread across 20.1 acres. This completed plotted development features plots up to 180sq yards. Since its launch, all units have been sold.	The infrastructure of the project is complete, and about 700 independent floors are under construction by plot buyers of the Project. Since its inception, the project has seen an appreciation of over 60%.
Estate Residences	The Estate Residences is a luxury Group Housing project to be developed on a 5.4-acre area. The project has a saleable area of 1msf (248 units), consisting of 4BHK ultra luxury apartments with all amenities and facilities. These apartments will boast of views of the Aravalli Hills on one side and the cityscape of Gurugram on the other.	Launched in Q4FY24, the project had revenue potential of ~Rs18bn – it received remarkable success, with units sold out at an average selling price of Rs18,000/psf. The construction and development of the project has already commenced.

Affordable / low-cost housing		
Anant Raj Aashray II, Tirupati	The project involves construction of 1,848 affordable homes across 10.1 acres of land in the industrial colony of APIIC (Andhra Pradesh Industrial Infrastructure Corporation). It will have a total saleable area of 1.2msf.	All approvals, including RERA for the project, have been received. The construction and development of the project has already commenced, and target for completion is 2027.

Source: Company, Emkay Research

Good scope to accumulate own land, explore JD projects; to maintain focus on the Delhi-NCR region

The company has, using to its own advantage, undertaken a couple of affordable housing projects outside Delhi-NCR. However, given its understanding and expertise of operations in Delhi-NCR, it is scouting growth opportunities with core focus on this region. Apart from the existing ~120 acres of the saleable land parcel in Sector 63A, the company has scope of acquiring 30 acres of land parcels in the same location which can lead to more efficient usage of FAR (to enhance development value and profitability). Additionally, it plans to explore projects on JD basis with land owners in the NCR region. This would further improve visibility on the launch pipeline over the medium term.

Residential sales/collections expected to see 18%/39% CAGR to Rs46bn/Rs26.2bn during FY24-27E

The company has a launch pipeline of Rs70bn which has already been planned (including P-IV at Birla Navya which is a JV project with Birla Estates) and additional Rs100bn of GDV potential which is yet to be planned in Sector 63A (land already available). Additionally, the ~101-acre land bank in Delhi, the recently acquired 20 acres in Sector 63A, and scope to add another ~30 acres at this location would further improve launch visibility in coming years.

On the back of strong demand in core markets, availability of freehold land parcels as well as launch pipeline, we expect residential sales for the company to clock 19% CAGR to Rs46bn during FY24-27E. Additionally, with progress in construction, we expect collections to log CAGR of 39% to Rs26.3bn during this period. This would lead to a strong cashflow stream for the company over the medium term.

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Exhibit 17: Projects in ARL's portfolio

	Region/Location	Type	Saleable area (msf)	Est GDV (Rs mn)	Launch year	Completion year	Status	Structure
Neemrana	Neemrana	Aff Hou	1.0		Aug-13	Aug-17	Completed	Owned
Anant Raj Estate Floors	Sector 63A, Gurugram	Int Township	0.2		Mar-20	Mar-23	Completed	Owned
Anant Raj Estate Villas	Sector 63A, Gurugram	Int Township	0.1		Jul-20	Jul-23	Completed	Owned
Anant Raj Estate Plots	Sector 63A, Gurugram	Int Township	4.4		Sep-16	Sep-23	Completed	Owned
Ashok Estate	Sector 63A, Gurugram	Int Township	1.3	10,000	Jul-22	Dec-25	Ongoing	Owned
Birla Navya	Sector 63A, Gurugram	Int Township	1.9	33,000	Mar-20	Dec-27	Ongoing	50% JV
Anant Raj Aashray2	Tirupati	Aff Hou	1.2	3,350	Nov-23	Jun-27	Ongoing	Owned
The Estate Residences (Group Hosing 1)	Sector 63A, Gurugram	Luxury	1.0	18,000	Jan-24	Jun-28	Ongoing	Owned
Anant Raj Estate Floors 1	Sector 63A, Gurugram	Premium	0.4	7,500	Jan-25	Oct-27	Ongoing	Owned
Anant Raj Estate Floors 2	Sector 63A, Gurugram	Premium	0.4	7,500	Mar-25	Jan-28	Forthcoming	Owned
Anant Raj Estate Group Housing 2	Sector 63A, Gurugram	Luxury	1.1	21,000	Mar-25	Dec-28	Forthcoming	Owned
Anant Raj Estate Group Housing 3	Sector 63A, Gurugram	Luxury	1.1	25,000	Jul-25	Jun-29	Forthcoming	Owned
Balance land in Sector 63A	Sector 63A, Gurugram	Premium/ Luxury	5.1	1,00,000	Jul-26	Jun-32	To be planned	Owned

Source: Company, Emkay Research; Note: Aff Hou = Affordable Housing; Int Township = Integrated Township

Exhibit 18: Residential sales CAGR expected at 18% over FY24-27E
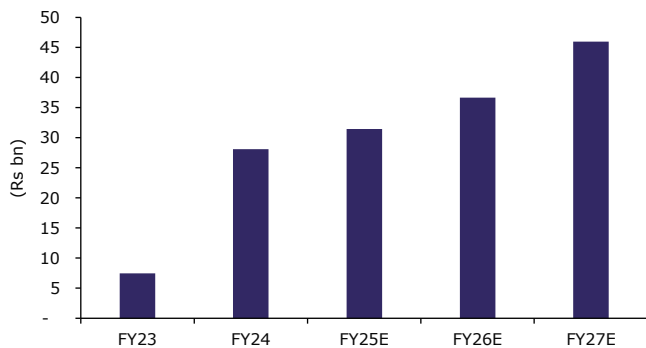
Source: Company, Emkay Research

Exhibit 19: Residential collections CAGR expected at 39% over FY24-27E
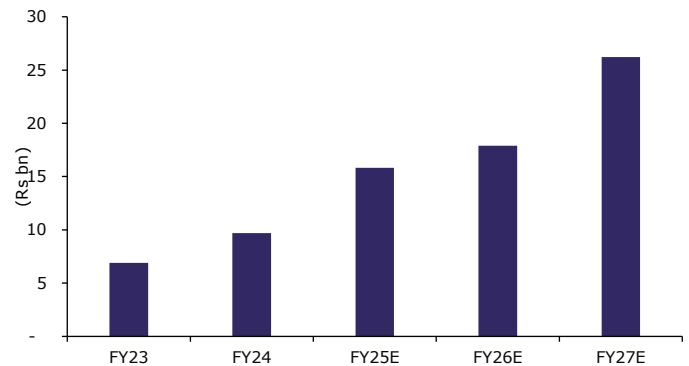
Source: Company, Emkay Research

Timely project delivery at competitive cost

ARL has an integrated real estate development model, with capabilities and in-house resources to carry on a project from its initiation to completion. These include teams for business development, sales & marketing, design, engineering, procurement, construction, liaison, quality assurance, etc. Its strong **experience/track record as a contractor** has enabled efficient time and cost management for construction of projects. Further, its **business development** team scouts for land in strategic locations with good development prospects and clean titles, and focuses on acquiring them at competitive costs. On the other hand, its **sales and marketing** team works closely with sales channel partners to generate sales.

Exhibit 20: Projects indicating the company's execution capabilities

Project Name	Date of land (or development rights acquisition)	Commencement of sale of units	Commencement of handover of units
Anant Raj Estate	15-Nov-11	25-Feb-12	5-May-14
Anant Raj Estate	4-Mar-13	7-Sep-17	22-Feb-18
Anant Raj Estate	16-Nov-16	4-Oct-19	4-Oct-19
Tech Park, Manesar	18-Apr-06	8-May-07	9-Nov-11
Tech Park, Panchkula	26-Jun-08	25-Nov-10	8-Jan-15

Source: Company, Emkay Research

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Commercial assets to generate healthy annuity income

Anant Raj develops IT park, hotels, malls, and office spaces within its commercial portfolio. Currently, it has three IT parks – one each in Manesar, Panchkula, and Rai – that are being converted into data centers (6MW already operational at Manesar, as of Q1FY25). In the hospitality portfolio, the company has existing hotel projects that are well placed in the NCR, and are presently being operated by third-parties on long-term leases. The lease terms include a combination of minimum guarantee and revenue/profit with escalation of ~15% every 3 years. On the other hand, in the mall and office space portfolio, there are a couple of projects that are either under development or at the hand-over stage.

Overall, the commercial portfolio (ex-data centers) currently generates an annuity income of >Rs500mnpa (including CAMS), which is likely to increase to Rs1.6-1.7bn by FY29, once under-construction assets become fully operational.

Hospitality portfolio: Hotel Bel-La Monde currently has an operational leasable area of 70,000sqft, generating Rs4.7mn/month rental income. The company has received approval for increasing FSI, from 0.15 to 1.75; accordingly, additional area of 0.49msf is under development. The overall development is likely to have a mix of hotels (40%), service apartments (40%), and commercial (20%) assets. The other asset—Hotel Stellar Resorts—has an operational leasable area of 0.1msf, generating Rs7.7mn/month rental income. An additional developable area of 0.6msf would be developed after receipt of approval for increasing FSI, from 0.15 to 1.75 (likely by Sep-29). Once expansions are complete, the hospitality portfolio is likely to generate rental income of Rs110-120mn/month (per current rates) at full occupancy.

Retail and office assets: Anant Raj is currently developing Ashok Towers as part of the existing Ashok Estate project, which would comprise commercial shops and offices with total space of 0.16msf; the company targets completing this by 2027. Its other asset 'Joy Square' has 0.32msf commercial and office space, and is at the hand-over stage.

Exhibit 21: Hotel Bel-La Monde's existing structure of 70,000sqft; additional developable area of 0.49msf is currently under development

Source: Emkay Research

Exhibit 22: Projects in the Hospitality portfolio

Project Name	Details	Present Status
Anant Raj Center 1, Chattarpur, South Delhi **(Hotel Bel-La Monde)**	The project features an operational leasable area of 70,000sqft, with additional 0.49msf under development. Approval to increase FSI to 1.75 from 0.15 has already been received, facilitating this expansion. **Rental income:** Rs4.7mn/month.	Developed over a land area of 5.75 acres and currently has constructed area of 0.1msf. It is operational and generates revenue. The construction of additional developable area is in full swing, and phase-1 of the expansion is likely to be completed by FY26.
Anant Raj Center 2, NH-8, Delhi	Developed across 7.61 acres of land on NH-8 (constructed area of 0.1mn sqft). **Rental income:** Rs7.7mn/month.	The project encompasses a leased area of around 0.1mn sqft. Plans are in place to develop an additional 0.6mn sqft. The design and development work is in progress, to increase the Floor Space Index (FSI), from 0.15 to 1.75, as allowed in MPD 2031. The Motel is currently operational and leased to an operator.

Source: Company, Emkay Research

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Exhibit 23: Projects in the office/retail/data center portfolio

Project Name	Details	Present Status
Office Building, Sector 44, Gurugram	A LEED Certified Grade A building with robust infrastructure. It is built on a land area of 8,400sqmt, and has a total area of 210,000sqft.	The commercial building is operational and fully leased.
Ashok Tower	Part of existing project 'Ashok Estate', comprising of commercial shops and offices with total space of 160,000sqft.	To be developed in 0.8 acres having branded outlets and a 2-Screen Multiplex, for catering to the daily needs of people living in the surrounding area.
Joy Square, Sector 63A, Gurugram	Construction of 0.32msf ongoing for commercial and office spaces.	Project at handing over stage (for sale).
Anant Raj Tech Park, Manesar *(being converted to a data center)*	Spread across 10 acres, the project has a total constructed area of ~1.8msf, of which 1.2msf is leasable area. It is located in IMT Manesar and in proximity to Gurugram, a hub of IT/ITeS and BPO companies.	The existing facility is operational with 3MW IT load, and another 3MW has been completed in May-24. The total planned capacity at Manesar Data Centre is 50MW. This targets substantially increasing its capacity and capabilities to meet the growing demands of the data center.
Anant Raj Tech Park, Panchkula *(being converted to a data center)*	Spread across 9.23 acres, the project has a developable area of 1.6msf, of which leasable area is 1.2msf.	The IT Park is currently operational, and a substantial portion of the building is leased to various firms. Part of the existing structure is being converted into 7MW IT Load, which is expected to be completed by Q3FY24-25. Phase 2 involves a Greenfield expansion aimed at developing a 50MW IT load data center capacity.
Anant Raj Trade Centre, Rai *(being converted to a data center)*	Spread across 25 acres, it is a world-class IT destination with total development area of 5.1msf, of which 3.4msf is leasable. It has robust connectivity and proximity to key destinations, including North India, which offers huge potential for business hubs.	The existing building is being upgraded to house a 100-MW Tier III Data Center; additionally plans for greenfield expansion that will introduce either a Tier III or Tier IV Data Center; adding another 100MW of IT Load Capacity is being finalized. Total 200MW has been proposed.

Source: Company, Emkay Research

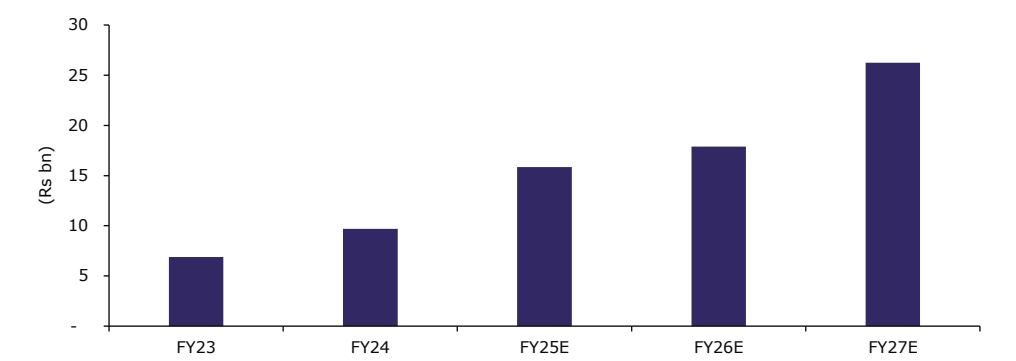## Focus on core operations has rejuvenated post de-merger

During 2013-2020, the company's debt had increased significantly amid the sluggish phase of operations. However, the demerger in FY21 rejuvenated the company's focus on the residential segment, and channelized management bandwidth toward growth. The operational ramp up of the residential business as well as the successful QIP of Rs5bn in FY24 led to net debt swiftly declining, from Rs23.3bn in FY18 to Rs2.9bn, leading to a sharp deleverage, thus improving balance sheet strength. Further, with better collections and a calibrated scale-up in the residential business, net debt could decline further (targets turning net cash by FY25-end).

The improved balance sheet would pave the way for the next leg of sustainable scale up in the residential business as well as ramping up the data center segment, which is a sunrise business for the company.

Exhibit 24: Balance sheet has sharply deleveraged
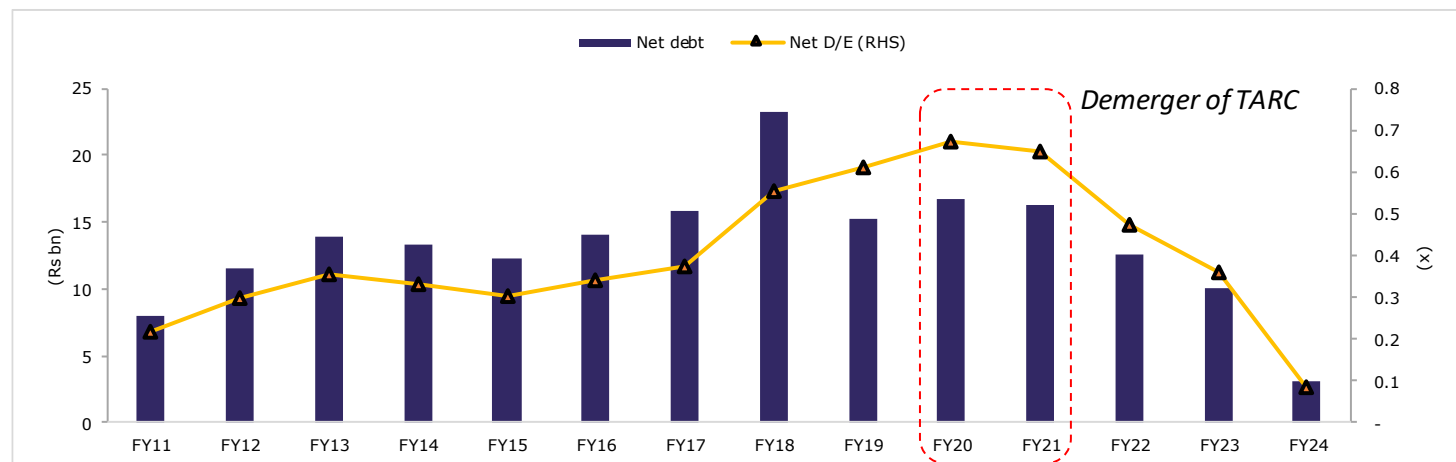
Source: Company, Emkay Research; **Note:** Demerger sanctioned in Aug-2020, but financials have been restated from FY19. Hence, debt figures appear to be lower post-FY18

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Exhibit 25: Strong collections from the residential segment to improve cash-flow visibility, which would aid growth of the Data Center business

Source: Company, Emkay Research

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Data Center – Brief

Data centers in India have witnessed significant growth and transformation in recent years, with their capacity rising two-fold post-pandemic. As of 2023, DC capacity across the top-7 cities stands at ~977MW, spread across 12.8mn sqft (msf). As the country continues to see digital revolution, the demand for data storage, processing, and management is rising. Further, initiatives like 'Digital India' have accelerated the adoption of cloud computing and data-driven technologies, further fueling demand for state-of-the-art data centers in the country. We expect data center capacity in India to witness 35-40% CAGR over the next 3-4 years. Upcoming data centers are being designed with larger data storage capacities, robust data security measures, faster data processing, and energy efficient features.

What is a data center?

Before taking a deep dive into how DCs came into being, the present market scenario, and the prospects ahead, we need to understand the actual definition of a 'data center'.

A data center is a facility designed to store, process, and transmit large volumes of data. It represents a sophisticated intersection of real estate, telecommunications, and energy, thus making it a unique and evolving asset class in the modern economy. Its mission-critical role encompasses hosting IT equipment that underpins the global internet, cloud computing, and telecommunications networks.

How did data centers come into being?

In the age of technology, businesses and individuals rely heavily on platforms such as Google to provide information. This information come from data centers – physical facilities where data is stored.

A DC is a physical location that stores computing machines and their related hardware equipment. It contains the computing infrastructure that IT systems require, such as servers, data storage drives, and network equipment. It is the physical facility that stores any company's digital data.

Every business needs computing equipment to run its web applications, offer services to customers, sell products, or run internal applications for accounts, human resources, and operations management. As the business grows and IT operations increase, the scale and amount of required equipment also increases exponentially. Hence, companies use data centers to bring their devices to a central location and manage it cost effectively. Instead of keeping it on premises, they can also use third-party data centers.

History of data centers

Exhibit 26: How did data centers grow over the years?

Year	Occurrence	Description
1940s	First data center in the world	Data centers trace their roots back to the Second World War, a time when the world's first programmable computer 'ENIAC' was the pinnacle of technology. It was designed by the US army to calculate artillery fire during the war, and was even used by mathematicians and scientists for the Manhattan Project.
1960s-1970s	Commercialization of data centers	In the early 1960s, International Business Machines (IBM) released its first transistorized computer 'TRADIC'. This new model helped data centers branch out from the military sphere to the commercial. The TRADIC also exponentially increased computational abilities and made computer systems smaller and easier to fit into multipurpose spaces like office buildings.
2000s	Internet complementing the need for data centers	The dot-com era was a wholesale reshuffling of world economies brought on by the rise of the 'Internet'. Consequently, it also marked the boom of data centers worldwide. Data centers became critical for national security, internet infrastructure, and economic output. Even when the dot-com bubble burst and left massive economic strife in its wake, the data center boom has persisted since.
2005-2010	How cloud services came into being	Companies needed fast internet connectivity and nonstop operations at an unprecedented scale. Establishing such expensive data centers and Internet infrastructure was not viable for several small companies. MNCs like Amazon and Google began to develop vast data centers, which provide companies with an array of services and technological solutions. Proliferation at a massive scale followed into the 2000s and 2010s.

Source: Industry, Emkay Research

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Why choose a data center over an on-premises infrastructure?

On-premises infrastructure vs modern day alternatives

Modern data centers have, over the course of time, evolved to better manage IT complexity. Companies used data centers to store physical infrastructure in a central location that they could access from anywhere. With emergence of cloud computing, third-party companies manage and maintain data centers and offer infrastructure as a service to other organizations.

Exhibit 27: On-premises infrastructure vs modern day alternatives

Data Center	Description	Advantage	Limitation
On-premises	These are fully owned by the company and store sensitive data and critical applications solely for the company. The company needs to set up the data center, manage its ongoing operations, and purchase and maintain the equipment.	An enterprise data center can give better security, as risk is managed internally. The data center can be customized to meet requirements.	It is costly to set up own data center and manage ongoing staffing and running costs. The company also needs multiple data centers, as having only one can become a high-risk point of failure.
Co-location (Colo)	Co-location facilities are large data center facilities in which companies can rent space to store their servers, and other computing hardware. A co-location center typically provides security and support infrastructure, such as cooling and network bandwidth.	Co-location facilities reduce ongoing maintenance costs and provide fixed monthly costs to store hardware. The company can also geographically distribute hardware to minimize latency, in order to be closer to the end users.	It can be challenging to source co-location facilities across the globe and in different geographical areas that the company targets. Costs could also add up quickly, as and when companies keep expanding their accessibility to global markets.
Cloud	In a cloud data center, the company can rent both, space and infrastructure. Cloud providers maintain large data centers keeping in mind security and compliance. Companies can access this infrastructure by using different services, giving more flexibility in usage and payment.	A cloud data center reduces both, hardware investment and ongoing maintenance cost, of any infrastructure. It gives greater flexibility in terms of usage options, resource sharing, availability, and redundancy.	

Source: Industry, Emkay Research

All about Data Centers

The exponential growth in data that is expected for the next several years suggests a strong growth outlook for the infrastructure needed to create, process, transmit, and store all such data. We believe that we are still in the early innings of the digital transformation of businesses in the 21st century which we see as akin to the first industrial revolution in the 18th century. Data centers should continue to play a central role as organizations increasingly use data to improve their productivity and profitability.

The digital transformation that was thought to be a multi-year evolution has been accelerated post-Covid, reinforcing the importance of digital infrastructure. We believe, however, that digital transformation of organizations is a secular, not cyclical, shift in how organizations do things, and that demand should remain solid.

Exhibit 28: Data Center operations, factors to be considered

Source: Industry, Emkay Research

(i)   Components

There is a common misconception that data center infrastructure is only made up of computing resources. We can categorize DC components into 3 major parts:

- **Servers**: These are the most well-known components. These devices manage and process data. Modern server infrastructure also includes cloud computing and virtualization.

- **Network:** These are the system of cables, routers, and switches that connect all devices within the data center. They allow data transfer between different locations, both, internally and externally.

- **Storage:** Handles how data is stored and retrieved. It also ensures the security and availability of data.

Exhibit 29: Components of a data center

Component	Description
Servers	Physical structure and size are the differentiating pointer, and include rack servers, blade servers, and tower servers
Storage Systems	Data centers use various storage technologies, such as Storage Area Networks (SANs), Network Attached Storage (NAS), and Direct Attached Storage (DAS), to store and manage data
Networking Equipment	Switches, routers, firewalls, and load balancers to provide efficient data communication and security
Power Infrastructure	Uninterruptible Power Supply (UPS) systems, backup generators, and power distribution units (PDUs)
Cooling Systems	Computer Room Air Conditioning (CRAC) units, liquid cooling systems, and hot/cold aisle containment maintain optimal temperature
Enclosures	Racks and cabinets used in data centers include open frame racks (two- and four-post racks), enclosed racks, wall-mounted racks, and network cabinets
Cabling	Structured cabling systems, including twisted pair cables (for Ethernet, such as Cat5e, Cat6), fiber optic cables (single-mode and multi-mode)
Security Systems	Physical security measures like biometric access control, surveillance cameras, and security personnel, as well as cybersecurity solutions like firewalls, intrusion detection/prevention systems (IDS/IPS)
Management Software	Software that helps monitor, manage, and optimize the performance and energy efficiency of DCs components

Source: Industry, Emkay Research

Data center equipment, including generators, power distribution units (PDUs), uninterruptible power supplies (UPS), switchgear / transformers, and HVAC / cooling systems all have useful lives of >20 years. We assume DC capex being infused to have a life span of 20 years in our projections.

Exhibit 30: Life of the components of a data center

Data Center - Component	Category	Useful Life
Power Distribution Units	Electrical Infrastructure	20 years
Uninterrupted Power Supply	Electrical Infrastructure	25 years
Switchgear / Transformers	Electrical Infrastructure	30 years
Heating, Ventilating and Air Conditioning	Mechanical Infrastructure	20 years
Chiller Pumps / Building Automation	Mechanical Infrastructure	25 years
Chilled Water Storage and Pipes	Mechanical Infrastructure	30 years
Fire Protection	Other	40 years
Security Systems	Other	20 years

Source: Industry, Emkay Research

Notably, one component of a data center that needs to be replaced much more frequently is batteries, which safeguard facilities from power disruptions. In the event of a power outage, batteries supply power first, followed by backup generators, which take about a minute to turn on. Typically, batteries have a useful life and are replaced every 5-6 years.

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(ii) Type of Data Center offerings

Each type of data center varies in terms of typical size, lease timeline, location in the network, and caters to the needs of varied customers.
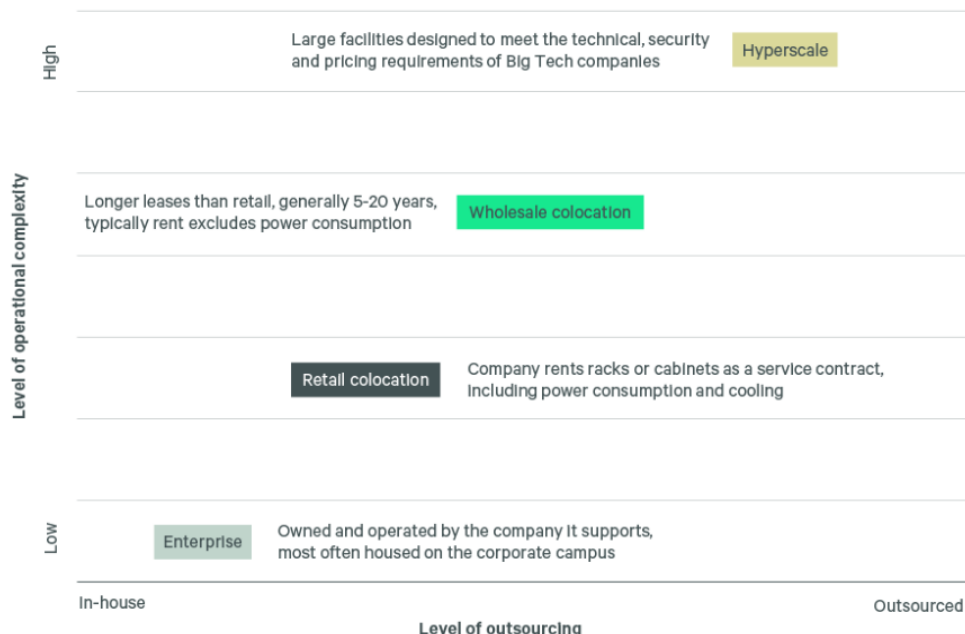
Main types of data centers:

- Enterprise data centers,

- Co-location data centers,

- Hyperscale data centers,

- Edge data centers.

Exhibit 31: Size of different data centers; Hyperscalers have the ability to scale infrastructure seamlessly in response to demand

Source: Industry, Emkay Research

Exhibit 32: Types of data centers differ by level of operational complexity and outsourcing

Source: Industry, Emkay Research

Exhibit 33: Types of DC offerings

No	Type of DC	Description	Average size	Lease timeline	Who Uses such DCs
1	Enterprise DCs	Facilities owned and operated by an individual organization to meet its own IT infrastructure requirements. Well-suited for organizations requiring customized networks or can benefit from economies of scale due to significant amounts of traffic. Organizations choose to maintain enterprise DCs for a variety of reasons, such as: Regulatory compliance, Privacy protection, Superior performance, Enhanced security. Organizations are increasingly adopting a hybrid IT model, combining cloud services with DC operations both, on-premises and via colocation DCs. Enterprises are transitioning from on-premises to cloud environments, primarily for enhanced scalability and to expedite the launch of new applications and services. Moreover, enterprise DCs often face issues with resource under-utilization, stemming from inadequate resource allocation, lack of workload optimization, and limited visibility into resource usage.	Customized basis requirement	Organization responsible for maintenance	Well-suited for organizations that require customized networks or can benefit from economies of scale due to significant amounts of traffic or data being processed and managed within their DC.
2	Colocation DCs	Used to house computing hardware, servers, and supporting infrastructure in an off-site location. Third-party facilities are particularly useful for organizations that lack the space or IT resources to manage their own enterprise DC. These DCs allow organizations to lease the space they require to host their data, with the ability to quickly scale up or down to meet changing needs. These facilities provide: High availability (uptime) Robust bandwidth capacity Low latency access to data	100kW-5MW	1-3 years	- MSMEs looking to outsource their DC requirements - Large enterprises with specialized IT expertise and demands - Online media, content creators, and social networking platforms - Content delivery networks (CDNs) - Government agencies
2.1	Retail Colocation DCs	Caters to customers with smaller power capacity needs. Operator manages day-to-day operations, power capacity, cooling, and security, as well as access to telecommunications carriers and internet service providers (ISPs). Customers are responsible for maintaining their equipment within cabinets or cages. Retail colocation services support smaller DC footprints and lower individual power capacity requirements.	100kW-1MW	1-3 years	
2.2	Wholesale Colocation DCs	Facilities leased to a single customer responsible for managing day-to-day operations of either a full building or data hall, to create a fully functioning DC. Unlike retail colocation providers, operators herewith offer only space and power, without additional services. Wholesale DCs have fewer connectivity options to carriers and internet service providers (ISPs).	1-5MW	5-10years	
3	Hyperscale DCs	Hyperscale DCs (aka cloud DCs) are massive, centralized, and custom-built facilities that are operated by a single company. These facilities primarily support cloud service providers (CSPs) and large internet companies with enormous compute, storage, and networking requirements. These house thousands of racks and servers across 50,000sf-1mn sf. As such, these DC facilities can cost upward of USD1bn to construct. Located on the outskirts of major cities, providing supply and cost advantages in land and power. Geographically, these are built in 'Tier 1' DC markets.	5-100MW	10-15years	- Self Built by cloud service providers like: AWS Google Microsoft Azure - Can be outsourced to DC providers: Digital Realty Iron Mountain Equininx
4	Edge DCs	These are smaller, decentralized facilities that provide compute and storage in a location closer to where data is being generated and used; situated near intended users, allowing for real-time data processing and analysis. These perform analysis closer to the source of data creation, response latency is reduced and bandwidth is optimized, which facilitates the development of new applications. This is in contrast to traditional centralized data storage facilities that rely on multiple networks and DCs for processing.	50kW-500kW		- Telecommunications central offices - Cable head ends - Base of cell towers - On-premises at an enterprise.

Source: Industry, Emkay Research

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(iii) Rack Density

Rack density refers to the amount of computing equipment installed and operated within a single server rack. It is calculated by the rack's power requirements (measured in watts) divided by the available space (measured in rack units). Density of 10kW per rack is common at present, with some high-density data centers adopting 15-25kW racks. High-density data centers can pack more power, culminating into more data being stored in a smaller space, consolidating resources and hence enhancing efficiency.

Hyperscalers, which have been at the forefront of adopting AI and high-performance computing (HPC), have the greatest need for high-density infrastructure. Currently, their facilities have an estimated average density of 36kW/rack, which is estimated to see 7.8% CAGR over coming years, and approach 50kW levels by 2027. These applications introduce much higher power densities per rack than those traditionally allocated to standard enterprise activities.

Where basic computing typically operates on densities of around 4-5kW per rack, training centers dedicated to generative AI rely on racks that can exceed 100kW, assembled into massive clusters of GPU chips and linked by ultra-fast interconnect technologies.

Exhibit 34: Average rack density is increasing, especially in hyperscale data centers (APAC ex-Japan)
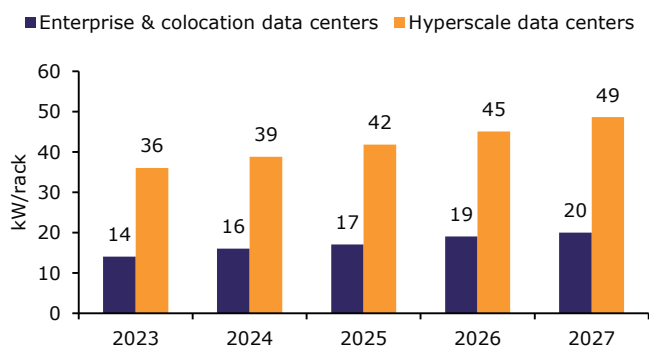
Source: JLL, Industry, Emkay Research

Exhibit 35: Data center power density breakdown, (survey on 724 IT professionals)
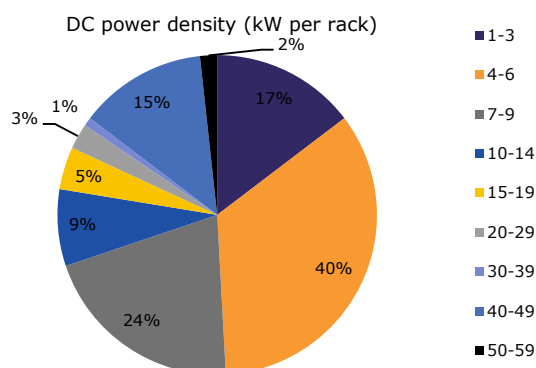
Source: Uptime Institute, Industry, Emkay Research

About 70% of India's DC supply pre-pandemic was 4-20MW, catering to medium retail and wholesale occupiers. Share of large-size data centers (>20MW) has increased, from 26% during pre-pandemic times to 67% post-pandemic, amid rise in demand from hyperscalers. Average data center size in Mumbai and Chennai is 50-60% higher than that in other cities, given the development of large data center parks. Penetration of small size data centers (<4MW) currently remains low, but is likely to increase in the next 3-4 years with more edge deployments.

Exhibit 36: Size wise split of Indian DCs
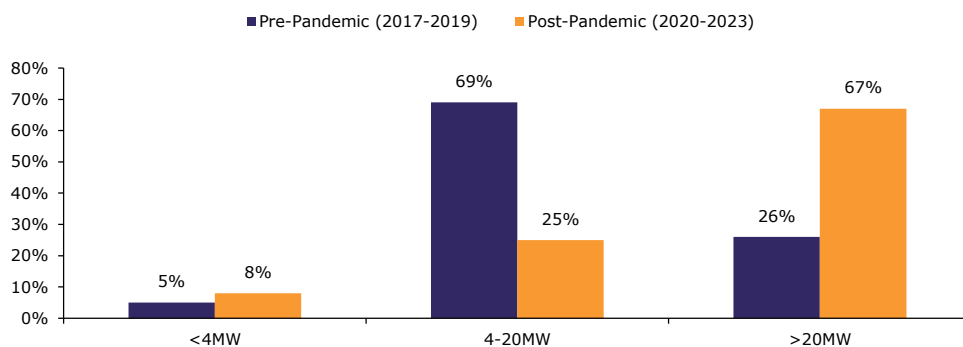
Source: Colliers, Industry, Emkay Research

(iv) Network Density

Network density and connectivity are crucial concepts in understanding how information flows and spreads through networks. These metrics help us grasp how tightly interconnected nodes are and how easily they can communicate with each other.

An Internet exchange point (IXP) is a physical place, sometimes inside a data center, where different networks send traffic toward each other. So, rather than a network having to go all the way back to its own hub, which might be located halfway across the world, it can use another network to move the data. Networks mutually agree not to charge any money for this, as everyone using the IXP benefits. This practice, known as 'peering', reduces latency, lowers costs, and makes connections more reliable.

Peering means there is a larger number of routes for data traffic to travel on, which makes the whole network more resistant to problems in international connectivity. All this can improve access and support economic growth. IXPs are vital nodes in the peering ecosystem, and an important part of the global Internet.

A data center's connectivity to the broader internet ecosystem is another critical component. Low-latency high-speed network connections enable seamless data transmission to and from the facility. Most data centers are connected directly to fiber-optic networks and serve as hubs in global telecommunications systems. For investors, understanding the facility's geographical positioning in relation to network nodes, submarine cables, and other internet infrastructure is essential for evaluating the center's value proposition. High-latency connections can reduce a data center's appeal, particularly for applications such as high-frequency trading or cloud gaming.

In totality, there are 1,438 active IXPs; this translates into 1,378Tbps of data being transmitted. In 2020-21, India had too few IXPs; this leads to vulnerability in respect of internet resilience. There were only about 24 IXP locations then (TRAI 2021), or 0.17 IXPs per 10mn population. With over 1,438 IXPs spanning ~175 countries, IXPs enable networks to interconnect directly, rather than through one or more third-party networks, thus reducing both, costs and latency, while increasing bandwidth. USA accounts for the most IXPs, totaling over 179, followed by Brazil (47) and Russia (38). Increased investments in, and a more aggressive growth of, IXPs would lead to enhanced affordability and improved resilience/reliability, which are crucial for achieving the status of a digital economy superpower. At present, India is ranked 4th, with 34 operating IXPs, which are distributed across several locations; majority of these are located in Mumbai (9), followed by Delhi and Kolkata (6 each).

Exhibit 37: Globally, 1,438 IXPs can transmit 1,378Tbps
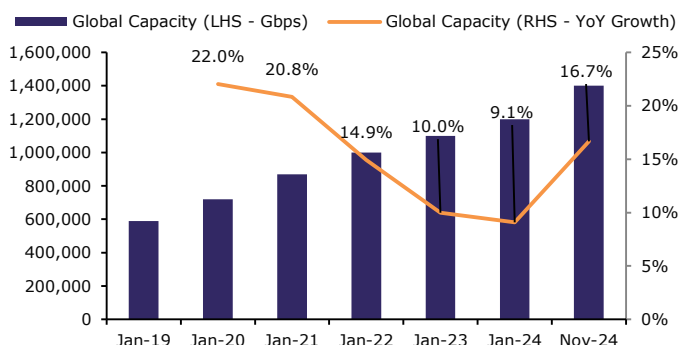
Source: Industry, Emkay Research

Exhibit 38: India has been adding capacity at a faster clip vs global
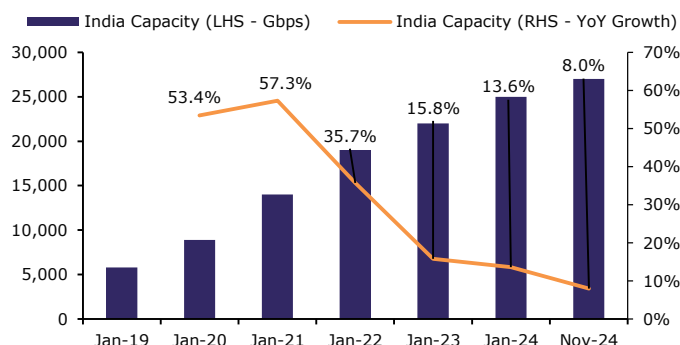
Source: Industry, Emkay Research

The US is globally ranked #1, when it comes to IT infrastructure; over the past decade, this has favored setting up of data centers across the country. We believe, though, there is still room for improvement in certain categories when it comes to the IT infrastructure of India; the existing infrastructure is well suited to promote investments across the DC industry.

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Exhibit 39: India's IT Infrastructure rating bodes well for promoting investments in the data center industry

Category	Description	USA	China	Singapore	India	Asia - average
Open Internet Environment	**Open Internet allows people and organizations to mix and match technologies without permission and with minimal barriers. Sustaining and growing an open Internet helps spur innovation and keep it fit for future applications**					
i) Internet Use	Individuals using the Internet as a percentage of the total population	97%	78%	94%	46%	74%
ii) Internet Shutdowns (in the last 12 months)	Intentional disruptions of Internet communications, making them unavailable for a specific population, location, or type of access	0	0	0	28	
iii) Internet Resilience Score	A resilient Internet connection is one that maintains an acceptable level of service in the face of faults and challenges to normal operations	58%	57%	66%	52%	48%
iv) Internet Freedom	Freedom on the Net measures Internet freedom in countries	Free	Not Free	Partly Free	Partly Free	
v) Transit Provider Diversity	More diversity in routes to the global Internet improves connection resilience	Fair	Poor	Very Good	Poor	
vi) Retail ISP Diversity	Diversity of retail Internet providers improves resilience and user choice	Excellent	Very Good	Excellent	Fair	
vii) Popular Content Locality	A measure of how much web content is popular locally, hosted in-country or in-region	94%	33%	66%	86%	49%
Globally Connected Infrastructure	**It allows networks and users to interconnect without geographical restrictions. Increasing connectivity of the Internet makes it more valuable to every participant, as a tool for communications, learning, commerce**					
i) Network Assigned (no of)	A measure of the number of Internet networks active here	31,032	6,739	683	5,903	614
ii) IPv6 Adoption	Enabling the Internet to support more users and more uses	54%	9%	18%	77%	21%
iii) IXP Count	IXPs help strengthen local Internet connectivity, develop local Internet industry, improve competitiveness, and serve as a hub for technical activity.	179	16	10	34	6
iv) Active Internet Exchange	Points Proportion of the local Internet that can be reached through IXPs in this country	5.9%	1.0%	11.1%	13.8%	
v) Capacity (Gbps)		250,000	3,600	52,000	27,000	
vi) Peering Networks	Peering networks help keep Internet traffic local, provide faster connections, and improve the experience of people relying on them.	2,648	95	640	924	129

Source: Industry, Emkay Research

(v) Redundancy (N)

Data center redundancy refers to the practice of deploying duplicate critical components and infrastructure to allow continuous operations in the event of failure. By implementing redundancy, data center operators aim to provide high availability and reliability to their end users.

'N' represents the minimum requirement for a fully functional system without any redundancy, making it susceptible to single points of failure; any disruption, such as hardware issues, maintenance, or outages, would render the DC inoperable till the problem is resolved.

Exhibit 40: Redundancy Configurations

Configuration	N+1	N+2	2N	2N+1
Description	1 additional component for redundancy	2 additional components for redundancy	2 separate, identical systems, providing full redundancy	2 separate, identical systems, plus 1 spare component
Redundancy Level	Moderate	High	Very High	Extremely High
Failover Capacity	Handles failure of 1 component	Handles failure of 2 components	Handles failure of an entire system	Handles failure of an entire system plus 1 extra component
Cost	Moderate	High	Very High	Extremely High

Source: Industry, Emkay Research

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(vi) Power Usage Effectiveness (PUE)

PUE is a measure of data center energy efficiency, calculated by dividing total facility power by IT equipment power. A PUE near 1 signifies high efficiency, with most power used for computing, while a higher PUE indicates greater power use for cooling and electrical losses.

To calculate PUE, the total amount of power entering the data center is divided by the power used specifically by the IT equipment, such as servers, storage systems, and networking equipment. This metric helps quantify the proportion of a data center's power utilized directly for computing versus the amount consumed by cooling systems, electrical losses, lighting, and other support infrastructure.

Exhibit 41: PUE computation
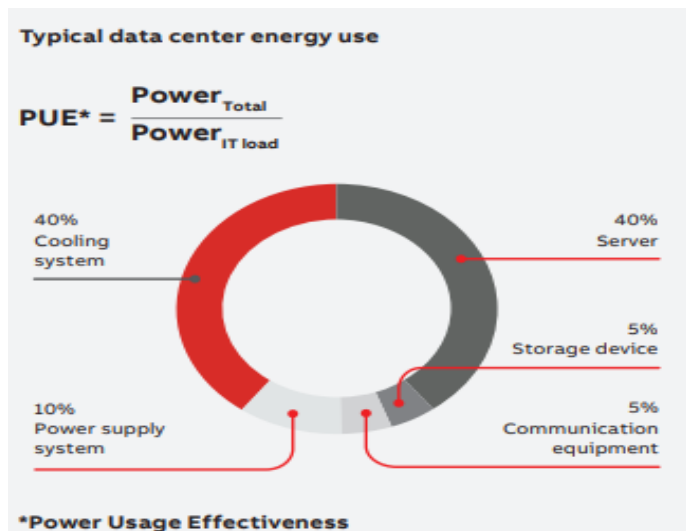
Source: ABB, Industry, Emkay Research

Exhibit 42: Power utilization in DC

Source: ABB, Industry, Emkay Research

Exhibit 43: Interpretation of PUE

Source: Dgtl Infra, Industry, Emkay Research

Exhibit 44: Data center average PUE worldwide (2007-2023)

Source: Industry, Emkay Research

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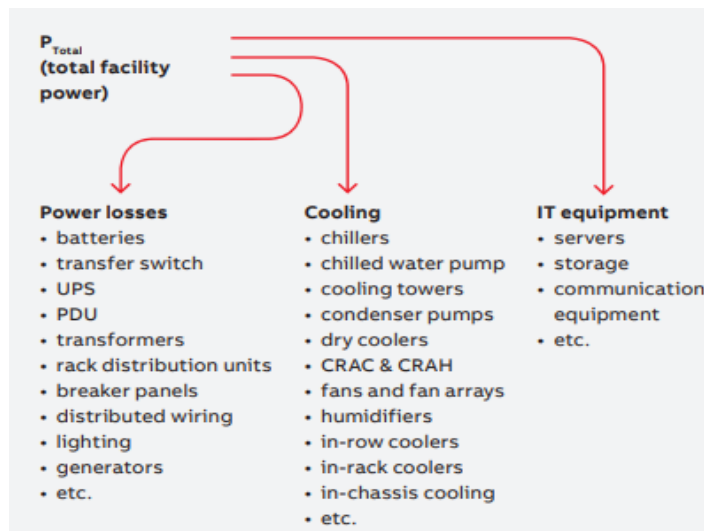
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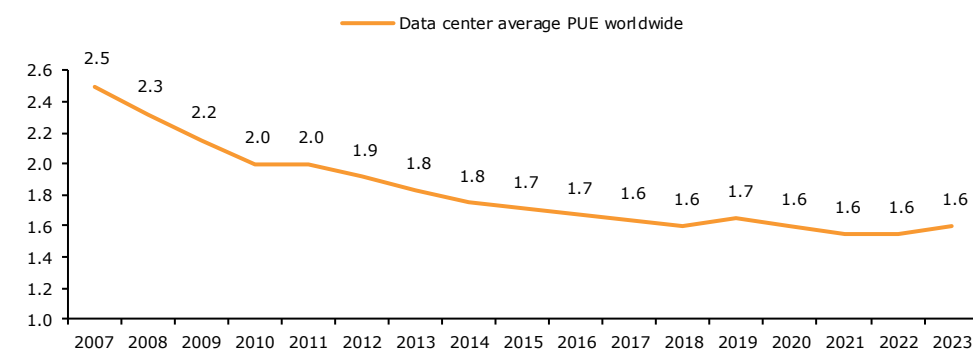
Exhibit 45: Weighted average PUE, by IT capacity of data center
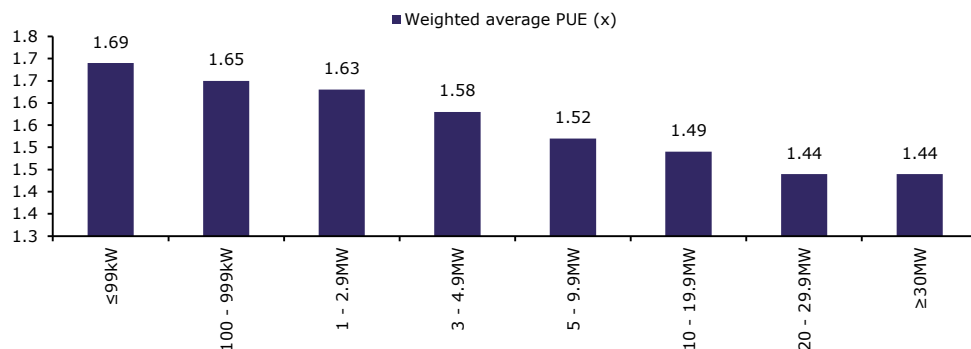
Source: Industry, Emkay Research

Exhibit 46: PUEs of data center operators; retail and wholesale data center operators report higher PUE values vs hyperscalers

Data Center operator	Operator type	PUE
Meta Platforms	Internet Company	1.08
Google	Cloud Service Provider	1.1
Microsoft	Cloud Service Provider	1.18
Switch, Inc	Hybrid Colocation	1.18
Alibaba	Cloud Service Provider	1.22
CoreSite	Retail Colocation	1.37
CyrusOne	Wholesale Colocation	1.45
Equinix	Retail Colocation	1.46
Data Center – Average		**1.58**

Source: Industry, Emkay Research

(vii) Tier

The Uptime Institute has established a tier classification system (ranging from 1 to 4) to evaluate data center performance, primarily based on the redundancy of equipment such as cooling systems, power capacity, backup generators, and fire security systems. Achieving Tier-4 status indicates the highest level of performance, but can be challenging due to requirements such as dual power supply sources which cannot always be implemented across multiple regions globally.

By requiring greater redundancy to achieve higher tier certification, the cost of fitting-out a data center rises, as a project targets a higher tier certification level. The cost of constructing and fitting-out a Tier IV data center can be 25-40% more than that for a Tier III data center and double that for a Tier II data center.

As data centers increased in size and complexity, and began storing sensitive and critical information, governments and other organizations imposed regulations on them. Four levels or standards were established, that cover all aspects of data center design; these are:

■ Architecture and topology

■ Environmental design

■ Power and cooling systems and distribution

■ Cabling systems, pathways, and redundancy

■ Safety and physical security

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Exhibit 47: Global Standards established for DCs

Level	Tier I	Tier II	Tier III	Tier IV
Redundancy	No	Partial; redundant components	N+1	2N or 2N+1
Redundant Distribution Paths	No	No	Yes, but only one path active at a time	Yes, all paths active simultaneously
Uptime Guarantee	99.67%	99.74%	99.8%	99.99%
Downtime per Year	28.8 hours	22 hours	1.6 hours	0.4 hours
Concurrently Maintainable	No; maintenance requires downtime	No; maintenance requires downtime	Yes, without taking DC offline	Yes, without taking DC offline
Cost	Moderate	High	Very High	Extremely High

Source: Uptime Institute, Industry, Emkay Research

(viii) Cooling Equipment

One of the most vital tasks for any DC is environmental monitoring and management. High temperatures and humidity levels can damage IT equipment. Data centers use a considerable amount of power that translates into heat. The more equipment packed into a facility, the greater the heat generated. High temperatures and humidity levels are undesirable conditions for IT and electrical equipment. Most IT devices and equipment produce heat, which they need dispense with quickly so that performance is not affected. DCs can be cooled in multiple ways:

- **Air cooling:** This cooling method is ideal for smaller DCs that combine raised floors with hot and cold aisle designs. When the computer room AC (CRAC) unit or computer room air handler (CRAH) sends out cold air, the pressure below the raised floor increases and sends the cold air into the equipment inlets.

Exhibit 48: Data center cooling systems and technologies
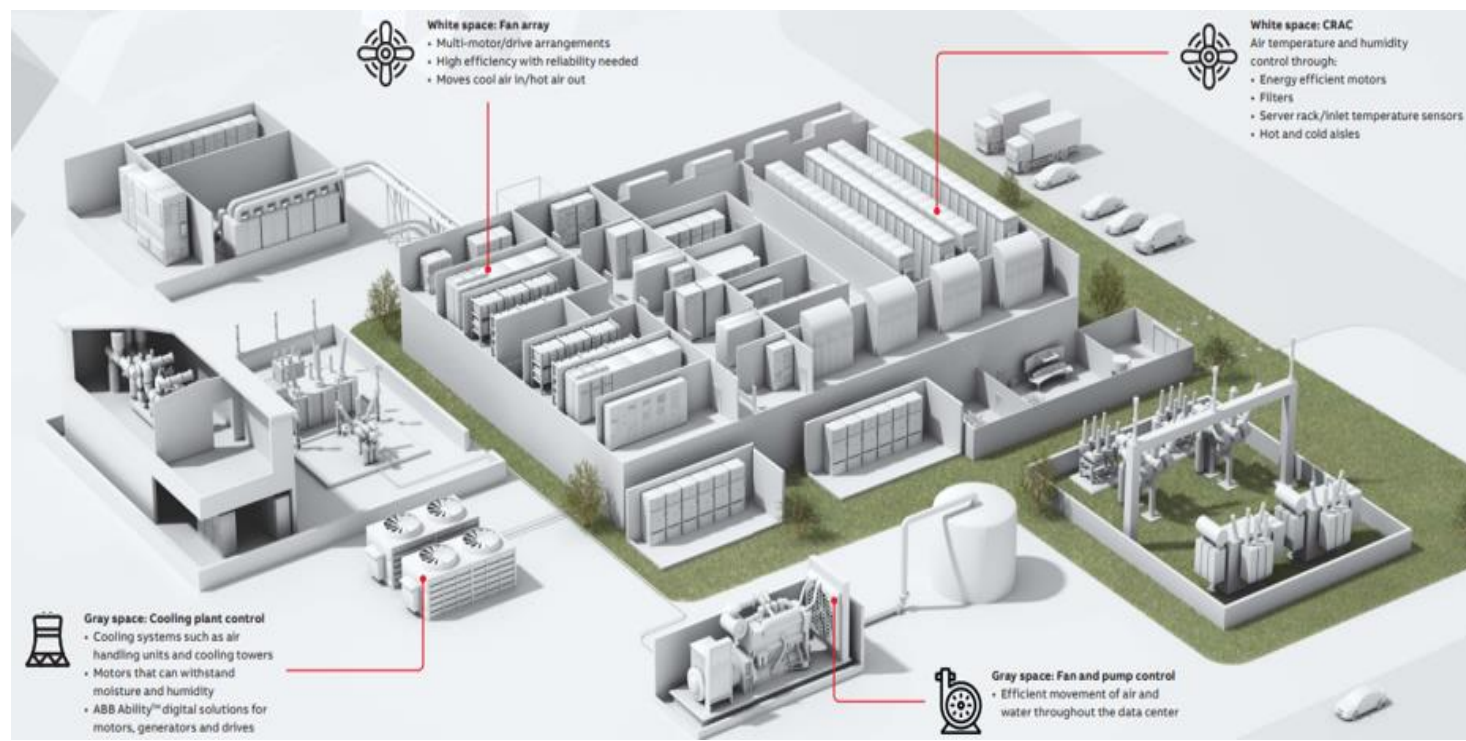
Source: ABB, Industry, Emkay Research

- **Liquid cooling:** A relatively newer technology, this is a more efficient and cost-effective cooling system, as it can be installed in DC devices that require it the most. Liquid is more efficient than air, for transferring heat away from emitting sources. It can also support greater equipment densities and items that generate higher-than-average heat such as high-density and edge-computing data centers. DC operators need to be promptly turn to liquid cooling for staying competitive in the current age of generative AI. Benefits of liquid cooling—such as enabling higher efficiency, greater rack density, and improved cooling performance—make it an essential approach for organizations that want to incorporate cutting-edge technologies and meet cooling needs of the resulting high-density workloads. Albeit some challenges associated with liquid cooling involve risk of leaks or other failures that could cause damage to the critical hardware.

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Exhibit 49: Liquid cooling in the AI landscape
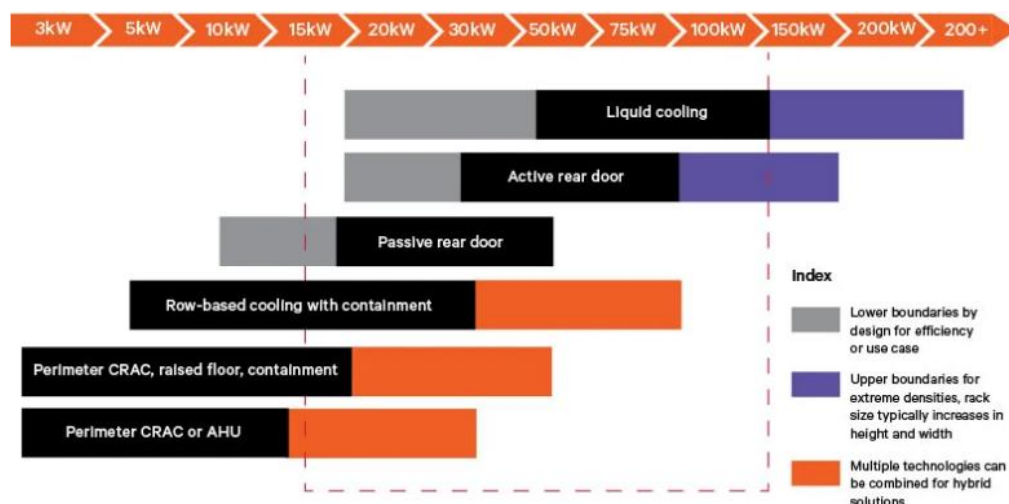
Source: Vertiv, Industry, Emkay Research

Global scenario of Data Centers and their future

(i) Global market size

The exponential growth in data that is expected for the next several years suggests a strong growth outlook for the infrastructure needed to create, process, transmit and store all this data. We believe that we are still in the early innings of the digital transformation of businesses in the 21st century, which we see as akin to the first industrial revolution in the 18th century. Data centers should continue to play a central role as organizations increasingly use data to improve their productivity and profitability.

The digital transformation that was thought to be a multi-year evolution has been accelerated post-Covid, reinforcing the importance of digital infrastructure. We believe, however, that digital transformation of organizations is a secular, not cyclical, shift in how organizations do things, and that demand should remain solid.

Exhibit 50: Country-wise data center market maturity level
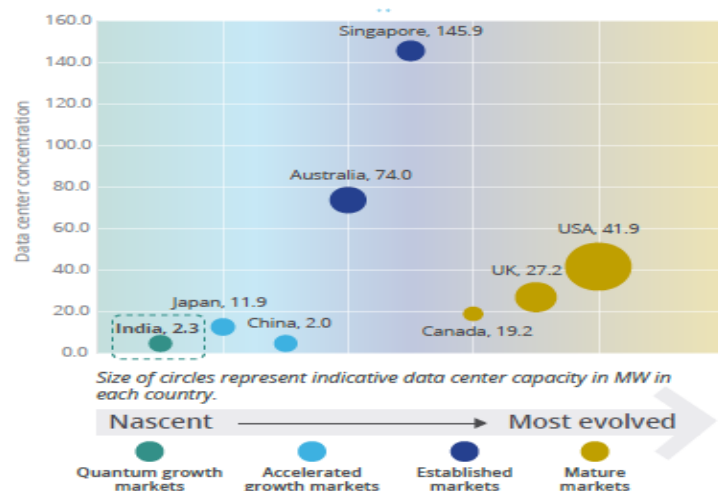
Source: Colliers, Industry, Emkay Research

Exhibit 51: Countries with highest number of data centers (June-23)

Source: Colliers, Industry, Emkay Research

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Exhibit 52: The global DC market – 85 countries, ~8,000DCs, 389 providers; 33%/16%/10% of these DCs are located in US/Europe/China
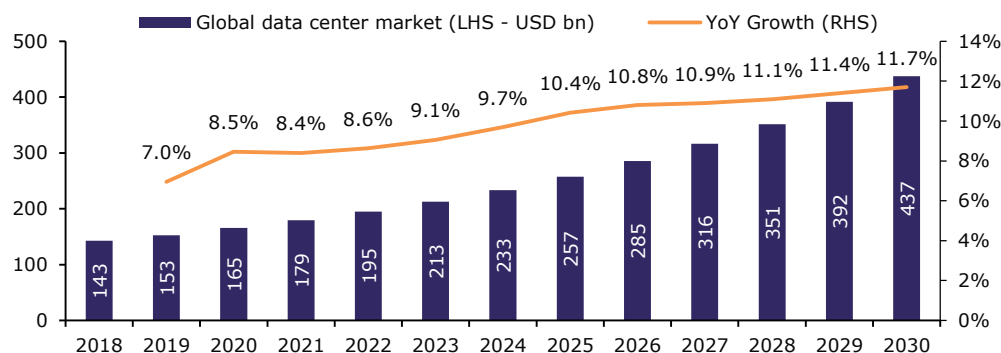

Source: Industry, Emkay Research

Factors such as digital transformation, cloud computing, and the proliferation of connected devices have contributed to the expansion of the data center market. Additionally, advancements in technology and the need for efficient data management have been driving factors for growth in revenue. With the continuous growth of data-driven technologies, the global data center market is expected to continue expanding in coming years. It is estimated that the global data center market size has reached ~USD212.5bn in 2023, and is expected to reach USD437.3bn by 2030 (10.9% CAGR). According to industry reports, the market is expected to clock CAGR of ~6.1-10.9% (depending on different sources), over 2023-30.

The demand for enterprise data-center services has been driven by a wide range of industries that recognize the importance of robust and reliable data infrastructure:

■ **Technology sector:** This industry prominently relies on DCs to support the storage, processing, and analysis of vast amounts of data generated by software development, cloud computing, and emerging technologies like artificial intelligence and machine learning.

■ **Financial sector:** Banks, investment firms, and insurance companies require secure and high-performance DCs to handle sensitive financial transactions, manage customer data, and ensure regulatory compliance.

■ **Healthcare organizations:** This industry too relies on DCs to store electronic medical records, conduct research, and enable telehealth services.

■ **E-commerce and retail:** utilize DCs to manage their online platforms, handle inventory management, and process customer transactions. The media and entertainment industry leverages data centers to manage content distribution, streaming services, and digital advertising operations.

Notwithstanding any type of technology that is being deployed or the industry that an enterprise operates in, it is crucial to place data in the right geographical location to ensure optimal performance, security, and compliance. The choice of a data-center location can impact factors such as latency, network connectivity, data sovereignty, and disaster recovery capabilities. As businesses increasingly rely on data-driven operations and cloud services, choosing the right data center has never been more vital for efficient and reliable data storage, processing, and accessibility.

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Exhibit 53: Data center market CAGR expected at ~11% during 2024-2030

Source: Horizon, Industry, Emkay Research

Exhibit 54: India expected to increase its global share by 2030

| Current Market Size (USD mn)	Global	USA	Europe	APAC	India
Market Size (2023)	212,534	55,173	53,899	42,953	5,378
Targeted Size (2030)	437,326	110,449	103,559	100,935	14,615
CAGR (2023-2030)	10.9%	10.4%	9.8%	13.0%	15.4%
Proportion of Global Market Size (2023)		26.0%	25.4%	20.2%	2.5%
Proportion of Current Global Market Size (2030)		25.3%	23.7%	23.1%	3.3%
Change in market Share (2023 vs 2030)		-70.42bps	-168bps	287bps	81.17bps

Source: Horizon, Industry, Emkay Research

Even before the release of AI platforms for public use, expectations for data center demand were high due to the trajectory of data growth. Several trends will push demand significantly higher in coming years:

- A shift toward big data
- More workloads in the public cloud and robust IT spending

Significant increase in Generative AI as a percentage of technology spending

We believe the AI drive will be initially led by the Big Tech companies before a more widespread adoption by enterprises, governments and consumers, indicating even bigger growth prospects going ahead. [*More on AI and demand drivers ahead.*]

Exhibit 55: Worldwide data creation (2010-2035) to fuel data center demand
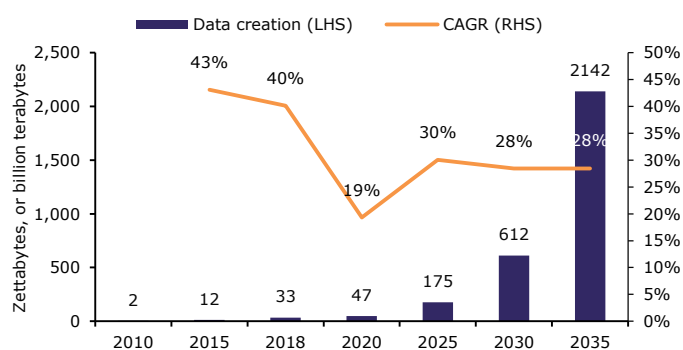
Source: Industry, Emkay Research

Exhibit 56: Significant growth in AI is further contributing to data center demand
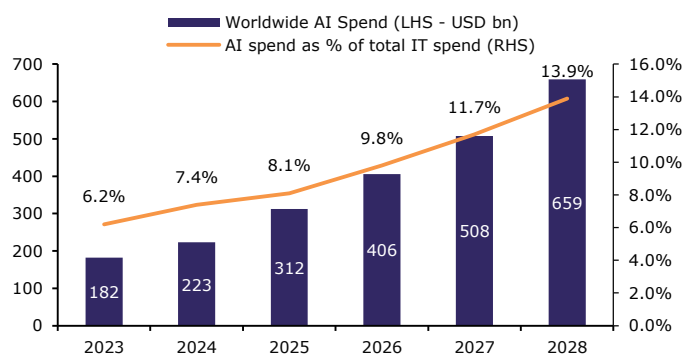
Source: Industry, Emkay Research

The general trend is that data centers are becoming larger and highly customized to the needs of tenants. Close to ~1,000 hyperscale data centers have been built worldwide, accounting for ~37% of total DC capacity. Current demand trends suggest that number could double and hyperscale data centers could account for half of all capacity, while enterprise on-premise data centers are expected to fall to less than ~30%.

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Exhibit 57: Global Data center capacity trend; transitioning toward outsourcing data responsibility
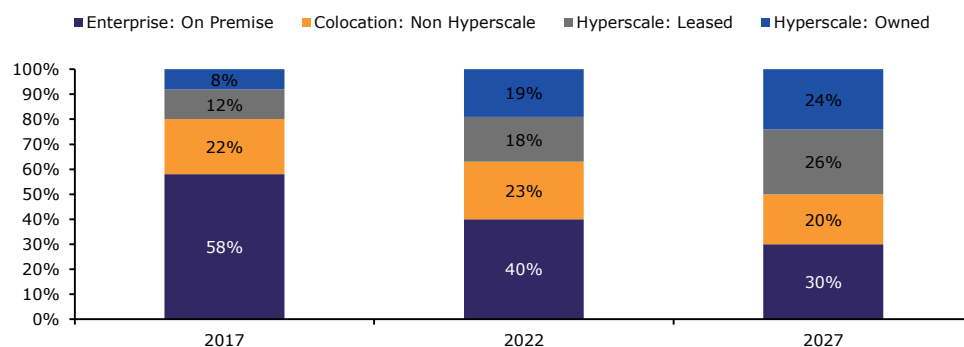
Source: Industry, Emkay Research

DC operators are increasingly foraying into emerging markets, especially those who score high on power availability, affordable land parcels and infrastructure capabilities for data center development. India specifically has seen remarkable growth in data center capacities in the last three years, driven by exponential increase in data consumption, coupled with improving regulatory framework and robust investments in the sector.

India has become one of the fastest growing data center markets in the APAC region, and ranks 14th globally in its data center inventory. Availability of land and power at affordable rates, attractive returns and robust demand from hyperscalers have made India one of the most sought after markets in the data center space.

(ii) Rising data center inventory

The supply of data centers is closely tied to new construction, and each region is currently experiencing unprecedented inventory growth. The expansion rates vary significantly, with Latin America/North America seeing a 15%/24% YoY growth, despite the latter facing a challenging base effect due to its dominant market size. Europe and Asia are following suit, with growth rates of 20% and 22% YoY, respectively. Demand is so robust that it is outpacing new supply.

Looking ahead, Asia is poised for the strongest growth, bolstered by a favorable base effect and a substantial pipeline of projects under construction, with the exception of Singapore.

Between 2023 and 2030, data center supply is expected to achieve a CAGR of 10% in the US, and ~10% in Europe. In the US, cities such as Atlanta (+19%), Portland (+15.5%), Phoenix (+15.5%), and Salt Lake City (+15%) are set to lead the expansion of market supply. Meanwhile in Europe, key cities driving growth include Frankfurt (+13.5%), Paris (+13%), Berlin (+12.5%), and Madrid (+11.5%).

Global presence is especially critical in the wholesale market as hyperscale service providers continue to chase world domination. Even in the co-location market, there is faster growth outside of the US, according to experts; international markets are in the more nascent stages of adopting hybrid cloud solutions and corporate data center outsourcing. Not to say that the US is no longer an attractive market as it matures, it is just that being global suggests faster and more profitable growth.

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Exhibit 58: Rankings of Data Center (Colocation and Hyperscale) providers; global players penetrating into other markets

North America

Rank	Name	No. of Data Center	Connectivity	Network Fabrics	Cloud On-Ramps
I	Equinix	90	3,497	505	111
II	Digital Realty	128	2,591	303	18
III	Core Site	38	1,766	157	43
IV	Cyxtra	48	1,329	236	2
V	Cologix	42	916	133	17

Europe

Rank	Name	No. of Data Centers	Connectivity	Network Fabrics	Cloud On-Ramps
I	Equinix	89	4,448	564	65
II	Digital Realty	116	4,914	524	50
III	KDDI	13	894	80	8
IV	Lumen Technologies	88	249	40	2
V	Global Switch	9	508	46	5

Asia

Rank	Name	No. of Data Centers	Connectivity	Network Fabrics	Cloud On-Ramps
I	Equinix	35	1,615	168	34
II	NTT Global	109	221	47	7
III	SuNeVision	8	429	39	4
IV	STT Global	17	106	17	10
V	Web Werks	8	579	14	-

Source: Cloudscene, Industry, Emkay Research

The continued growth in data center needs globally has led to an ever-growing development pipeline as formerly, secondary and tertiary markets rapidly scale. Several countries worldwide have already observed this development – for instance, with the strength of Frankfurt leading to development in Berlin and Munich in Germany, or an initial hub of Mumbai in India leading to growth in Delhi, Chennai, Hyderabad, and Bengaluru.

Supply chain concerns, existing during the pandemic, grew worse through the year. Certain projects experienced pauses in development, as specific component sourcing faced challenges. In other instances, developers began stockpiling certain components in expectation of further challenges. Disruption is to likely continue as an irritant over several years ahead, as further supply chains are constructed and vendors adjust manufacturing accordingly.

Exhibit 59: Global Market projected to clock 18.4% CAGR; India to outperform capacity addition

	Market Pipeline (MW)	Global	USA	EMEA	APAC	India
	Operational Capacity (2023)					
A.1	Colocation	22,387	8,909	4,659	8,819	
A.2	Cloud	9,635	6,835	1,286	1,514	
A.3	Others	1,601	1,076	273	252	
A	**Total Operational Capacity**	**33,623**	**16,820**	**6,218**	**10,585**	**966**
	Development Pipeline (2023-2028)					
B.1	Colocation	37,138	20,963	5,468	10,707	
B.2	Cloud	6,925	3,431	1,008	2,486	
B.3	Others	538	400	51	87	
B	**Total Development Pipeline**	**44,601**	**24,794**	**6,527**	**13,280**	**2,334**
	Total (2028)					
	Colocation	59,525	29,872	10,127	19,526	
	Cloud	16,560	10,266	2,294	4,000	
	Others	2,139	1,476	324	339	
C= A+B	**Total**	**78,224**	**41,614**	**12,745**	**23,865**	**3,300**
D = C/A	**Increase in Total Capacity vs Existing capacity**	**2.33**	**2.47**	**2.05**	**2.25**	**3.42**
E	**CAGR (2023-2028)**					
	Colocation	21.60%	27.38%	16.80%	17.23%	
	Cloud	11.44%	8.48%	12.27%	21.45%	
	Others	5.97%	6.53%	3.48%	6.11%	
	Total	**18.40%**	**19.86%**	**15.44%**	**17.66%**	**27.85%**

Source: Industry, Emkay Research

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(iii) Demand constantly expanding:

Digital Realty, in its Q2 2024 earnings presentation, indicated that global data center absorption (calculated as the difference between leased capacity and vacated capacity) has surged 40% in the past three years; this growth has outpaced the cumulative new supply by more than 50%.

Exhibit 60: Global data center – New supply vs absorption; Supply-Demand mismatch in favor of data center players
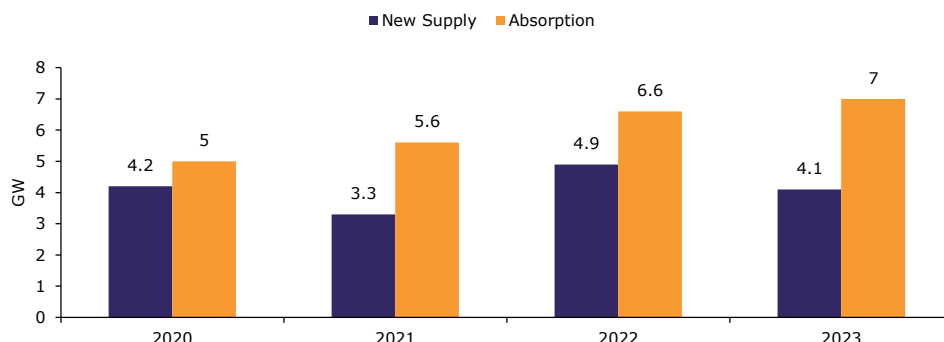
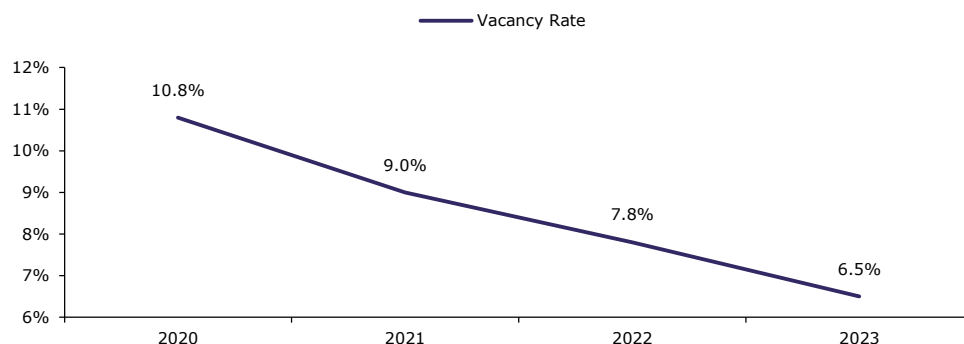*Source: Digital Realty, Industry, Emkay Research*

(iv) Vacancies at all-time lows

Data center capacity is measured in terms of IT power and available supply is assessed using the vacancy rate (available MW of IT power/total inventory of IT power). Over the past decade, vacancy rate has consistently declined from elevated levels, despite rapid construction growth. Prior to Covid-19, supply was relatively aligned with demand, even outpacing it in certain US markets.

Since 2020, an increased demand for digital services has driven a greater need for IT capacity among cloud providers, co-location operators, corporations, and governments. Simultaneously, global lockdowns disrupted supply chains across various industries, including construction and semiconductor manufacturing. These two trends (accelerating demand and constrained new supply) have placed significant pressure on data center capacity and power supply.

According to sources, the global data center vacancy rate has continued to decline, reaching 6.5% in 2023, down from more than 10% in 2020, as rising absorption outpaces new supply.

Exhibit 61: Global data center vacancy rate

Source: Digital Realty, Data Center Hawks, Industry, Emkay Research

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India's Data Center Market

(i) Regulatory tailwinds

■ **Regulatory push powering the acceleration**

India's regulatory framework for data centers is constantly evolving, with better transparency and structure, strengthening the data center ecosystem in India. In a significant development, data centers in India were granted infrastructure status by the government during the Union Budget FY2022-23. This move, applicable to data centers with over 5MW IT load in dedicated facilities, brings forth a host of advantages.

It not only simplifies access to institutional credit at favorable rates but also opens doors to foreign investments. Infrastructure status facilitates easier equity investment, opportunities for loan refinancing, and improved credit availability. This pivotal change promises to bolster the data center industry, attracting both domestic and foreign investments, ultimately paving the way for enhanced services and growth in the sector. Impact of granting infrastructure status to data centers:

- Easier access to institutional credit at lower rates

- Existing high-cost loans can be replaced with low-interest rate loans

- Attainment of 'Infrastructure' status, making equity investment more straightforward

- Opening avenues for foreign funding through external commercial borrowing

■ **National Data Center Policy**

The policy lays out a framework including various structural/regulatory interventions, investment promotion in the sector, possible incentivization procedures, along with the institutional mechanism required for governance. The draft policy offers incentives such as streamlined clearances, revised building guidelines, and a substantial Rs120bn scheme to attract investors and promote local equipment use. It encourages global equipment manufacturers to establish units in India and strengthens the testing and certification framework.

This policy extends benefits to both, private and public sector Data Center parks, developers, and operators. It establishes specialized Data Center Economic Zones (DCEZs) to foster an ecosystem for data centers, attracting investments and industry growth.

■ **Data Protection Bill**

In Aug-23, India's Parliament approved the Digital Personal Data Protection Bill, which introduces clear rules advising organizations to handle people's personal information in the digital age. It covers data processing within both, India and outside.

Data collected online or offline, and later digitized in India, as well as foreign companies offering goods or services within India, come under the ambit of this Bill. To use personal data, organizations must have a valid reason and obtain consent from individuals, ensuring data accuracy, security, and deletion when its purpose is fulfilled.

Along with data protection, the bill also limits cross-border data storage, encouraging local storage of country's data. This data localization is likely to intensify the demand for data centers in India in the next 2-3 years.

(ii) India's colo capacity and growth projections going ahead

While 2019-22 can be broadly identified as Phase-1 of the DC growth story in India, Phase 2 (2023-26) promises quantum acceleration in the growth trajectory. Simultaneously, with global players venturing into emerging markets, particularly those priding in superior power availability, cost-effective land parcels, and robust infrastructure capabilities, markets like India are primed for quantum growth in data center development.

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Exhibit 62: Key Industry Milestones

Source: C&W, Industry, Emkay Research

The data center sector in India has attracted substantial investments, amid contributions from global data center operators, real estate developers, and private-equity funds keen on tapping into India's burgeoning market. The sector's resilience and promising returns have made it a preferred choice with investors playing a dominant role.
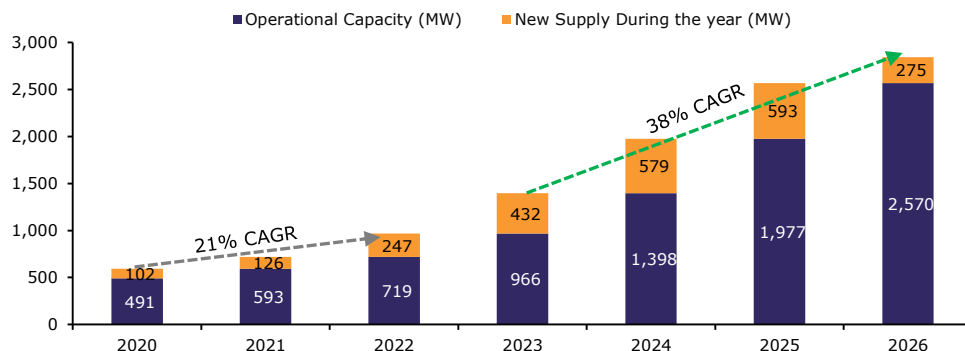
Although still at a nascent stage, India's DC market, spread across 13msf of real estate space in the country's top-7 cities, stands out prominently with 966MW of capacity as of end-2023. India's improving data center regulatory framework, marked by the recent grant of infrastructure status, is likely to enhance transparency and simplify credit access, further aiding growth and investments in the segment. With increased cloud adoption, major hyperscale players are expanding their presence in India, committing notable long-term investments in key markets.

Exhibit 63: **India Colo DC capacity addition and absorption in recent years; absorption rate declining owing to significant capacity addition**
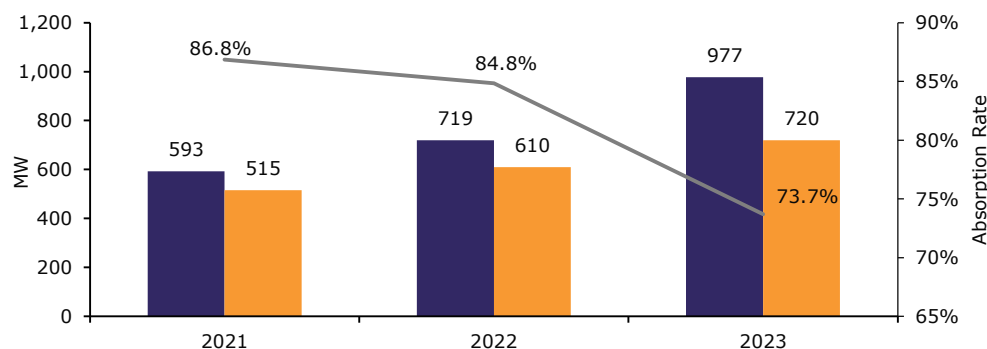
Source: C&W, Industry, Emkay Research

Capacity addition in the DC space has been rising every subsequent year post-Covid; 2022/2023 witnessed addition of ~247/432MW (+96%/+75% YoY); experts project DC colo capacity expansion at 38% CAGR (2023-26), arriving at 2.6GW by the end of FY26.

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Exhibit 64: Data Centre capacity trend; projecting 38% capacity addition CAGR (2023-26)

Source: C&W, Industry, Emkay Research

Exhibit 65: India Key Players DC IT Load ~966MW at end of 2023; top 5 DC operators command 76% market share
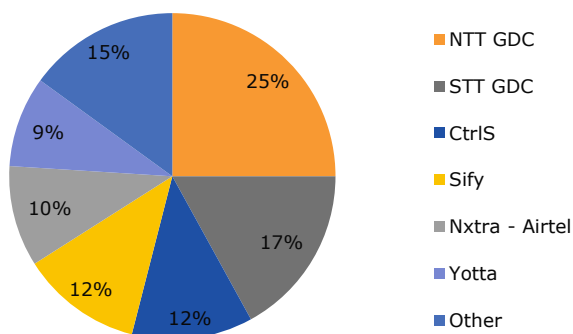
Source: C&W, Industry, Emkay Research

Exhibit 66: Key Players 2026 IT Load ~2,570MW; Anant Raj share projected to be ~2%
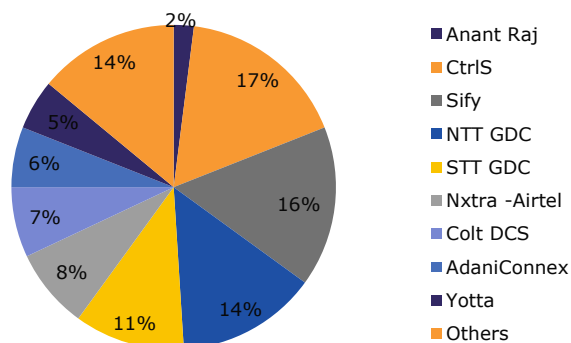
Source: Industry, Emkay Research

Of recent, enterprises that have a stronghold in India's colo market are NTT, STT, Nxtra, Sify, and CtrlS—collectively accounting for ~76% share. New entrants in the industry will help in diversification, bringing the much-needed volume of inventory. New entrants in the market will eat into the aforementioned players' market share; projecting market share declining to 66% by FY26.

(iii) Growth Drivers for India Colo Industry

Exhibit 67: Growth Drivers for India Colo Capacity

Source: Industry, Emkay Research

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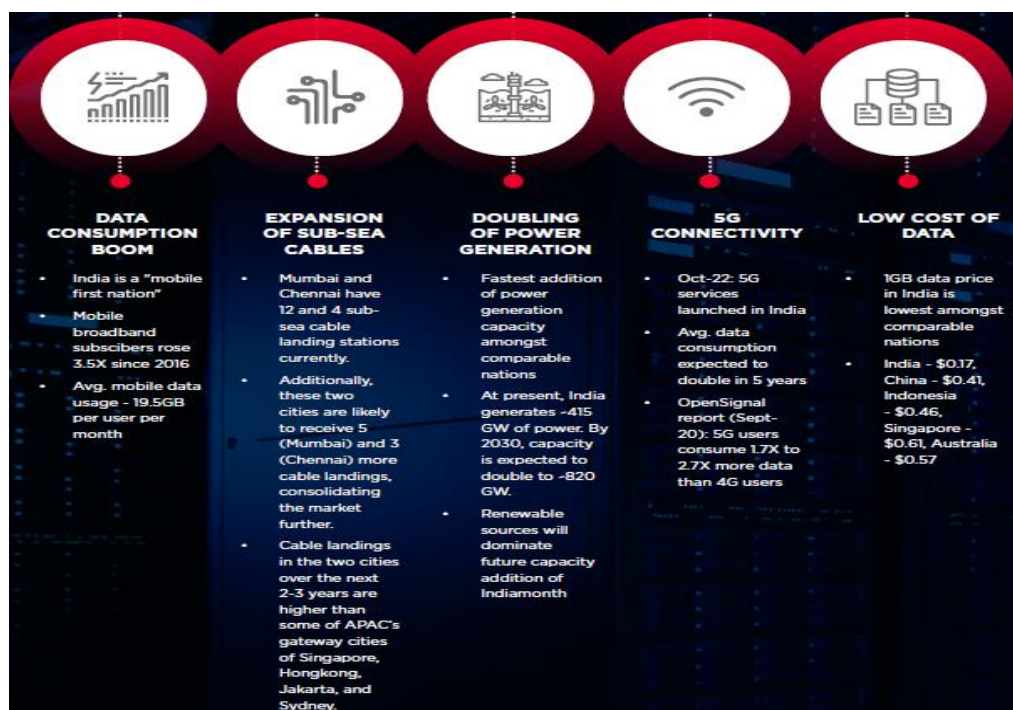
■ **Data Consumption Boom**

India's PetaB/MW (PB/MW) ratio of 13.2, though better than Indonesia's (18.8 PB/MW), trails other countries, including China. While Indonesia is forecasted to have a PB/MW ratio of 9.1, India's will be lower at 9.0. As of 2028, India is estimated to have 3.3GW of total installed colo capacity (IT load), albeit its PB/MW ratio of ~9.0 will remain lower among comparable nations.

Exhibit 68: PB/MW ratio for India, Indonesia, and China (2023-2028)

| Mobile data consumption approach	Mobile Data usage (GB/user/mth)	Share of smartphone users	Population (mn)	Smartphone users (mn)	Mobile data(P3/mth)	Installed DC Capacity (MW)	PB/MW Installed Capacity
India 2023	19.5	46.5%	1,423	662	12,906	977	13.2
India 2028F	29.3	66%	1,487	981	29,634	3,299	9.0
China 2023	14.1	71.8%	1,412	1,014	14,293	3,208	4.5
China 2028F	21.2	82.8%	1,404	1,163	24,592	5,721	4.3
Indonesia 2023	16	80.2%	275	220	3,527	188	18.8
Indonesia 2028F	24	90%	287	259	6,212	682	9.1

Source: C&W, Industry, Emkay Research

India has the lowest penetration of Internet, smartphones, OTT, and social media users among comparable countries. However, market estimates suggest India is likely to witness steep growth in digital adoption, a significant data consumption driver. Interestingly, even after exhibiting such high growth in digital adoption until 2028, India will still have room to grow to reach the penetration levels observed in other countries.

Exhibit 69: Global Internet Penetration
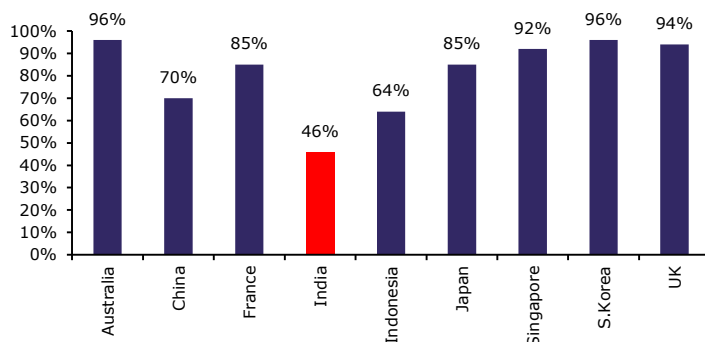
Source: C&W, Industry, Emkay Research

Exhibit 70: Global Smart Phone Penetration
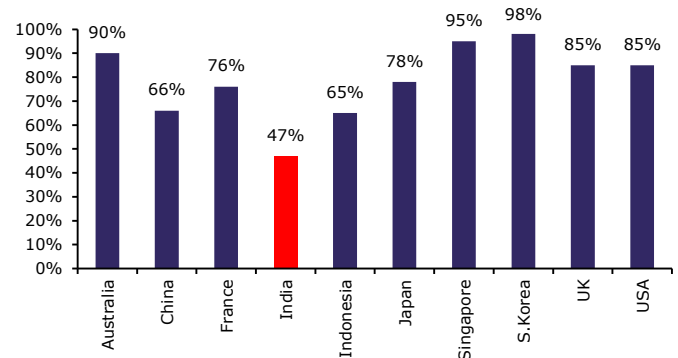
Source: C&W, Industry, Emkay Research

Exhibit 71: Global OTT Penetration
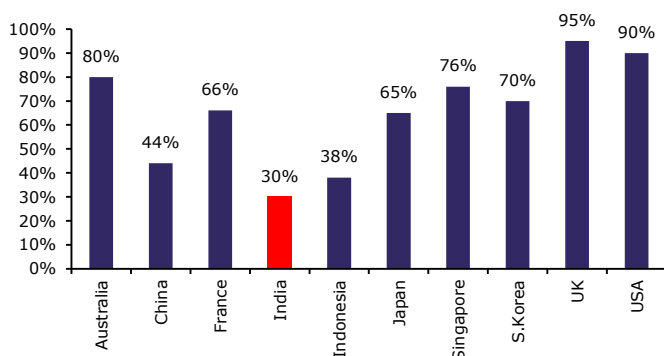
Source: C&W, Industry, Emkay Research

Exhibit 72: Global Social Media User Share

Source: C&W, Industry, Emkay Research

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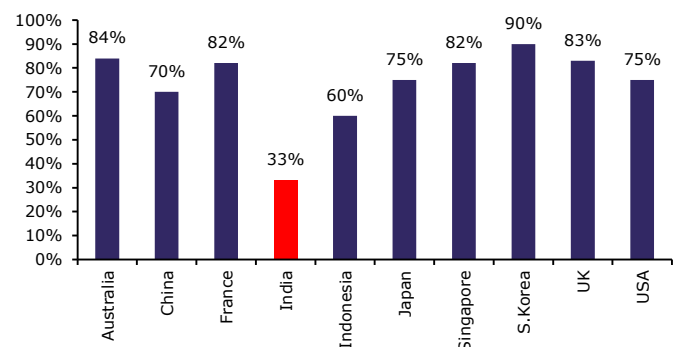
Exhibit 73: India's digital adoption to witness a multi-fold rise
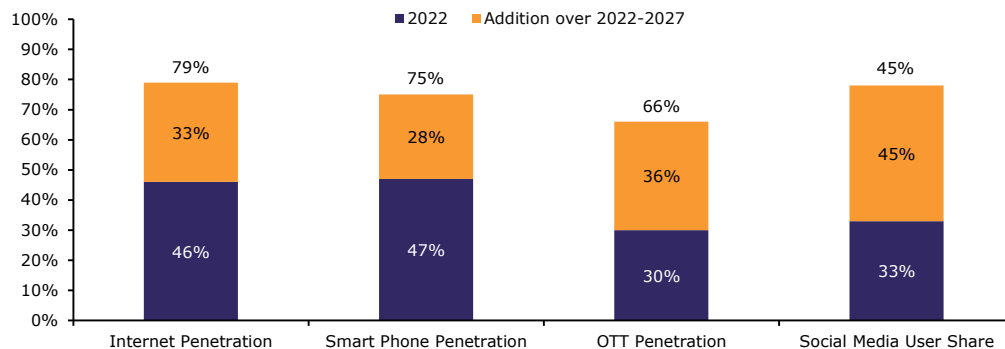
Source: C&W, Industry, Emkay Research

■ **Expansion of Sea-Cables**

Submarine cables are the backbone of the internet, carrying 99% of all international telecommunications traffic for personal, business, and government use; **there are ~450 in-service submarine cable systems around** the world, spanning over 0.85mn miles, forming a critical part of the internet's infrastructure. As of end-2022, TRAI reported 17 international subsea cables across the five Indian cities of Mumbai, Chennai, Cochin, Tuticorin, and Trivandrum.

As demand for data continues to grow, driven by mobile device usage, cloud computing, and new wireless technologies like 5G, the amount of data traveling across this physical submarine cable infrastructure has increased rapidly in tandem. Among the leading cities in APAC, Mumbai and Chennai are expected to witness a substantial increase in sub-sea data cables. This infrastructure development will not only enhance cross-border data connectivity with India but also pave the way for India to become a hub for data storage within the region/sub-region.

Exhibit 74: Expansion of Sub-Sea Cables

Country	APAC Gateway Cities	Current no of Sub-Sea cables	Expected no of Sub-Sea cable addition (2023-2026)
India	Mumbai	9	5
India	Chennai	6	3
Singapore	Singapore	7	2
China	Hong Kong	10	2
Indonesia	Jakarta	1	3
Australia	Sydney	5	2

Source: Industry, Emkay Research

■ **5G Connectivity**

India has over 850mn internet users, almost twice that of the USA and about 12x higher than that of the UK. However, data center space per 1mn of internet users in India stands significantly low compared with established markets. As data localization becomes a norm, India's data center market is likely to witness accelerated growth, opening enormous opportunities for developers and operators in the space in the next 2-3 years.

Exhibit 75: Growth Of Mobile Broadband subscribers

Source: Industry, Emkay Research

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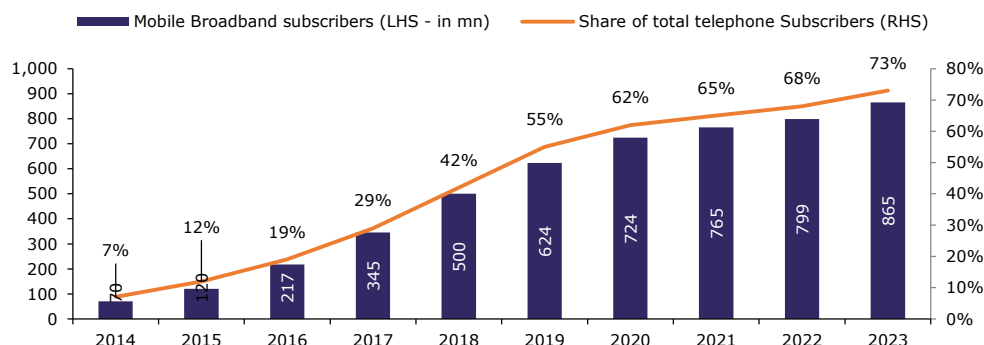
When comparing the number of internet users in year 2023 with the installed colo capacity for the same year, a huge amount of under-penetration is noticed – only 0.6mn internet users/MW in India. With an installed capacity of 188MW currently, Indonesia's ratio (0.9mn/MW) is the nearest gauge for India. On the other spectrum is Singapore, where every 1MW of installed colo capacity exists for mere 6,000 internet users. Other countries, including China, are way ahead of India, in terms of internet users/MW ratio.

Exhibit 76: Internet Users/MW of installed Colo capacity across countries (2023 vs 2028)

Country	2023		2028				2023-2028 Colo Capacity CAGR	2023-2028 Internet users CAGR
	Installed Capacity (MW) 2023	Internet Users (trn)	Internet Users/MW	Installed Capacity (MW)	Internet Users (trn)	Internet Users/MW		
Australia	1,043	25	24,335	2,321	27	11,480	17.3%	1.0%
China	3,208	1,041	324,420	5,721	1,166	203,735	12.3%	2.3%
France	632	56	88,608	1,278	62	48,513	15.1%	2.1%
India	977	657	672,639	3,299	1,011	306,460	27.6%	9.0%
Indonesia	188	172	915,272	682	233	341,210	29.4%	6.2%
Japan	1,133	102	90,322	2,748	114	41,336	19.4%	2.1%
Singapore	677	5	8,085	853	6	6,550	4.7%	0.4%
South Korea	473	51	107,290	1,186	50	42,439	20.2%	-0.2%
UK	1,202	66	54,663	2,228	67	30,162	13.1%	0.5%
USA	8,201	313	38,141	10,883	321	29,513	5.8%	0.5%

Source: C&W, Industry, Emkay Research

India is currently counted among the smallest user bases for 5G coverage; understandably so, because 5G services were launched relatively late, in Oct-22. However, since its introduction, the 5G user base has witnessed considerable growth and is likely to reach ~47% by 2028. 5G data users consume nearly twice the data consumed by other users. This is a big boost for the demand for data services, including secure data storage.
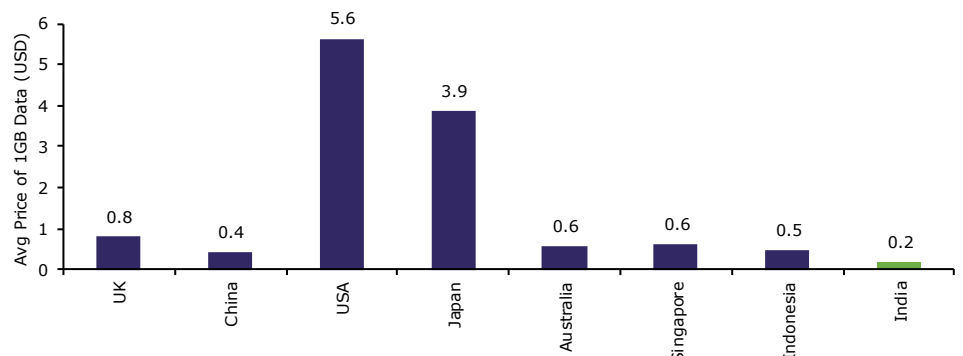
Exhibit 77: Current 5G coverage(% of Population)
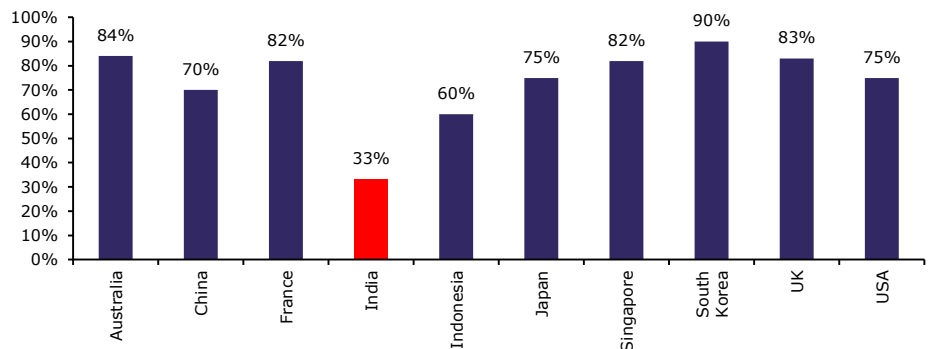
Source: C&W, Industry, Emkay Research

■ **Low Cost Of Data**

Exhibit 78: India's low cost of data is one of the major drivers of the high data consumption in the country; advantage likely to prevail in coming years as well

Source: C&W, Industry, Emkay Research

Adding to the multiple growth drivers highlighted in Exhibit 67 (Page 38), we also believe that India is home to a large number of MNCs, listed domestic companies (Exhibit 161; Page 82), well established private companies, and a booming market for upcoming start-ups. India's growth story culminating into expansion of businesses across its geography makes a strong case for Data Center providers to onboard them, provided they choose to migrate their IT infrastructure.

Co-location DCs provide IT space and services to three types of customers in a professional manner:

- **Direct customers:** Direct customers, as mentioned above, are companies, governments and NPOs migrating their IT equipment to a professional data center. By outsourcing IT, they save on IT costs, increase continuity and guarantee the physical safety of the equipment. Moreover, there are more possibilities in terms of scalability and flexibility.

- **SaaS providers:** SaaS is a mode wherein a user does not have to install an application on their own computer or other device. SaaS providers often use a DC on their site to manage the IT infrastructure and the platform on which the application runs.

- **Hosting and cloud providers:** Hosting and cloud providers offer digital infrastructure and a platform for services to third parties. IaaS and PaaS service providers, which customers use for the development, execution and management of applications without having to think about the complexity of building and maintaining the infrastructure, are also associated with DC providers.

Tapping into domestic listed companies could enhance customer base for DCs in India
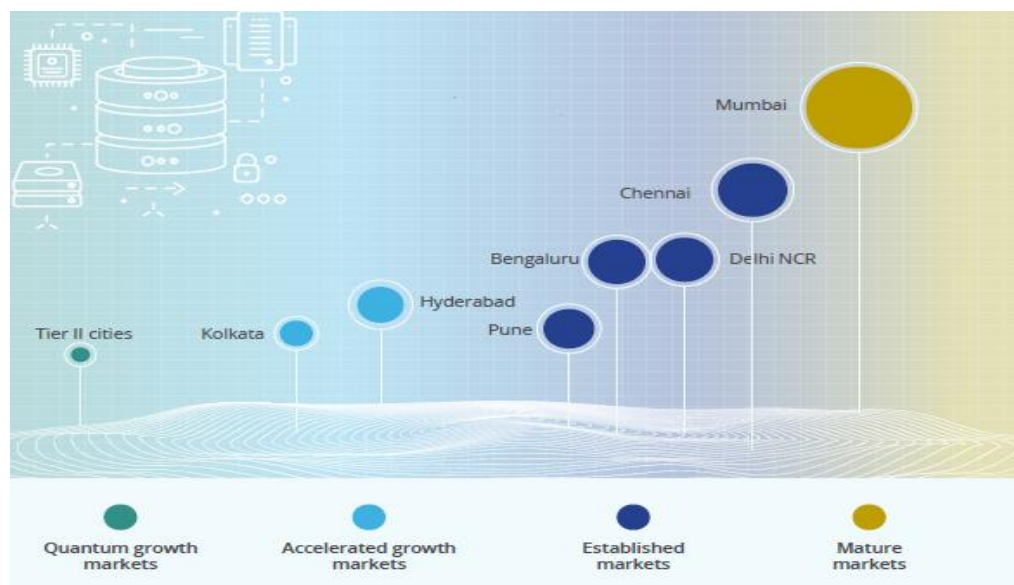
Exhibit 79: Recent Transaction details

City	Tenant	Power
Delhi NCR	Speed Sign	250kW
Delhi NCR	Garena	1MW
Delhi NCR	Bank of India	1MW
Delhi NCR	Passport Seva Kendra	200kW
Delhi NCR	Hero Motocorp	150kW
Delhi NCR	DE Shaw	100kW
Delhi NCR	Uno Minda	50kW
Mumbai	Paytm	350kW
Mumbai	IBM	300kW
Mumbai	Bandhan Bank	200kW
Mumbai	Optiver	50kW
Mumbai	Canara Bank	1 MW
Mumbai	Union Bank of	1 MW
Mumbai	Bank of India	1 MW
Chennai	Flipkart	1.4MW
Hyderabad	ConvergeOne	25kW
Hyderabad	Aon Consulting	250kW
Hyderabad	Ujjivan Bank	800kW
Banaglore	Zoho	500kW
Banaglore	Mobilium	300kW
Banaglore	Meta	1 MW
Banaglore	Digital Ocean	3 MW

Source: C&W, Industry, Emkay Research

India's city-wise DC analysis

Mumbai remains the most evolved data center hub, hosting half of India's data center capacity. Mumbai also features in the top-5 APAC markets. While Chennai, Bengaluru and Delhi-NCR are already relatively established markets, notably, Kolkata has potential of being a zonal data center hub for eastern India.

Delhi-NCR's rise in the DC landscape of the country is in a way correlated with data storage requirements of the entire North zone. Hyderabad and Pune currently correspond to a 5-10% share of the total data center capacity in India, and are likely to witness robust growth in coming 3-4 years owing to supporting infrastructure and encouraging regulatory framework.

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Exhibit 80: Overall India Colo DC market is at a nascent stage

Source: Colliers, Industry, Emkay Research

Exhibit 81: India DC capacity – Current: 966MW; Under construction: 1GW; Planned: 1.3GW; Total (2028): 3.3GW

Source: C&W, Industry, Emkay Research

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Exhibit 82: City Wise Analysis of DC Market; Mumbai will maintain the lion's share in the DC Colo market

Particulars	Mumbai	Delhi NCR	Chennai	Hyderabad	Pan-India
Colo Capacity - 2023 (MW)	531	113	144	36	966
Current Share of DC Capacity	**54%**	**12%**	**15%**	**4%**	**100%**
Under Construction (MW)	301	109	182	92	1,030
Planned (MW)	916	139	152	261	1,290
Total Projected Capacity - 2028 (MW)	**1,748**	**361**	**478**	**389**	**3,297**
Share of DC Capacity	**53%**	**11%**	**14%**	**12%**	**100%**
Capacity CAGR (2024-2028)	34.7%	33.7%	35%	81.3%	35.5%
Racks as of H2 - 2023 (no of units)	70,000	16,500	18,000	6,400	
Avg size per rack (kVA - Computed)	**7.6**	**6.8**	**8.0**	**5.6**	
Colo Vacancy	28%	25%	30%	17%	26.3%
Colo Vacancy (MW - Computed)	**148.7**	**28.3**	**43.2**	**6.1**	**257.0**
Cable Landing (no of units)	9	0	6	0	
New Sea-Cable addition (2023-26)	5	0	3	0	
Expected Sea-Cables (2026)	**14**	**0**	**9**	**0**	
User Demand (%)					
Hyperscale	61	47	57	5	50
BFSI	15	15	18	55	20
Technology	7	10	13	18	11
Telecom	4	8	3	12	6
Others	13	20	9	10	17

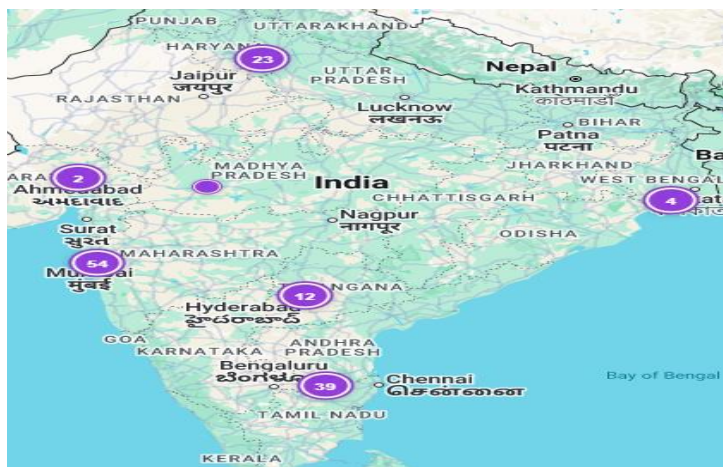| Key Data Center Hubs	Thane-Belapur Road Rabale Chandivali	Noida Manesar	Siruseri Ambattur	Gachibowli	

Source: JLL, C&W, Industry, Emkay Research

Exhibit 83: 81MW absorption in H2 2023 over 72MW in H2 2022
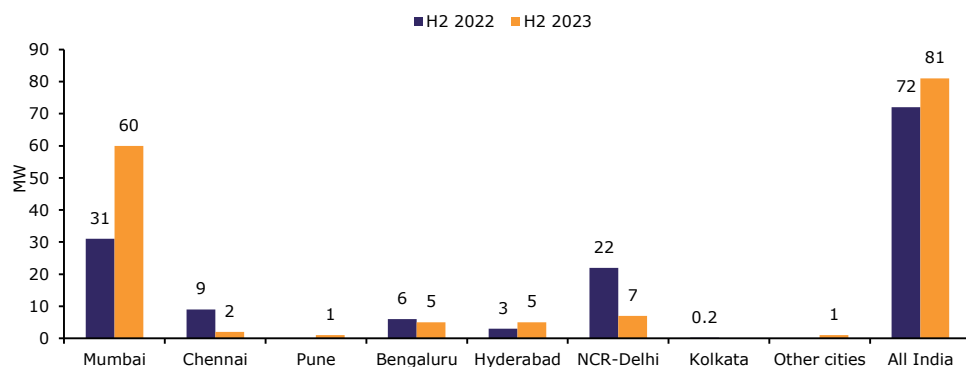
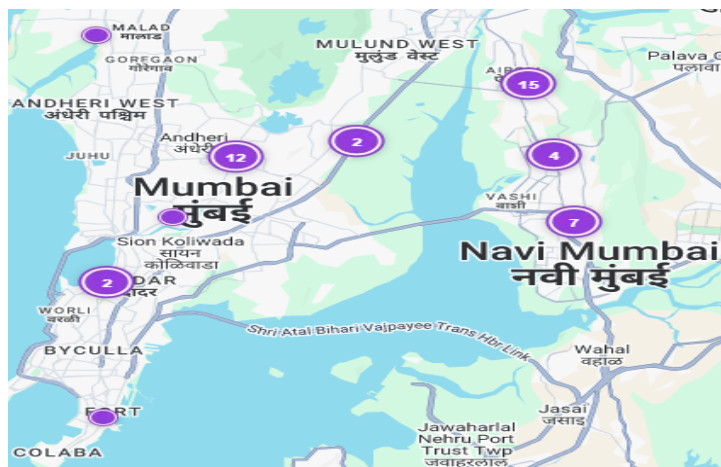*Source: Industry, Emkay Research*

Exhibit 84: India – Top Data Center markets

State	No of DCs	Top Colocation providers
Maharashtra	54	Yotta, Equinix, Web Werks (Iron Mountain), NTT Global, CtrlS, Nxtra
Karnataka	20	Zenslayer, NTT, Iron Mountain, Nxtra
Tamil Nadu	19	Digital Realty, Zenslayer, Sify, Nxtra
Uttar Pradesh	17	Zenslayer, NTT, Iron Mountain, Nxtra
Telangana	12	Zenslayer, Iron Mountain, STT, Sify, Ctrl S
Delhi	5	Yotta, STT, Nxtra, Anant Raj, Sify
West Bengal	3	Sify, Zenslayer, STT
Gujarat	2	STT, Synoptek

Source: Industry, Emkay Research

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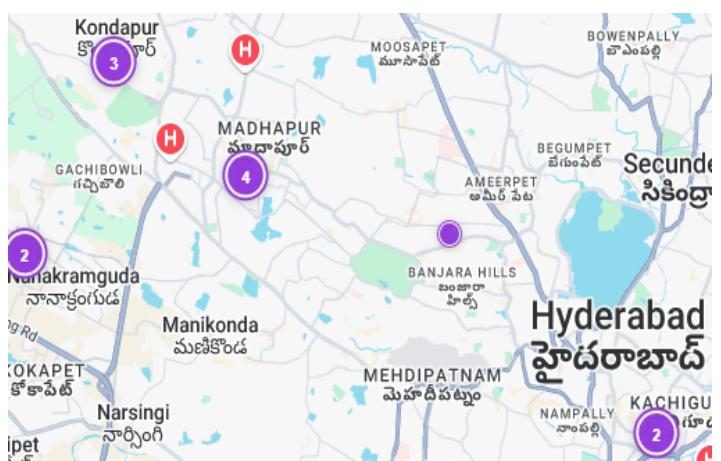**Exhibit 85: Pan India – 11 States, 135 DCs, 29 providers**

Source: Industry, Emkay Research

Exhibit 86: Mumbai – 46 DCs, 20 providers

Source: Industry, Emkay Research

Exhibit 87: Chennai – 19 DCs, 12 providers

Source: Industry, Emkay Research

Exhibit 88: Hyderabad – 12 DCs, 11 providers

Source: Industry, Emkay Research

Upcoming Tier II cities

While Tier-I cities in India are on the rise, there are promising returns on investment and growing demand for DCs in close proximity of data consumption centers which will eventually result in quantum growth of the DC market in the tier II cities of the country.

With only 4% of India's data center capacity in Tier-II cities, the potential for growth is significant as businesses opt for smaller towns. As consumer-centric businesses like banks and OTT companies seek proximity to their customers, data center demand in Tier II cities is likely to accelerate. Tier II cities such as Ahmedabad, Jaipur, Kochi, Nashik, and Vijayawada are steadily witnessing growth due to their strategic location and infrastructure (including power, fiber, and cable connectivity) upgrades. Tier II cities offer valuable disaster recovery advantages, ensuring secure backup for critical operations.

Edge data centers to gain traction soon

As lower-latency processing demand grows, edge data centers present a promising investment opportunity. Rising demand for edge DCs is driven by IoT, big data, AI, cloud, OTT, streaming, and 5G technologies as they provide reduced latency, real-time analysis, enhanced app performance, and business agility Leading operators are establishing edge data centers not only in Tier I cities but also in Tier II cities.

India is expected to add another 400-500 edge DCs in the next 5 years across multiple cities. Edge DCs will support the sustainable transition of DCs through smaller footprint and lower energy consumption.

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India DC industry capex going ahead

India's data center market has experienced remarkable growth post pandemic, attracting about USD7bn of total investments since 2020. These investments are from global data center operators, real estate developers, and private-equity funds looking to expand into India. Global institutional investors and developers have been increasingly partnering with data center operators for operational expertise and market experience in data center development.

Foreign investments have helped data center operators achieve the desired scale, foray into new markets and achieve development and operational expertise by providing access to capital. As the data center market grows bigger, the sector will is likely to witness allocation of more foreign capital, as global investors will look for acquiring stake in quality assets for long-term returns.

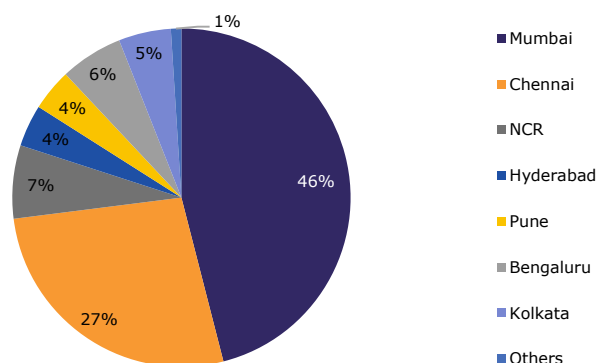Investors are attracted to India's data center market on account of multiple reasons:

- Strong growth prospects owing to increased cloud adoption, digital penetration and generative AI

- Robust demand from Hyperscalers and Tech, BFSI occupiers

- Relatively low land, labor and construction costs compared with other markets

- Indian data center operators are increasingly focusing on sustainability through energy-efficient technologies to reduce energy consumption

- Attractive yields of 16-17% vs 7-10% in retail, office and the warehousing sector

Exhibit 89: Basis respective assumptions, we believe India will witness ~USD12bn investment in the DC industry during 2024-2028

Capex Brownfield/Green-field	Costing (Rs mn/MW)*	2023 DC Capacity	Capacity Addition (2023-2028)	Projected share in capacity addition	Projected Capex (Rs bn)	Projected Capex (USD bn)#
Brownfield capacity	260		348	15%	91	1.1
Brownfield capacity (ex-bldg)	340		348	15%	118	1.4
Greenfield capacity	500		1,626	70%	813	9.8
Total		**977**	**2,323**	**100%**	**1,022**	**12.3**

Source: Industry, Emkay Research, Note: * = Assuming costing/MW remains constant over 2023-2028; # = Assuming USD/INR rate of Rs83

Exhibit 90: USD 5.7bn capex projected by experts during 2024-26

- Mumbai 46%
- Chennai 27%
- NCR 7%
- Hyderabad 4%
- Pune 4%
- Bengaluru 6%
- Kolkata 5%
- Others 1%

Source: JLL, Industry, Emkay Research

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## Rentals for accessing DC services

Primary markets with mature data center ecosystems offer fairly transparent occupier market indicators such as inventory, absorption, and available supply. Nevertheless, there are persistent obstacles that are the reason for the opacity on rent and yield:

- **Complexity and rapid evolution of occupier needs:** Rent is typically contingent on the type of service availed by customers. For instance, charges for storage services cannot be compared to the services taken up for running as generative AI on a DC.

- **Oligopolistic structure of the market:** With a small number of players holding a large market share – for instance, co-location players in the US market (Equinix, Digital Realty and NTT) are relatively close to cloud service providers (Amazon, Microsoft, and Google) – do not need third party assistance to lease data centers.

- **Churn rate considerably low:** There are a few release transactions to analyze. To add on, most data centers belong to companies that have developed them rather than purchased them (multiples of 2019-2024 transactions listed in (Exhibit 103, Page 54), further reducing the peer group size while computing the valuation for data centers.

Exhibit 91: Global DC colocation market size by country in primary, secondary, and emerging markets (Jun-23)
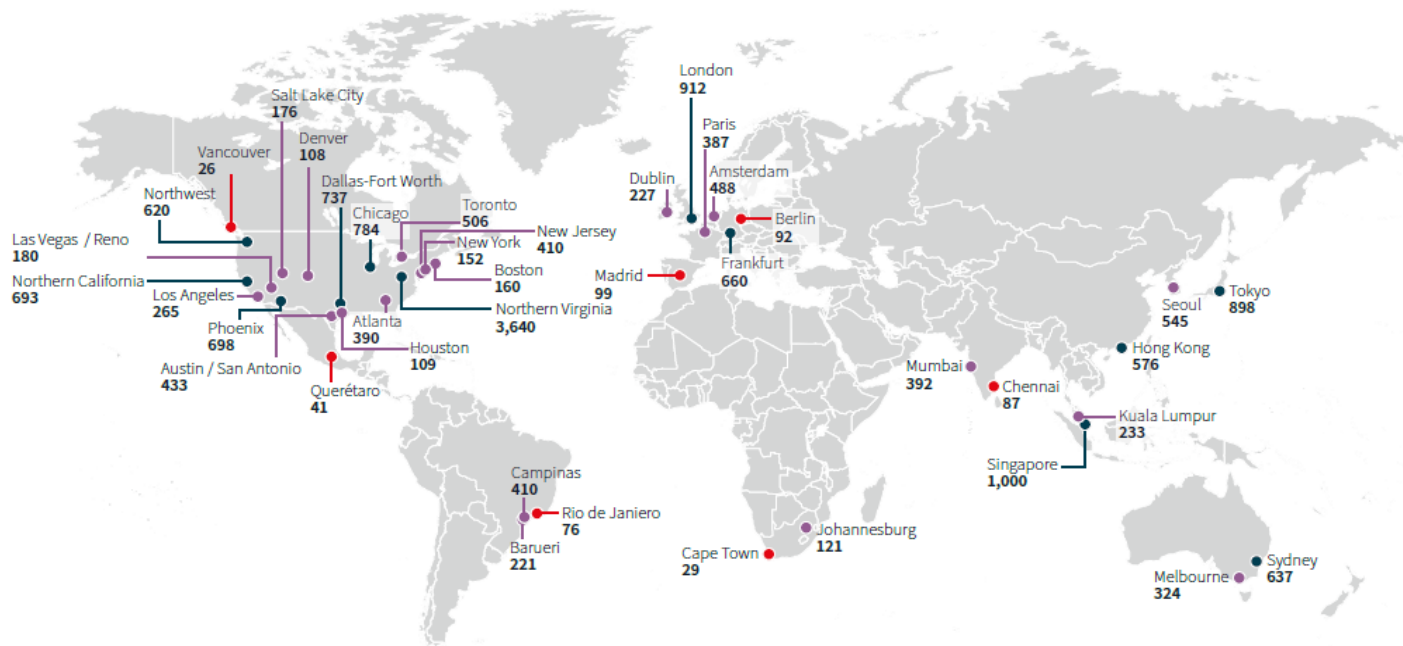
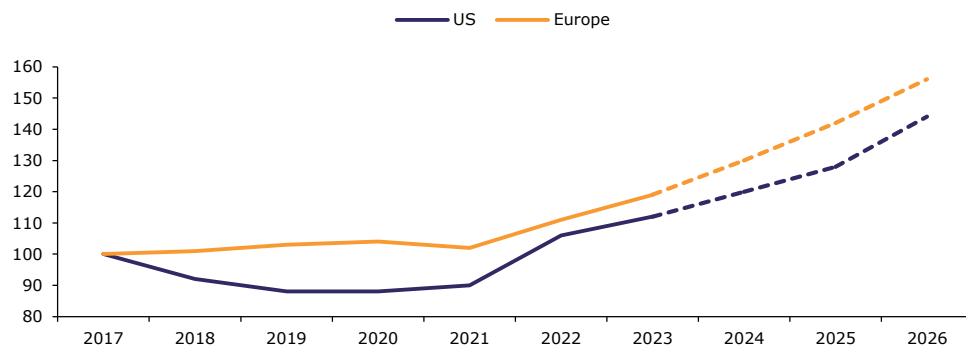
Source: JLL, Industry, Emkay Research

Demand-supply-imbalance triggers rent growth:

To grasp the current levels and trends of market rents in the data center sector, it is essential to recognize three unique characteristics that set it apart from other commercial real estate sectors:

- Rents are typically expressed in terms of kilowatts (kW), excluding electricity costs, which are billed separately. The main wholesale rent range falls between 250kW and 500kW. As is common in many markets, volume discounts apply: contracts for IT power exceeding 500kW are priced lower, per kWh, while contracts below 250kW tend to be more expensive per kWh.

- Market rents are closely tied to construction costs, as rental rates reflect the return on total development cost. Following a period of relative stability prior to Covid, rents have recently surged globally, driven by high demand.

- Data center wholesale rents also represent a service fee for tenants, facilitating the effective operation of their IT systems. This approach differs from the more traditional rental agreements typically seen in commercial real estate.

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According to industry professionals, we have entered a phase of market rent growth, a trend that is set to continue at a high single-digit rate due to the shortage of supply and persistent inflation.

Exhibit 92: Market rent indices for the US and Europe
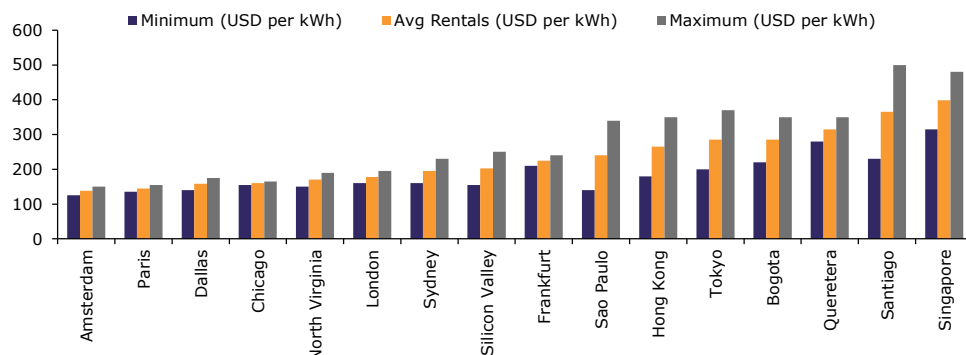

Source: Industry, Emkay Research; Note: 100 = 2017

Exhibit 93 illustrates that Europe has the rental rates, at ~USD171/kW, slightly below the US at USD173/kW. However, this comparison does not account for the total occupancy cost, which includes electricity prices. Importantly, Europe faces the highest electricity costs among major regions. Consequently, lower energy prices often lead to higher rental rates. This dynamic is one reason why data center operators emphasize Power Usage Effectiveness (PUE). In our assessment, US rental levels remain relatively low due to historically high supply levels.

Singapore, the world's most power-constrained market, has only 7.2MW of available capacity and a record-low 1% vacancy rate. Rentals in Singapore are high due to a number of factors, including i) limited land, ii) high real estate costs, iii) power constraints. Nevertheless, Singapore continues to be a leading data-center hub for its regional and global connectivity.

Exhibit 93: Monthly pricing range for 250-500kW (min-max)*

Source: CBRE, Industry, Emkay Research; Note: * = ex Electricity Cost

Co-location rentals in India

Colocation rentals tend to be subjective in nature, depending on the varied requirements of each customer. Demands by clients include different number of racks required, rack density, power requirements, etc. As pricing varies from customer to customer, colocation service providers arrive at quotations based on client needs.

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Exhibit 94: DC operator Questionnaire for Colocation service needs of client

Particulars	Responses
No of Racks	No of racks in 'U' (where 1 rack is 1 U)
Rack Density	kW
Peak Load each rack	kW
Power feed	Single/Dual
Power Socket	1-Phase/3-Phase
Rack Power Distribution Unit (PDU) requirement	Yes/No
Height of Rack	Basis the server size
Dimension of Racks	600 x 1,200, 800 x 1,200, 600 x 1,100, 800 x 1,100, 600 x 1,000, 800 x 1000
Cage type	Opaque/Mesh
CCTV requirement	Yes/No
Access Control System requirement	Biometric/Card Reader/Both
Future rack reserved space requirement in Cage	Yes/No
Other specific requirements	
Connectivity Requirements	Internet Bandwidth, Cross Connects

Source: Industry, Emkay Research

Co-location services are typically priced according to the physical space that a customer occupies in the data center, how power is delivered to the customer's equipment, as well as a one-time installation fee.

▪ **Space:** Colocation space is sold on the basis of individual cabinets or cages, typically for the short-term, with 1-3-year license agreements, as opposed to long-term leases. Customers pay colocation service fees on a monthly basis for their cabinet or cage space in these colocation facilities.

▪ **Power:**

Breakered-Amp: Customer pay a fixed monthly fee for contractually committed amounts of power per month. Importantly, the customer must pay in full, regardless of how much power is actually used. Breakered-amp power is sold in shared areas of data centers and is included in the total cabinet price.

Sub-Metered: Customer makes monthly payments for actual power usage in arrears on a metered basis. This includes the power attributable to the customer data center equipment as well as an allocation for the power used to provide cooling, lighting, and security for the data center. Sub-metered power is sold to customers that contract for dedicated space, such as a cage or private suite, for which they are charged on a per-square-foot basis.

Majority of the customers prefer paying a fixed fee for power consumption.

▪ **Installation:** Installation fees are one-time in nature and relate to a customer's initial deployment of equipment and IT infrastructure to a colocation. The DC provider performs professional services, which are typically billed on the first invoice sent to the customer.

Now that we have established that pricing in colocation tends to be dynamic in nature, Exhibit 95 highlights the average/kW monthly rentals being charged across different cities in India. Typically, the lower the space requirement by the client (sub-250kW), the higher the charges on relative terms, owing to greater pricing power with the provider; it is the inverse in case a customer demands higher rack space (250kW-1MW, 1-5MW, >5MW).

Exhibit 95: City-wise co-location rentals in India

Rental detail	Mumbai		Delhi NCR		Chennai		Hyderabad	
Monthly recurring charges (USD)	Low	High	Low	High	Low	High	Low	High
Sub 250kW	105	125	105	120	100	120	100	120
250kW-1MW	100	120	90	100	95	115	95	115
15MW	85	110	85	105	85	95	85	95
>5MW	80	105	80	100	80	90	80	90

*Source: JLL, Industry, Emkay Research; Note: * = The pricing here assumes standard racks of 5kVA-6.5kVA without any customization*

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We interacted with multiple DC colocation service providers for gaining perspective about on-ground rentals being charged. Colocation, typically a commoditized service offering, has minimal differentiation offered by multiple players. Nevertheless, we believe certain critical factors are considered by customers before finalizing and signing a lease with a DC provider (Exhibit 96).

Exhibit 96: Important criteria, from the customer point of view

Criteria	Requirement
Ranking of the respective DC	Whether DCs are one of the top service providers in their respective regions
Clientele base of the service provider	Whether service providers have on-boarded foreign or domestic companies
Point-to-point internet connectivity	Whether DCs have tied up with multiple telecom service providers. Dependance on only one telecom provider tends to be relatively riskier

Source: Industry, Emkay Research

Understanding Yields

### Why investors across the globe are entering data centers

We believe that data is the new gold, serving as the raw material for a digital economy. This assertion is especially pertinent given the transformative potential of AI in our daily lives. As data centers are the hubs where data converges, they are attracting significant interest from investors and will continue to do so.

Properly valuing a data center requires the integration of several critical factors that address both real estate fundamentals and the specialized operational needs of this asset class. The following considerations provide a framework to ensure accurate valuation.

■ **Market Maturity and opacity**

Global real estate brokerage company JLL states that data centers are the best of the emerging real estate sectors in terms of investment volume and data availability. Nevertheless, we find them more opaque than most commercial real estate sectors.
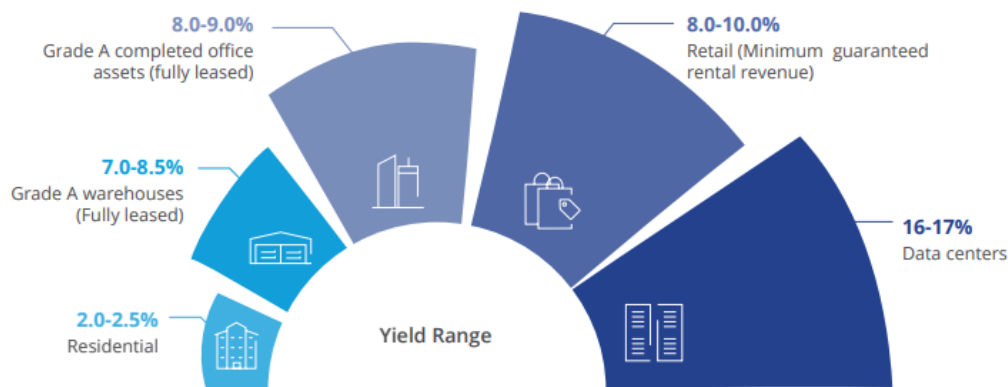
Exhibit 97: Transparency map for emerging property sectors
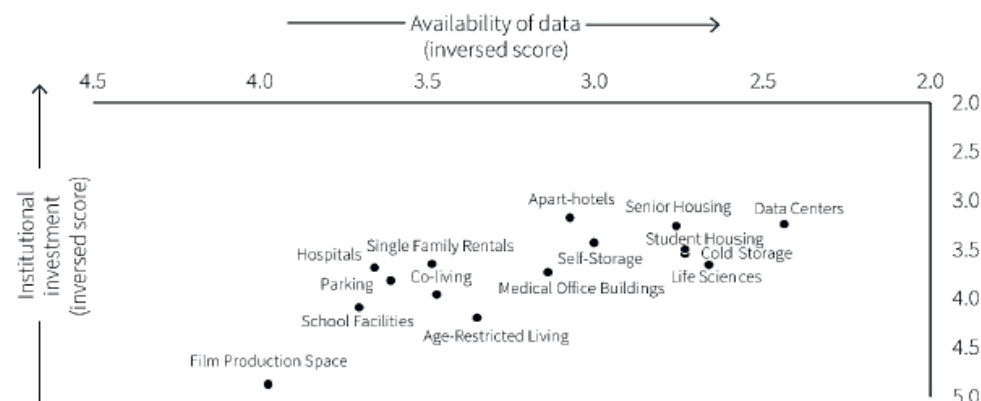
Source: JLL 2024, Industry, Emkay Research

■ **High-yield asset class**

Data centers represent a high-yield asset class because of the peculiar risk that leads investors and operators to demand a decent risk premium to compensate for the risk of obsolescence of the technical equipment and the highly operational nature of the business. Though acquisitions are a relatively faster way of expanding reach into new markets, industry experts believe that development rather than acquisitions of DCs will be the dominant source of external growth over the next few years. Building in 9-11% yields for hyperscalers and 12-16% for colocations generates immense value vs buying at 6.5% cap rate for hyperscale and sometimes sub 5% for highly connected, network dense data centers. With strong demand trends, pre-leasing of development helps de-risk such ventures.

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Exhibit 98: Gross Yields across real estate segments

Source: Colliers, Industry, Emkay Research

■ Contractual rent growth

Long-term leases with fixed rent increases are a crucial consideration in data center valuation. Most data centers lease space to tenants with fixed rent escalations of 3% to 5% per annum, providing stable, predictable cash flow growth over time. This is particularly relevant with the normalization of the inflation rate.
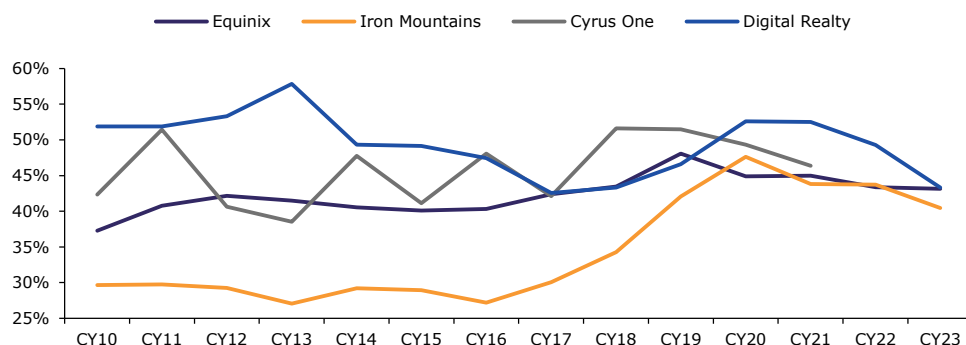
■ Operational expenditures

Data centers are operationally intensive, with significant costs associated with electricity, cooling, and maintenance. Consequently, electricity costs and power availability remain paramount concerns, especially as global demand for AI and cloud services continues to rise.

OPEX considerations include energy efficiency metrics such as Power Usage Effectiveness (PUE). Lower PUE scores indicate more efficient facilities in terms of power leakage to non-IT purpose. This means a reduced all-in cost for the occupier. From an investment point of view, all other things being equal, this leads to higher rents and improved profitability, making energy-efficient centers with low PUE more attractive.

■ Maintenance capital expenditures burden

Maintenance capital expenditures (capex) for data centers are generally higher than those for traditional real estate assets due to the ongoing need for monitoring and upgrades to critical equipment such as racks, cabling networks, power units, and cooling systems. From an investment perspective, it is crucial to account for these capex costs, as they can erode net income over time. According to industry experts, the annual maintenance capex budget typically ranges from 2-5% of asset value, depending on the level of operational leverage.

Exhibit 99: Margin trajectory of Data Center REITs in the US

Source: Bloomberg, Emkay Research

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■ **Choosing the most appropriate type of investment**

For investors interested in gaining exposure to data centers, Exhibit 100 summarizes some of the key considerations for choosing an appropriate investment.

Traditionally, real estate investors have focused on data center investments with lower operational complexity. In contrast, infrastructure investors have provided a wider spectrum of data center services related to the essential operation of the facilities, including the connectivity requirements of their tenants.

Exhibit 100: Key considerations for choosing an appropriate form data center investment

Particulars	Direct Investment	Platform Investment	Development
Definition	Direct Investment in data-center assets with long leases	Acquire stake in the developer and/or operator platforms	Partner with developer/operator to develop and sell new data centers
Specialized development expertise	Limited	Medium-to-high	High
Operational exposure	Low-to-medium	Medium-to-high	Limited
Tenant concentration	High	Low-to-medium	High
Tenant credit quality	Investment grade	Mixed	Investment grade
Obsolescence risk	Higher proportion of older, less-efficient data centers	Depends on the amount of maintenance spend and the potential for upgrade	Ability to incorporate latest power and cooling technologies
Yield as share of total return	High	Medium	Low
Return profile	Income from stable-to-increasing rents	Diversified income streams from operations and development	Return certainty if built-to-suit/preleased

Source: CBRE, Industry, Emkay Research

DC market – USA vs RoW

We believe that the rosy demand is helped by high barriers to entry within certain segments of the data center market. Data centers are expensive to build, but new market entrants have solved this issue given the availability of capital over the past several years, especially from private equity.

As such, many new entrants have entered this space and are competing on cost – often by building data centers in non-core markets with minimal connectivity, but access to cheap power and cooling. Customers who primarily focus on cost savings and are willing to compromise on performance, connectivity and low latency may find these options attractive; margins on such offerings are fairly low, but can be attractive for investors, on a levered basis.

What new market entrants have not been able to overcome, however, is that most existing points of dense internet connection across the world are already owned by data center providers. These nodes of densification are the crown jewels in the data center ecosystem given the large amount of traffic that goes through these data centers, the large number of interconnections within the data center, the network density, and very often the low latency that these data centers have which is an absolute requirement for high-speed performance-dependent applications. Building such dense network and cloud ecosystems takes decades. Such assets tend to appreciate in value over time as they are scarce, given that DC REITs dominate the colo market.

Though India is a relatively niche albeit growing market in the data center industry, a number of mergers and acquisitions have happened globally. For the better part of the last decade, acquisitions have been a meaningful driver of growth for the US based Data Center REITs and cloud service providers. Large strategic deals were done in order to gain expertise in a product or to create presence in a major market.

International markets are not as mature as the US, and are hence growing much faster, off their smaller bases. A major driver has been US-based cloud providers who are building their presence internationally. To add on companies are also increasingly becoming global enterprises. We believe that the larger players could get more involved in entering secondary markets. Global DC operators have expanded into Indian markets, and going ahead are expected to add more capacity.

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Recent deals in the global market

Data centers have piqued the interest of investors, often because of the steady, utility-like cash flows and risk-adjusted yields. From 2015 to 2018, private equity buyers accounted for 42% of the deal value; share increased to 65% from 2019 to 2021 and to more than 90% during 2022.

In 2021, there were ~99 data center deals, with an aggregate value of more than USD30bn (+40% YoY). In 2022, there were 100+ deals, with an aggregate value of USD70billion. After a busy few years, 2024 and 2023 saw a limited volume of M&A activity, likely down due to the rising cost of capital. The demand for data center capacity is tied to societal demand and technological developments, which are independent of macroeconomic headwinds. The business plans and investment strategies of data center operators and hyperscalers data are inherently linked to this demand, and thus investment in data centers during the past few years has continued unabated.

Exhibit 101: Variety of deal types that contributed to heavy M&A activity in recent years
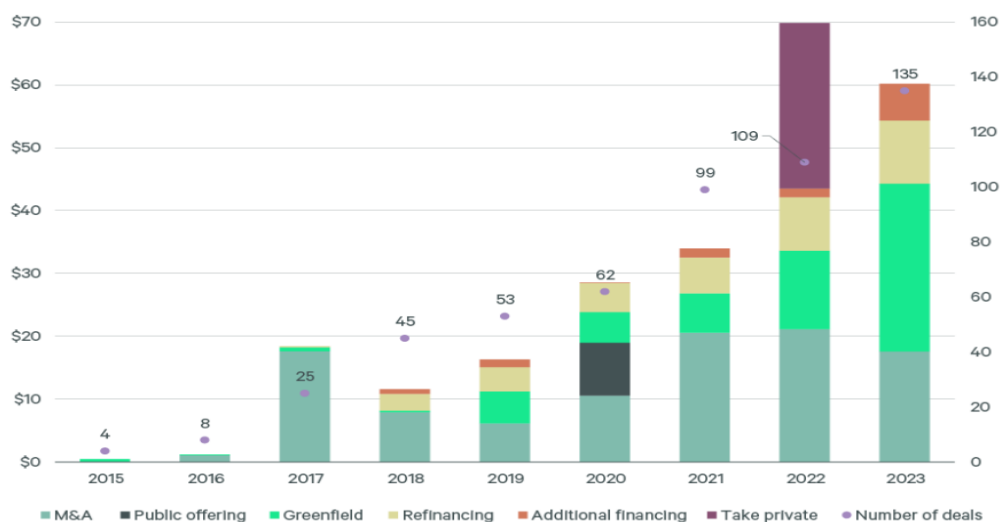
Source: Industry, Emkay Research; Note: RHS Y axis: USD bn

Exhibit 102: Gradual escalation in the EV/EBITDA of data center transactions over the years
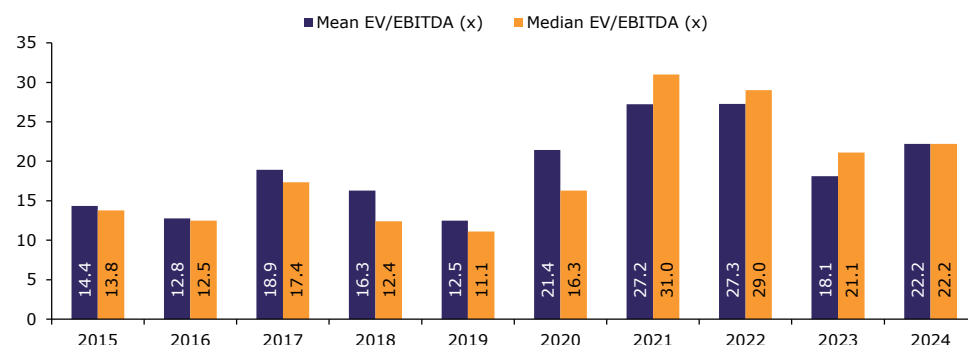

Source: Industry, Emkay Research

Other than growth prospects in upcoming economies like India, the continued push to virtualize products and services previously performed by customers via value added SaaS, IaaS and PaaS solutions is also contributing to a wave of acquisitions of smaller companies that can be tucked into the platforms. In the past few years, acquisitions across markets have been made in the areas of edge networks, interconnectivity, cloud connectivity, and bare metal services, to name a few. Exhibit 103 is a list of acquisitions along with their valuations that have taken place in this industry.

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Exhibit 103: Data center transaction in the past 5 years – EV/EBITDA multiple of ~24x

Announcement Date	Name of company acquired	Acquirer Name	Announced Total Value (USD mn)	EV/EBITDA (x)
Jul-24	Qi An Xin Technology Group Inc	China Electronics Corp	107.8	39.4
Jun-24	Cia de Saneamento Basico	Equatorial Energia SA	1234	5.0
Nov-23	Vnet Group Inc	Shandong Hi-Speed Holdings Gro	166	1.2
Nov-23	Integracao Transmissora de Energia S/A	Caisse de Depot et Placement du Quebec	142	21.1
Sep-23	Asian wholesale	KKR	4,000	32.0
Jun-23	Compass	Brookfield Infrastructure	5,700	30.0
Apr-23	Data4	Brookfield Infrastructure	3,800	28.0
Jul-22	American Tower	Stonepeak Infrastructure	2,500	30.0
Jun-22	Databank	Swisslife + EDF	4,444	28.0
May-22	Switch	IFM + Digitalbridge	11,024	34.4
Jan-22	Copt	Cloud Capital	223	16.9
Jan-22	CyrusOne Houston	Digital bridge	670	19.2
Jan-22	Teraco	Digital Realty Trust Inc	3,500	35.0
Dec-21	Cologix	Stonepeak Infrastructure	4,000	31.0
Nov-21	Coresite	American Tower	10,177	31.4
Nov-21	Cyrus One	KKR	14,782	25.5
Jul-21	Green Mountain	Azrieli Group	900	38.0
Jul-21	Digiplex	IPI	1,200	32.0
Jun-21	QTS	Blackstone	10,000	31.5
May-21	Data Foundry	Switch	420	22.0
May-21	Sila	Mapletree Investments	1,300	18.0
Feb-21	Cyxtera	Starboard	3,400	15.6
Oct-20	Princeton Digital Realty	OTPP	400	25.0
Sep-20	Zcolo	DataBank	1,400	16.3
Jun-20	13 Bell Canada data centers	Equinix Inc	750	15.0
Jan-20	Air Trunk (88% stake)	Macquarie Group	2,100	33.0
Oct-19	Interxion	Digital Realty Trust Inc	8,400	20.3
Sep-19	Tele2 Russia International Cellular BV	Rostelecom PJSC	2,043	6.0
Apr-19	DNA Oyj (54% stake)	Telenor ASA	1,691	11.1
	Mean EV/EBITDA			**23.9**
	Median EV/EBITDA			**25.5**

Source: Bloomberg, Emkay Research

Exhibit 104: Global Data Center REITs witness enhancement in valuation over past decade
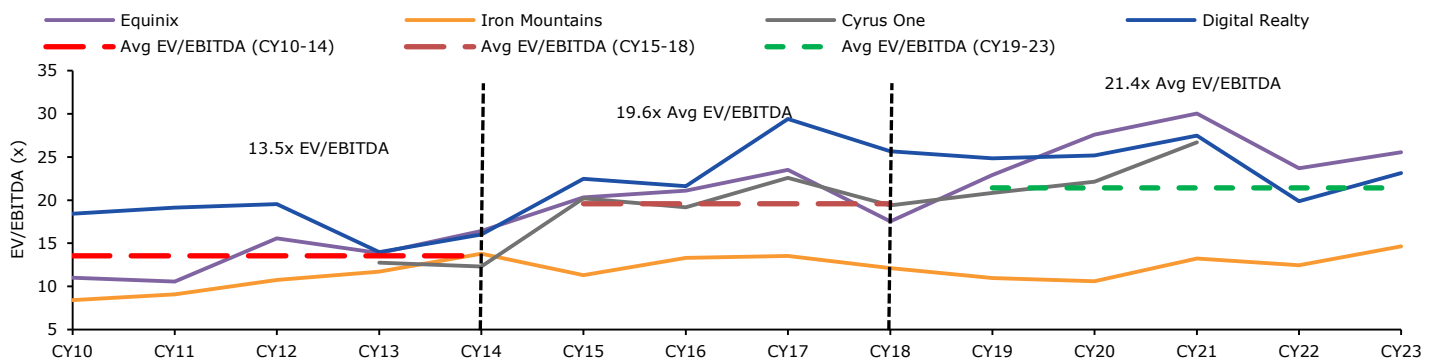
Source: Bloomberg, Emkay Research

Over a short period of three years, a host of developments have happened in the DC space wrt government policies, announcement of JV/JD platforms, entry of new players, etc. The Indian DC ecosystem is fast becoming conducive for receiving mega investments into the sector.

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Cloud Computing

NIST defines cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (eg networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction". Access to cloud computing helps eliminate the need for individuals and businesses to self-manage physical resources themselves, and only pay for what they use.

Cloud computing is the engine that powers disruptive innovations such as Artificial Intelligence (AI), which rely on extensive databases and computational resources. Factors such as scalability and flexibility, cost optimization, enhanced collaboration, and security are incentivizing widespread enterprise cloud adoption.

Increasing enterprise adoption and growing demand due to technological developments like AI are enabling Big Tech companies that made early entry into cloud service to expand their ecosystem of products and services in the cloud services market. While current demand and expected market growth have enabled the entry of new players, the market remains highly concentrated, with a few large cloud service providers who enjoy first-mover advantage and leverage certain common characteristics of digital markets such as economies of scale, network effects, and conglomerate effects.

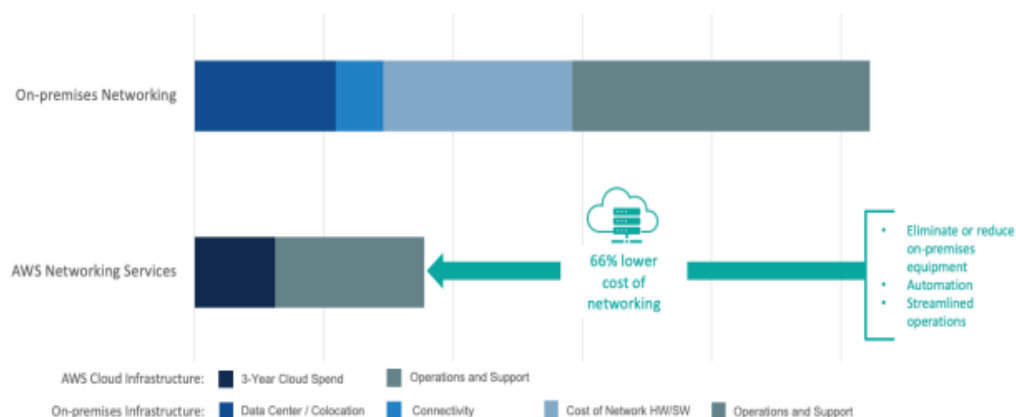### (i)   Why Transition from On-Premises to Cloud Computing

Organizations in the ongoing modern era concur that data is a valuable asset and is central to operations as well as a primary source of significant business insights. Almost every business will greatly benefit from the insights derived from a modern data infrastructure: improved operational effectiveness, more targeted business opportunities, improved product capabilities and qualities, faster development and innovation, etc. Trying to solve these issues on-premises is costly and complex; as indicated in Exhibit 108, alternatives to on-premises infrastructure can lead to 66% total savings in IT operations over a period of 3years.

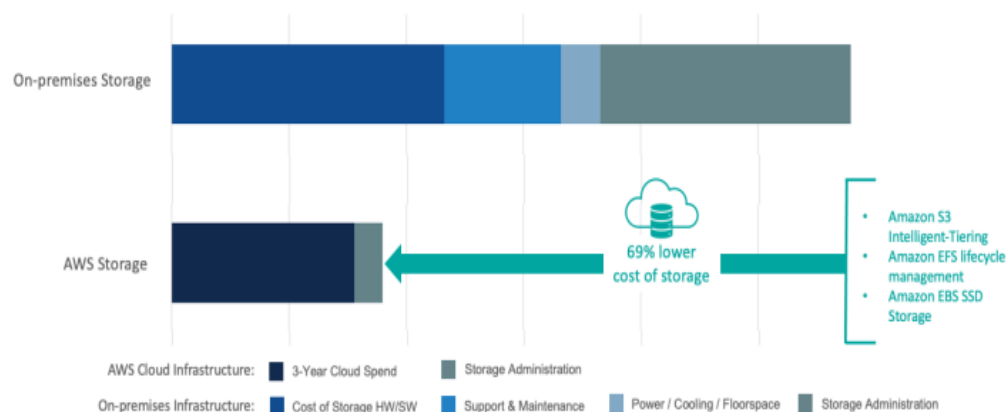**Exhibit 105: Three-year Expected Cost of Compute/Servers**
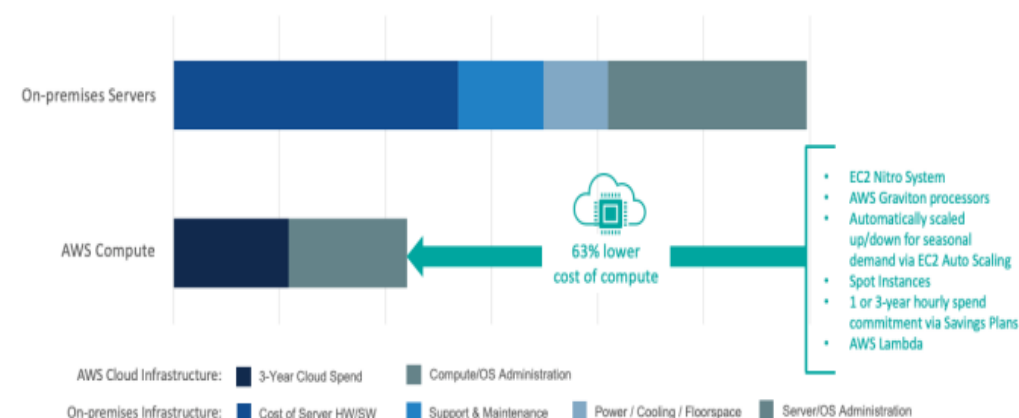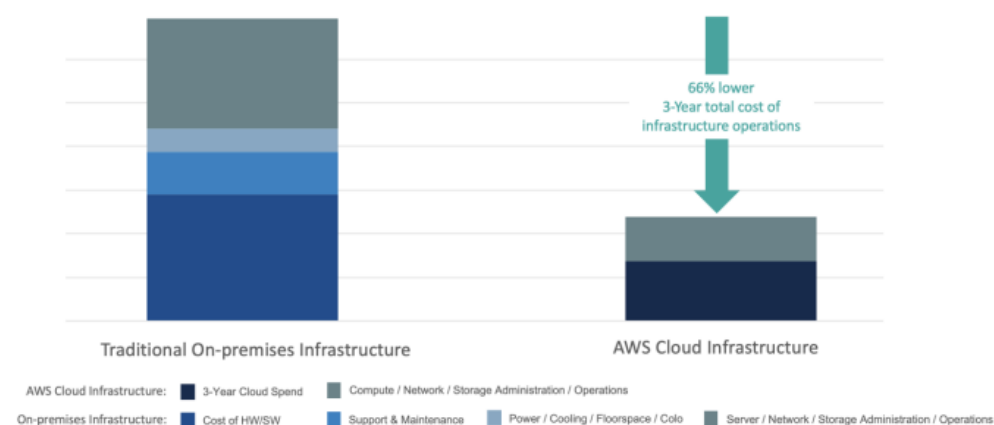

Source: AWS, Emkay Research

Exhibit 106: Three-year Expected Cost of Networking Services

Source: AWS, Emkay Research

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Exhibit 107: Three-year Expected Cost of Storage

Source: AWS, Emkay Research

Exhibit 108: Total three-year Expected Cost of Infrastructure Operations

Source: AWS, Emkay Research

(ii) Understanding the cloud computing stack and cloud deployment models

Exhibits 109 and 110 depict the three delivery models of cloud services that are layered over one another, and their differentiation factors. Most cloud computing firms operate in the SaaS layer due to lower upfront investments and larger potential user base.

Exhibit 109: Delivery Models of Cloud Services

Services	Technical Definition	Examples
Infrastructure as a Service (IaaS)	Provider offers on-demand access to storage (eg object storage, file storage, block storage), computing (eg physical servers, virtual machines), and networking services (eg routers, switches).	Google Compute Engine, Amazon Elastic Compute Cloud, Microsoft Azure, DigitalOcean, Linode, Rackspace, Cisco Metapod
	IaaS is fully a self-service offering for accessing and monitoring computers, networking, storage, and other services.	
	IaaS allows businesses to purchase resources on demand and as needed, instead of outright purchase of hardware.	
Platform as a Service (PaaS)	Delivery model of PaaS is similar to that of SaaS, except that instead of delivering software over the internet, PaaS provides a platform for software creation.	Google App Engine, Amazon Web Services, Elastic Beanstalk, Windows Azure, Apache Stratos, Red Hat OpenShift
	This platform is delivered via the web, giving developers the freedom to concentrate on building the software without having to worry about operating systems, software updates, storage, or infrastructure.	
	The user controls and manages only their own data and deployed applications. Herewith, developers provide cloud components to certain software while being used mainly for applications. PaaS delivers a framework that developers can build on and use to create customized applications.	
Software as a Service (SaaS)	Providers offer ready-to-use software applications that are hosted on the cloud and can be accessed through web browsers without the need for local download or installation.	Microsoft 365, Salesforce, Google Workspace, Dropbox, Cisco, WebEx, SAP Concur
	The underlying infrastructure, middleware, and application capabilities are managed by the provider, with the user having control over only specific application settings. Due to its web-delivery model, SaaS eliminates the need to have IT staff download or install applications on each individual computer.	
	With SaaS, vendors manage all potential technical issues, such as data, middleware, servers, and storage, resulting in streamlined maintenance and support for the business customer.	

Source: Industry, Emkay Research

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Exhibit 110: Responsibility of providers across delivery models
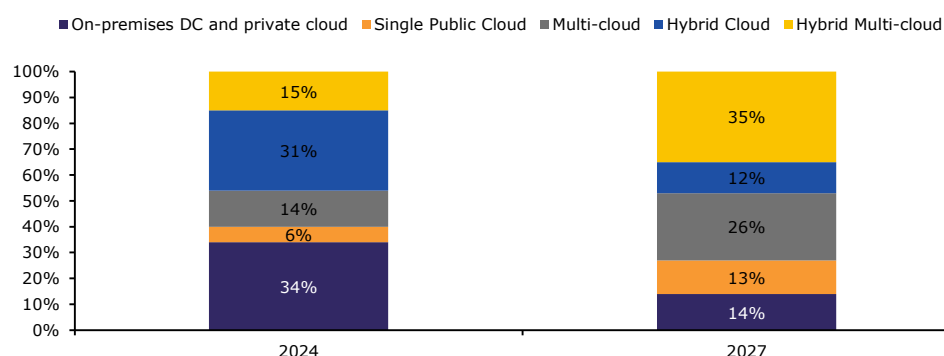

Source: Industry, Emkay Research

Cloud market is also differentiated by deployment models

- **Level of infrastructure access:** Categorized as public, private, and community.

- **Basis of infrastructure ownership:** Categorized as provider-owned, self-owned, and hybrid. These categories are not mutually exclusive.

Exhibit 111: Deployment Model in Cloud

Public Cloud	Private Cloud	Community Cloud	Hybrid Cloud	Multi Cloud
Open for use by the general public, with the infrastructure owned and managed by the cloud service provider (CSP) on own premises	Exclusive use by a single private organization, with the infrastructure owned and managed by the organization on premises, or contracted to an external party, or both	Shared access by a community of organizations, with the infrastructure owned and managed by community members on premises, or contracted to an external party, or both	A combination of public and private cloud deployments, with part of the underlying infrastructure hosted on premises	A deployment model that combines multiple public CSPs, with the control and operation of the infrastructure distributed among them

Source: Industry, Emkay Research

Exhibit 112: Current and Planned IT Deployment Models (2024-27)

Source: Industry, Emkay Research

Exhibit 113: Co-location vs Cloud

Particulars	Co-location	Cloud
Ownership and Management	Customer owns hardware and manages infrastructure	Provider owns hardware and manages infrastructure
Scalability	Limited by physical space and resources	Easily scalable on-demand, virtually unlimited
Upfront Costs	High upfront costs for hardware and setup	Low upfront costs, pay only for usage
Ongoing Costs	Lower ongoing costs, mainly for space and power	Higher ongoing costs; pay-as-you-go pricing based on resource consumption
Customization	Full hardware control, customization for unique or specialized needs	Virtualized customization, limited to provider's options and configurations
Security	Customer has full control over security measures	Shared security responsibility between customer and provider
Connectivity	Greater network control, customization, provider choice	Limited physical network control, virtual configuration, shared infrastructure
Providers	NTT, STT, Sify, Anant Raj, Techno Electric, Nxtra	AWS, Microsoft Azure, Google Cloud Platform

Source: Industry, Emkay Research

(iii) Economies of scale for cloud players

The dominance of hyperscalers is further reinforced by certain key characteristics of the cloud services market such as economies of scale, network effects, vertical integration, and conglomerate effects. Large providers are able to leverage their scale to achieve cost efficiency in operations and undertake strategic investments in innovations. Credits11 and acquisitions12 are important pathways through which hyperscalers are expanding their ecosystem in both, India and abroad.

Exhibit 114: Pathways of 'economies of scale for Cloud players

Data Centers	Credits	Innovation
Discounts: Large operators with higher purchasing power are able to obtain bigger discounts on the bulk purchase of hardware.	Cloud credits are funds provided to startups to cover their initial infrastructure costs and to enable experimentation with a range of advanced cloud services. Large providers that have a bigger existing customer base are able to provide both, higher credits and discounts, as well as spread their risk in credit investments across a broader range of startup users of their services.	**Internal R&D:** For improving existing services as well as developing new cloud services, large cloud providers are in a better position to incur significant fixed and sunk costs, as they are able to spread the high R&D costs across a large user base and a wide range of cloud and non-cloud product offerings.
Efficiency in Overhead Costs: Large providers are able to invest in bigger data centers which cuts down average operational and energy costs while enhancing security and reliability.		**Acquisitions:** Large cloud providers are better placed to spend significant sums in acquiring innovative small businesses with offerings that can be integrated into their platform, thus enabling providers to enhance their product differentiation. For instance, during 2018 20, large cloud providers invested over USD42.5bn in 35 acquisitions.
Efficiency from a broader user base: Large providers are able to reduce relative variance in demand by serving a variety of customers across industries and geographies, thereby ensuring efficient utilization of their data centers.		

Source: Industry, Emkay Research

Hyperscalers enjoy the advantage through other avenues

- **Vertical integration:** Vertically integrated offerings are attractive to end-users, who value technically seamless integration of services across the stack and the possibility of higher discounts on a larger spend across the stack.

- **Conglomerate Effects:** Hyperscalers who are part of large tech conglomerates that have significant presence in other digital markets, which offer economies of scope and other advantages. Economies of scope work through spreading human capital costs and fixed

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investments on R&D across a range of non-cloud digital services, and the cost savings associated with hosting such services on their own cloud.

■ **Virtualization:** CSPs differentiate themselves from the capabilities of individual servers and data centers through virtualization, ie adding an abstraction layer between hardware and applications. Virtualization enables multiple workloads and operating systems to run on the same physical server. This facilitates critical competitive advantages of the cloud, including scalability, maximizing resource utilization, and provisioning more workloads with lower operating expenses.

(iv) Global Market size of cloud computing

Market studies on the competitive landscape of the cloud computing market across geographies have largely focused on the public cloud, which contains the largest number and the broadest spectrum of users. The global public cloud market is estimated to have grown from USD351.4bn in 2020 to USD669.2bn in 2023 (24% CAGR).

The need for business continuity and hybrid workplaces was the primary driver of migration to the public cloud in 2020 and 2021. Several applications were deployed in the IaaS model during this period, largely motivated by the need to reduce large capital expenditures associated with managing on-premises storage and compute resources. In 2022 and 2023, there was increasing adoption of PaaS services to further cut down on the need for managing the underlying infrastructure as well as to take advantage of specific cloud native capabilities that are not available on IaaS.

Exhibit 115: Current vs Expected growth in the global public cloud market
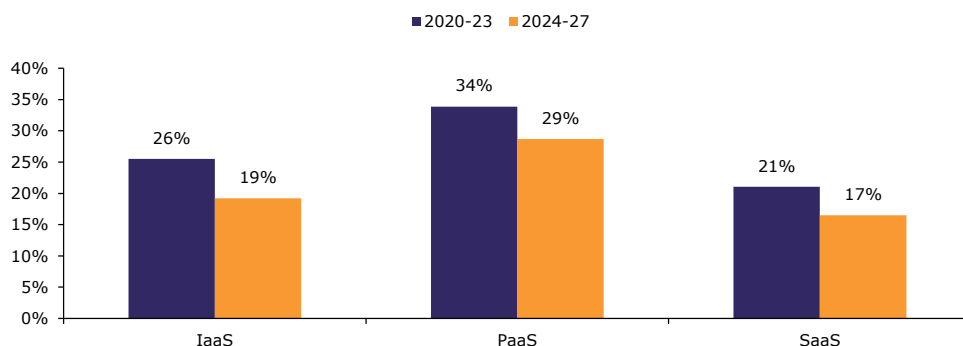
Source: Industry, Emkay Research

The global public cloud market is expected to grow to USD1.4trn by the end of 2027, as dominant software application categories such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) transition to the cloud to eliminate the complexities of in-house management and to leverage the capabilities of AI and Machine Learning (ML) for better user experience. However, the growth is expected to be slower in 2024-27 compared with the previous four-year period, partly due to the maturity of the market and partly owing to macroeconomic trends.

■ **IaaS model:** This has high financial and temporal entry barriers with limited scope for differentiation. AWS, with DCs across regions and offering over 200 services, is the leading player in this segment; IaaS revenue contributed ~75% of its public cloud services revenue in 2023. Microsoft and Google are making rapid inroads into this segment, followed by multiple Chinese cloud providers such as Alibaba Group, Huawei, Tencent, and China Telecom, who are close competitors.

■ **PaaS/SaaS markets:** These have relatively higher product differentiation. The growth of the PaaS market is driven mainly by data management software, middleware applications, and application development platforms, while the growth of the SaaS segment can be attributed to security and ERM applications. Microsoft is a leading player in both segments, with PaaS/SaaS contributing to ~26.2%/55% of their PCS revenue.

(v) Mega 3 of cloud industry

Amazon, Microsoft, and Google are the clear leaders in the worldwide cloud market. Their market share is 31%, 24% and 12%, respectively, while no other company could claim more

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than 4%. Following the three leaders, the top six ranking is completed by Alibaba, Oracle and Salesforce. Ex China, the top-three cloud provider ranking is the same in all major regions – the US, rest of the APAC region, Europe, and the rest of the world (RoW). Beyond the top-three, the ranking in the regions does change a little, with Oracle, Salesforce, IBM, and NTT typically jostling for a better position. However, the commonality of the top three rankings demonstrates the truly global nature of the cloud market.

Exhibit 116: Cloud services leadership, by region

Rank	Worldwide	USA	China	Rest of APAC	Europe	RoW
I	Amazon	Amazon	Alibaba	Amazon	Amazon	Amazon
II	Microsoft	Microsoft	Tencent	Microsoft	Microsoft	Microsoft
III	Google	Google	China Telecom	Google	Google	Google
IV	Alibaba	Oracle	Huawei	NTT	Oracle	Sales force
V	Oracle	Sales force	China Unicorn	Alibaba	Sales force	Oracle
VI	Sales force	IBM	China Mobile	Fujitsu	IBM	IBM

Source: Industry, Emkay Research

Exhibit 117: Top-10 global players collectively command ~80% of the public cloud market

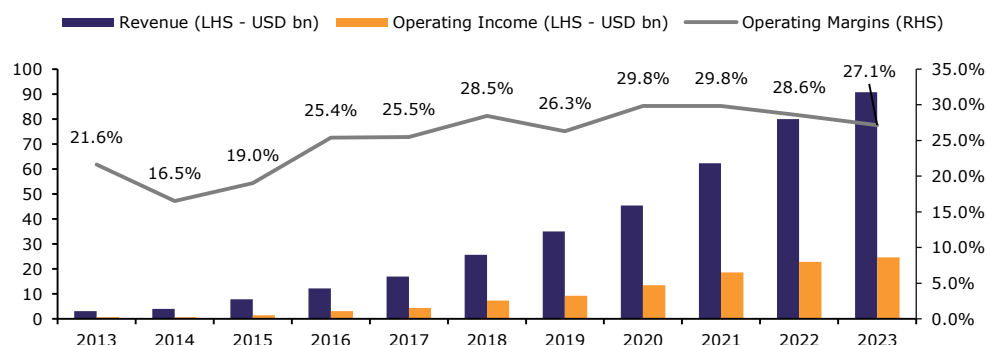| Ranking	Cloud Service Provider	Regions	Availability Zones	Market Share
I	Amazon Web Services (AWS)	33	105	31%
II	Microsoft Azure	64	126	24%
III	Google Cloud Platform (GCP)	40	121	12%
IV	Alibaba Cloud	30	89	4%
V	Oracle Cloud	48	58	3%
VI	IBM Cloud	10	30	3%
VII	Tencent Cloud	21	65	2%
VIII	OVHcloud	17	37	<1%
IX	DigitalOcean	9	15	<1%
X	Linode (Akamai)	20	20	<1%

Source: Industry, Emkay Research

Amazon Web Services (AWS) business model

Amazon's underlying tech infrastructure in the early 2000s led to the creation of AWS; it became a key element to enable Amazon to transition to a platform business model (enable other stores to be hosted. Apart from Amazon). In 2000, keeping in mind to allow other stores to build their e-commerce units apart from Amazon, the AWS team came up with an e-commerce service at the time, called 'Merchant.com', and soon realized that it was impossible to create this on Amazon's existing infrastructure. Hence came into being Amazon AWS. From that attempt to scale up the Merchant.com infrastructure, the company has managed to build an infrastructure that powers up an ecosystem of small and medium businesses.

Today, Amazon AWS—although a separate unit within Amazon—is a crucial contributor to the company's overall profitability. AWS, a cloud infrastructure, is a service that provides servers, storage, networking, remote computing, email, mobile development, and security. Today, AWS is a business segment that generates over USD90bn in revenue .

Exhibit 118: Revenue and operating income from AWS operations

Source: Company, Emkay Research

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AWS follows a platform business model that gains traction by tapping into network effects. Born as an infrastructure built on top of Amazon's infrastructure, AWS has become a company offering cloud services to thousands of clients, from the enterprise level to startups. Its marketplace enables companies to connect to other service providers for building integrated solutions for organizations. They are applying expertise in building up ecosystems on top of Amazon's business model to build an entrepreneurial ecosystem that powers up the IT of countless numbers of companies.

Exhibit 119: Amazon Web Services Business Model Snapshot
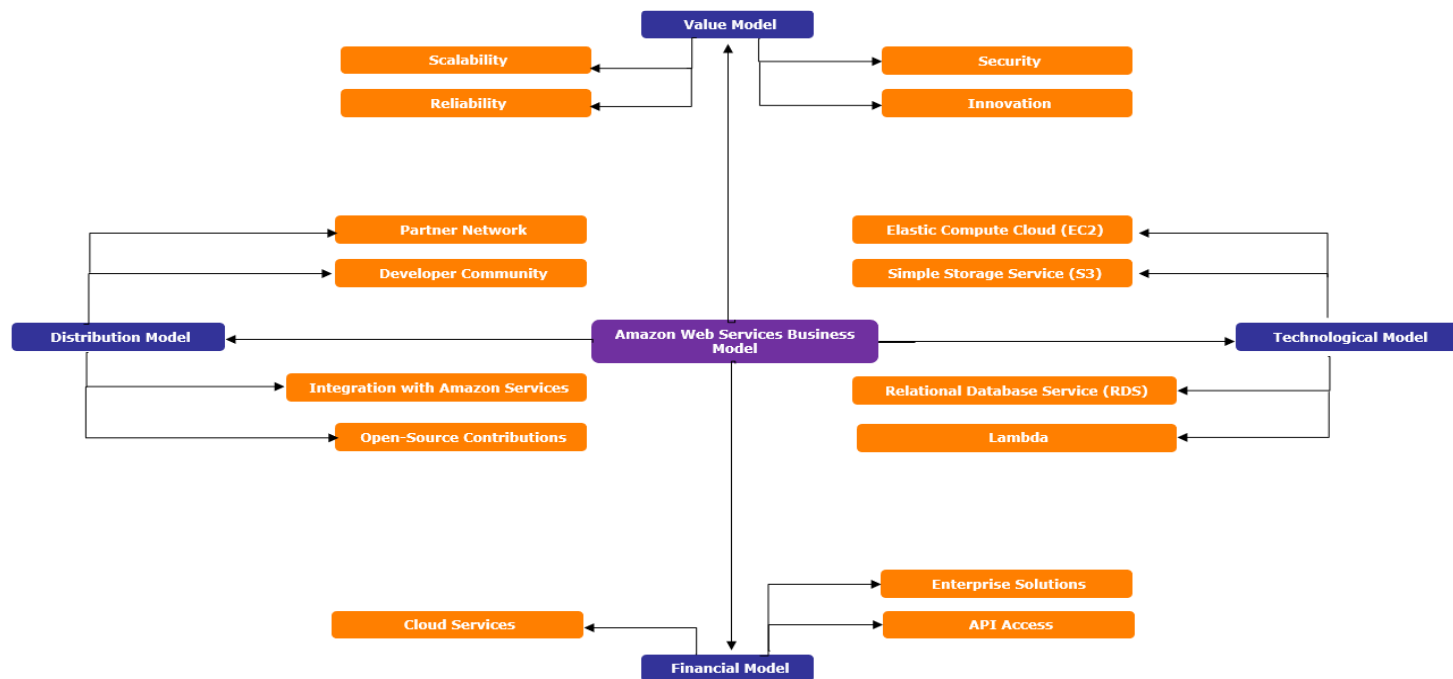
Source: Industry, Emkay Research

A platform follows a set of logic which is relatively new compared with that of traditional organizations. While traditional companies of the past built value over and above a value chain made of virtualizing their supply chain, to gain as much control as possible on the means of production, a platform aims at creating network effects. Thus, the more it enables its key stakeholders (drivers – riders in Uber's case, buyers and sellers in Amazon's case, hosts and guests in Airbnb's case) to connect and transact in a frictionless manner, the more those repeated interactions and transactions drive up network effects.

To make sure a network effect implies that a becomes more and more valuable, the more users join in. Thus, an additional user does not become more expensive for the business, instead, it makes the service more valuable for others joining in later, and it lowers transaction costs associated with the platform. Therefore, it becomes cheaper and better. AWS in particular powers up thousands of businesses, from small to enterprise, in both—the private and public sectors.

As Amazon AWS becomes the infrastructure for thousands of startups and SaaS companies, it shares its distribution capability by integrating other services providers to enable other companies to benefit from solutions that go well beyond the cloud. Thus, the AWS marketplace becomes a provider of other companies' services and products in addition to its cloud infrastructure. That enables it to scale further by creating a market that did not exist before, while scaling it up altogether.

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Exhibit 120: The AWS marketplace and its respective elements

Element	Offerings	Description
Value Proposition	Scalable Cloud Services	Provide access to scalable and flexible cloud computing services
	Reliability and Availability	High levels of reliability and availability for applications
	Security and Compliance	Robust security and compliance measures
	Cost-Efficiency	Pay-as-you-go pricing, cost optimization tools, and economies of scale
	Global Reach	A global network of data centers and regions
Core Products/Services	Compute Services	Virtual servers, containers, and serverless computing
	Storage Services	Data storage solutions, databases, and data lakes
	Networking Services	Networking and content delivery services
	Security and Identity	Security, identity, and compliance services
	Analytics and Machine Learning	Data analytics and machine learning tools
	Application Integration	Integration and messaging services
	Developer Tools	Tools for development, deployment, and management
	Management and Governance	Services for managing and governing AWS resources.
Customer Segments	Enterprises	Large organizations seeking cloud solutions
	Startups	Early-stage companies looking for scalable infrastructure
	Developers	Individual developers and development teams
	Government and Education	Public sector entities and educational institutions
	Nonprofits	Nonprofit organizations with specific needs
	IoT and Edge	Internet of Things and edge computing applications
	Content Delivery	Content delivery and media companies
	Healthcare and Life Sciences	Healthcare and life sciences organizations
Revenue Streams	Usage-Based Pricing	Charges based on actual usage of AWS
	Subscription Plans	Revenue from various subscription plans
	Support and Maintenance	Fees for premium support and maintenance services
	Consulting and Professional Services	Earnings from consulting and professional services
	Training and Certification	Fees for training and certification programs
	Marketplace	Revenue from the AWS Marketplace for third-party solutions
	Data Transfer and Content Delivery	Charges for data transfer and content delivery services
	IoT and Edge Solutions	Income from IoT and edge computing services

Source: Company, Emkay Research

(vi) Cloud Service provider's capex

The DC industry is primarily evolving toward larger hyperscale structures, capable of delivering the energy and cooling support needed for those tasks. According to experts, there are more than 1,000 hyperscale DCs in the world, with another 440 in the pipeline at various stages of development, paving the way for a doubling of global capacity in the next four years. In aggregate, 60% of that capacity is controlled by Amazon, Microsoft, and Google, who have all announced extremely ambitious capex plans in recent months to meet their customer demands. Players like Meta, Apple, Alibaba, and Tencent are sharing the rest of the market.

Exhibit 121: Number of Hyperscale data centers in the world, 2015-2024
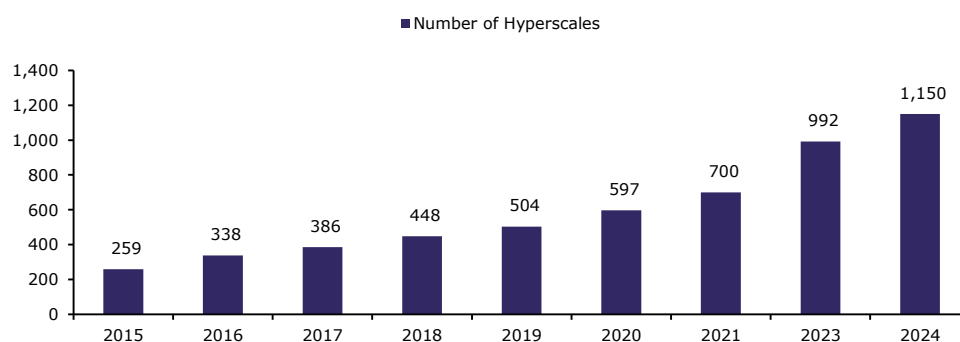
■ Number of Hyperscales

Year	Number of Hyperscales
2015	259
2016	338
2017	386
2018	448
2019	504
2020	597
2021	700
2023	992
2024	1,150

Source: Industry, Emkay Research

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Exhibit 122: Capex of top CSPs and hyperscale companies

Hyperscaler	Annualized Capex (USD bn)	Future Capex (USD bn)
Amazon Web Services (AWS)	28.6	30
Microsoft	56	60
Google (Alphabet)	48	50
Meta (Facebook)	26.9	38
Oracle Corp	6.7	7.5
Total Capex by Large players	**166.2**	**185**

Source: Industry, Emkay Research; Note: Annualized Capex = Extrapolated based on latest quarter; Future Capex = Projected over the next year
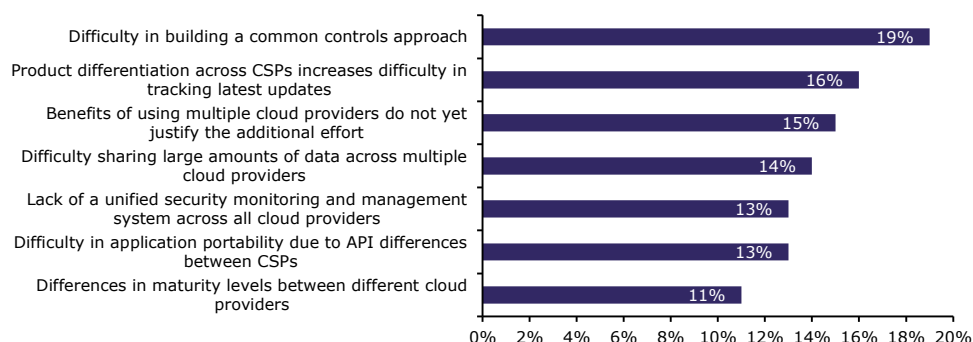
(vii) Concerns in the Cloud Services market

The importance of the cloud computing industry in the global economy and its fundamental characteristics have given rise to competition concerns. Anti-trust regulators have undertaken market studies on the cloud service market to understand potential concerns and evaluate the need for action.

Government inquiries into the industry highlighted competition concern (Exhibit 123); inquiries did not prescribe specific remedies for these issues.

Exhibit 123: Competition concerns in the cloud services market

| Concerns	Description
Egress Fees	Defined as charges for moving data out of the cloud. Fee depends on factors such as the volume of data transferred, originating region, distance between source and destination, customer tier, and subscription type. A common concern has been the substantial egress fees charged by hyperscalers which could disincentivize switching to another provider or adopting a multi-cloud strategy. Significant differences across providers' egress fees are estimated to be 5-10 times that of relatively smaller providers. Their fees are also higher than the incremental costs of providing egress. Reduction or elimination of egress fees is estimated to result in savings in the range of 7.5-27% of the customer's monthly bill.
Committed Spend Discounts	These are discounts offered by cloud providers in exchange for a customer committing to spend a predetermined amount across a range of cloud services over a specific period. Upon failing to meet the commitment by the end of the contract, the difference must be paid by the customer in lump sum.
Licensing Restrictions	This locks in customers to specific vendor ecosystems during migration to the cloud, limiting their flexibility and options. Cloud providers can leverage their dominant position in software to incorporate contractual clauses that make the deployment of their software relatively expensive in a competing cloud provider's environment. Others may have terms of use that outright restrict deployment in a different provider's cloud or apply a waiting period for the reuse of their licenses in a different cloud, thereby increasing the switching costs.
Tying and Bundling	Software providers tie or bundle the usage of their dominant software systems with their cloud infrastructure, making offerings by other cloud providers less attractive. A study done in 2023 revealed a significant decline in market share held by independent providers, from ~50% in 2015 to 23% in 2021. The European Commission is currently investigating Microsoft for potentially violating EU competition rules by bundling its Teams application to its Office 365 and Microsoft 365 suites. By offering Teams at close to no additional cost, Microsoft may be able to exclude competing collaboration suite providers.
Technical Barriers	Technical barriers may hinder the interoperability of cloud services, impacting user ability to use services from multiple providers. A study found the use of operating proprietary language to reduce the ease of interaction between different systems to be a major limitation on interoperability between cloud providers. While interoperability is a key requirement for multi-clouding, the ease or difficulty of data and application portability is the key consideration for switching.

Source: Industry, Emkay Research

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Exhibit 124: Technical challenges to multi-cloud adoption for enterprises

Difficulty in building a common controls approach — 19%
Product differentiation across CSPs increases difficulty in tracking latest updates — 16%
Benefits of using multiple cloud providers do not yet justify the additional effort — 15%
Difficulty sharing large amounts of data across multiple cloud providers — 14%
Lack of a unified security monitoring and management system across all cloud providers — 13%
Difficulty in application portability due to API differences between CSPs — 13%
Differences in maturity levels between different cloud providers — 11%

Source: Industry, Emkay Research

India Public Cloud Service (PCS) market

(i)   India – Current and Projected market

India's PCS market accounted for ~1.1% of global PCS market during 2020-23, which is estimated to have grown to USD8.3bn (2020-23: 29% CAGR). The need for business continuity and rapid digitization during Covid (2021 onward) led to rapid growth of the Indian PCS market. With the increasing adoption of AI by businesses for various purposes such as streamlining operations, enhancing productivity, improving customer experience, and launching new services, the market is expected to grow to USD20.3bn by end-2027 (2024-27: 24% CAGR).

In line with global trends, SaaS accounted for the highest share of revenue (~66% during 2020-23), driven by collaborative, CRM, and ERM applications. Going ahead, PaaS is expected to experience the highest growth on the back of growing demand for database management, application development, and analytics services. IaaS segment initially registered strong demand from enterprises shifting bulk of their applications to cloud in order to optimize capex, including proliferation of cloud-native startups (startups whose operations reside on cloud). Albeit, growth has tapered due to selective deployment of applications on the cloud and shift to serverless technologies offered as PaaS.
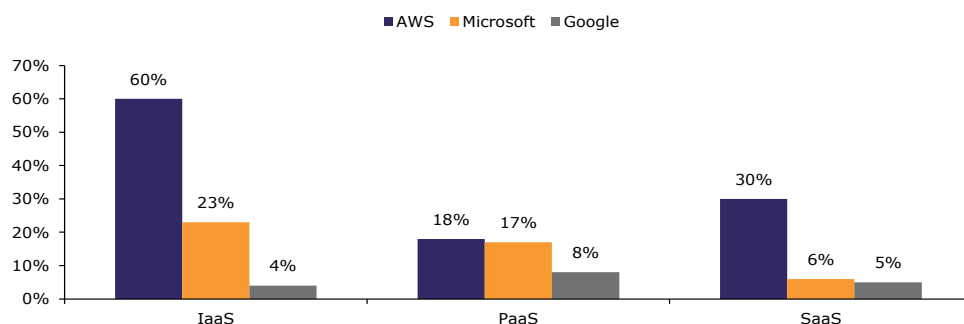
Exhibit 125: Current and expected CAGR of the Indian PCS market

Legend: ■ 2020-23 ■ 2024-27

	2020-23	2024-27
IaaS	20%	14%
PaaS	48%	43%
SaaS	30%	21%
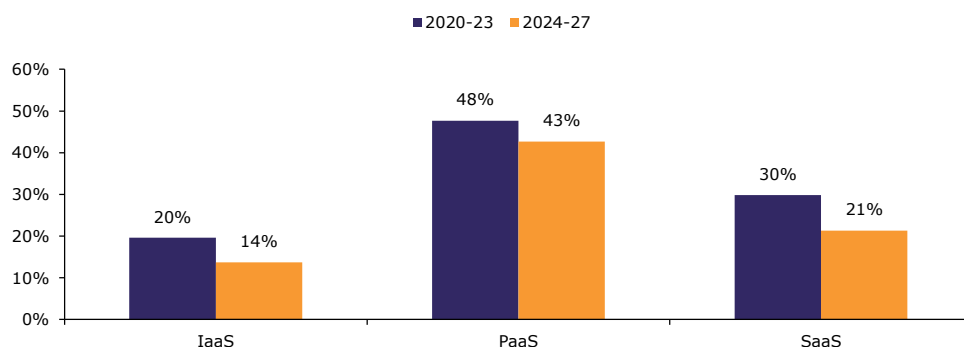
Source: Industry, Emkay Research

(ii)   Competitive landscape of the Indian PCS market

Similar to the global landscape, the Indian PCS market is dominated by a few international vendors. Cumulative market share (by revenue) of the top-ten vendors accounts for ~60% of the overall market, with the two leading vendors (ie Microsoft and AWS: 27% and 15%) capturing a little over 40%, while others account for less than 5% each.

Highest concentration of revenue is in the IaaS segment, with the top-three providers accounting for ~87% market share, while the PaaS/SaaS markets are relatively less concentrated, with the top-three vendors accounting for ~43%/41% market share, respectively.

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Exhibit 126: India cloud market share of top 3 vendors by segment

Source: Industry, Emkay Research

(iii) Major players in the Indian IaaS market

Exhibit 127: Microsoft dominates the IaaS segment; meanwhile, GCP has doubled its market share to 4%; AWS to enhance capex going ahead
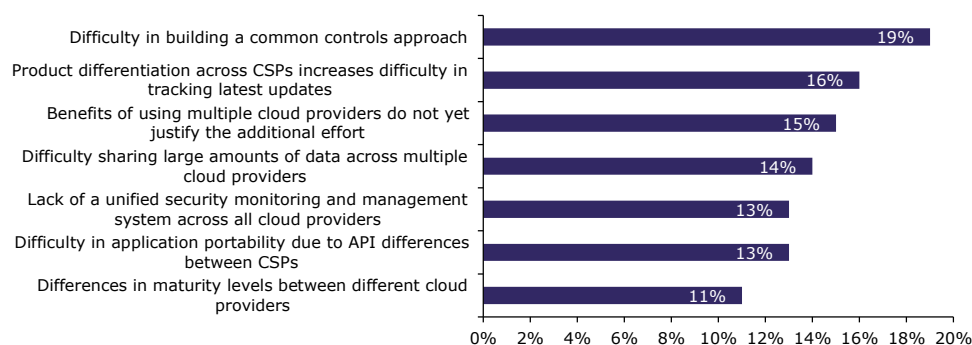
Segment	Microsoft	AWS	Google
IaaS	Microsoft, a top competitor in this segment, witnessed 20% annual revenue growth, contributing ~18% of its total revenue in 2023. Microsoft is the leader in the Indian PCS market, with significant presence across all three layers, particularly PaaS and SaaS, registering an overall revenue of USD2.2bn in 2023 In 2015, it was the first public cloud provider to open a local data center.	AWS's dominance is supported by consulting and migration services, a robust security framework, and a large partner network enabling it to become the second leading player. The company registered total revenue of USD1.3bn, with IaaS contributing ~85% of this. Its top products in this segment are its computing service, Amazon Elastic Cloud Compute (Amazon EC2), and its object storage service, Amazon Simple Storage (Amazon S3). The company has invested ~USD3.7bn during 2016-22, and is expected to invest another USD12.7bn in cloud infrastructure in India by 2030. It launched its first data-center infrastructure region in Mumbai in 2016, followed by one in Hyderabad in 2022. AWS also established local zones in Delhi and Kolkata, to support greater availability and lower latency for end-users.	GCP is the third largest player in the Indian IaaS segment, although its market share is relatively lower at 4%. IaaS contributed ~31% of Google's overall PCS revenue in 2023. The top product category in this segment is storage services, followed by computing. Its first cloud region went live in Mumbai in 2017, followed by Delhi-NCR in 2021. In collaboration with a wide network of channel partners, Google has rapidly acquired customers across diverse segments and attracted startups through its Google for Startups Cloud Program. Although a relatively late entrant, GCP doubled its market share in the past five years, and its AI push has contributed to attracting customers for its cloud services.

Source: Industry, Emkay Research

(iv) Growth drivers of cloud computing business in India

Multi-cloud adoption has been gaining traction in India. As per an IDC survey of 160 enterprises, 42% reported deployment of multi-cloud strategy. An estimated 80% of public cloud users have distributed their workload over multiple cloud providers, with 33% using two cloud providers (organizations with 50-249 employees), 19% using three cloud providers (organizations with 500-999 employees), and 27% using four or more cloud providers (organizations with >5,000 employees).

This deployment strategy is largely driven by product differentiation, ie the need for organizations to leverage the unique features of different providers and their suitability for different use cases, followed by other key considerations such as the desire to mitigate vendor lock-in and gain greater bargaining power in price negotiations.

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Exhibit 128: Drivers of multi-cloud adoption in India

Driver	%
Difficulty in building a common controls approach	19%
Product differentiation across CSPs increases difficulty in tracking latest updates	16%
Benefits of using multiple cloud providers do not yet justify the additional effort	15%
Difficulty sharing large amounts of data across multiple cloud providers	14%
Lack of a unified security monitoring and management system across all cloud providers	13%
Difficulty in application portability due to API differences between CSPs	13%
Differences in maturity levels between different cloud providers	11%

Source: Industry, Emkay Research

AI-ML, the future

The democratization of High Performance Computing (HPC) and AI, in particular, is expected to constitute a formidable tailwind for the sector and is likely to have a highly transformative impact on the entire ecosystem. These applications introduce much higher power densities per rack than those traditionally allocated to standard enterprise activities. Where basic computing typically operates on densities of around 4-5kW per rack, training centers dedicated to generative AI rely on racks that can exceed 100kW, assembled into massive clusters of GPU chips and linked by ultra-fast interconnect technologies.

GPT-4, for instance, is rumored to have been trained on 25,000 A100 Nvidia GPUs over 3 months and it is likely that future versions of the model will require even more resources. Open AI's ChatGPT currently receives 10mn queries per day and must already regulate traffic aggressively to avoid server saturation. Meanwhile, Google deals with 8.5bn daily searches, which showcases where total demand for LLM services could be in a few years. In these scenarios, the pace at which new data is generated will require implementation of increasingly advanced mass storage solutions.
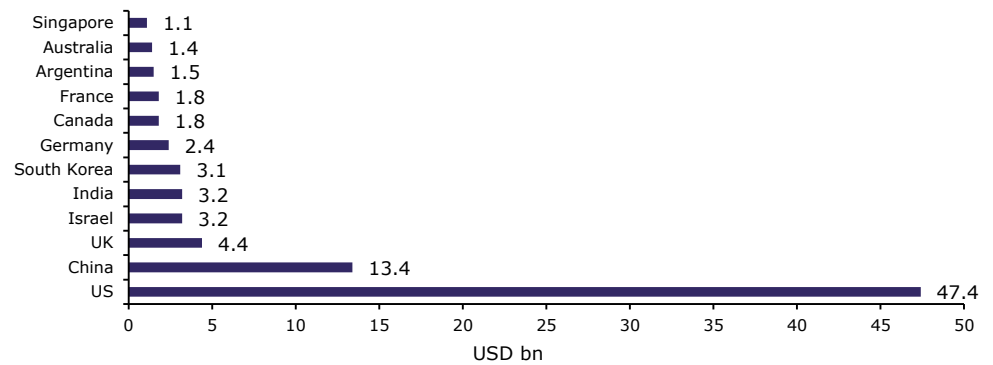
Mass adoption of cloud computing and artificial intelligence is driving exponential growth for the data center space in the country. Top Hyperscalers in the space are also ramping up their expansions across top locations in the country as they look to capitalize on the increasing demand from cloud usage. 2023 saw some landmark pre-commitments from top hyperscalers in major markets. In the beginning of 2023, Tech giant Google signed a 28-year land lease agreement for its new data center in Navi Mumbai aimed at expanding its cloud infrastructure in India. We are likely to witness more investments from hyperscalers in the next 3-4 years, who are looking at large scale expansions in India, focusing on long term growth.

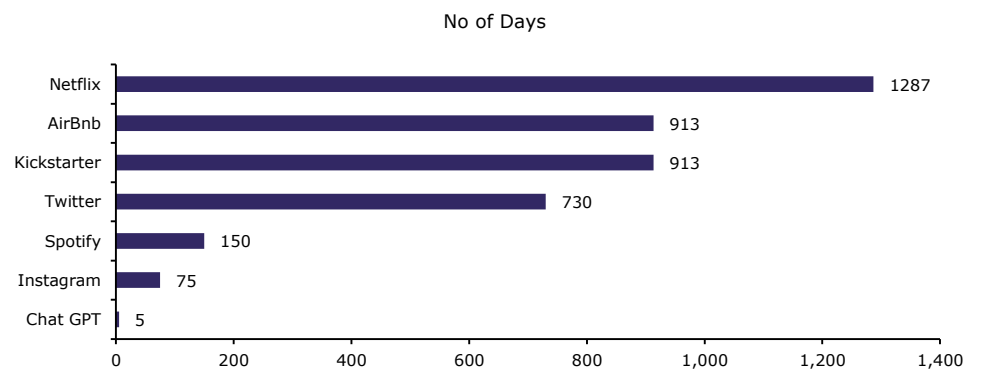**Exhibit 129: Global AI market size forecast by technology (2023-2027)**
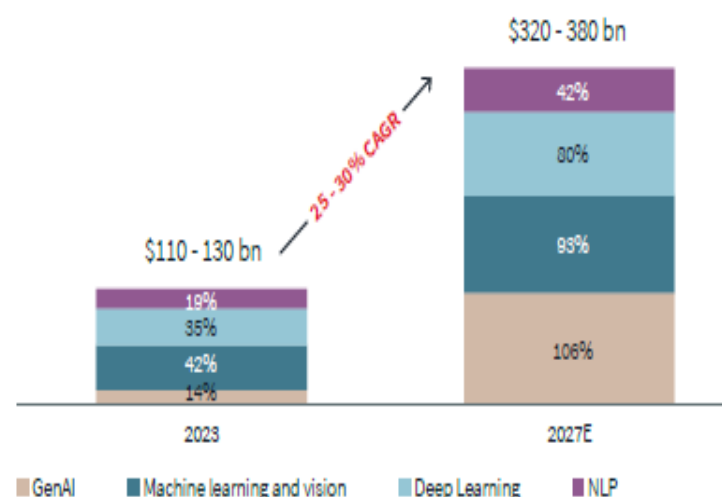
Source: JLL, BCG, Industry, Emkay Research

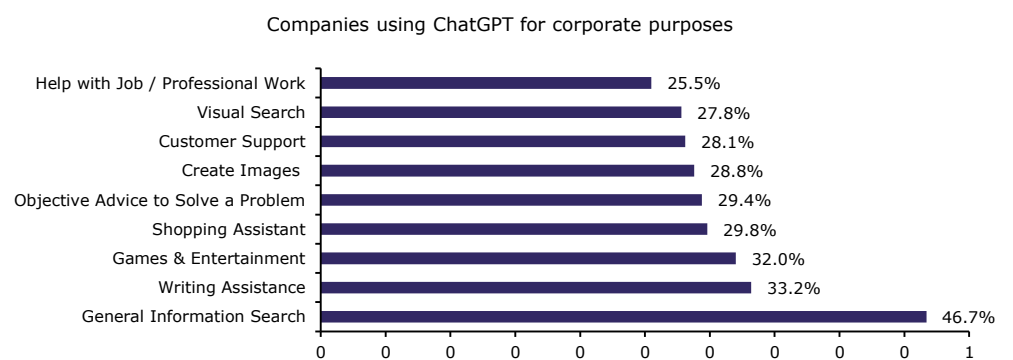**Exhibit 130: Global AI market size forecast, by industry (2023-2027)**

% of overall AI market	2023		2027E
Financial	30%	▼	27%
Media	15%	▼	14%
Government	13%	▲	14%
Manufacturing	13%	▼	12%
Healthcare	5%	▲	9%
Tech	9%	▼	8%
Others	15%	▲	17%

Source: JLL, Industry, Emkay Research

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Exhibit 131: Private Investments into AI in 2022; India stands 5th globally, by investments

Country	USD bn
Singapore	1.1
Australia	1.4
Argentina	1.5
France	1.8
Canada	1.8
Germany	2.4
South Korea	3.1
India	3.2
Israel	3.2
UK	4.4
China	13.4
US	47.4

Source: Industry, Emkay Research

Exhibit 132: Time taken by platforms to reach 1mn users; Chat GPT is the fastest method, taking merely 5 days

No of Days

Platform	No of Days
Netflix	1287
AirBnb	913
Kickstarter	913
Twitter	730
Spotify	150
Instagram	75
Chat GPT	5

Source: Industry, Emkay Research

Exhibit 133: Chat GPT has witnessed demand across sectors

Companies using ChatGPT for corporate purposes

Purpose	%
Help with Job / Professional Work	25.5%
Visual Search	27.8%
Customer Support	28.1%
Create Images	28.8%
Objective Advice to Solve a Problem	29.4%
Shopping Assistant	29.8%
Games & Entertainment	32.0%
Writing Assistance	33.2%
General Information Search	46.7%

Source: Industry, Emkay Research

India AI market

India's AI market is clocking CAGR of 25-35%, and is projected to reach around USD17bn by 2027, according to experts. AI and ML have emerged as the top categories of IT spends by IT buyers in 2023. The growth was fueled by multiple factors, including increasing enterprise tech spending, India's growing AI talent base, and a significant increase in AI investments. Globally, investments in AI have seen 24% CAGR since 2019, with 2023 seeing investments close to USD83bn. The investments were largely made in horizontal AI applications in data analytics, GenAI, and ML algorithms and platforms.

Notably, around 93% of the investments made by Indian tech services and Made-in-India product players focus on digital content, data analytics, and supply chain. With increasing enterprise tech spending, technology service providers are developing an array of AI-based services and solutions, expanding their offerings beyond traditional IT services. This includes the development of proprietary AI and GenAI platforms, tools for automation, data analytics solutions, and bespoke AI applications for specific industry verticals such as healthcare, banking and finance, and retail. India ranks among the top-five nations with 14x growth in individuals skilled in AI in the last 7 years.

Exhibit 134: Industry-wise AI India market size forecast
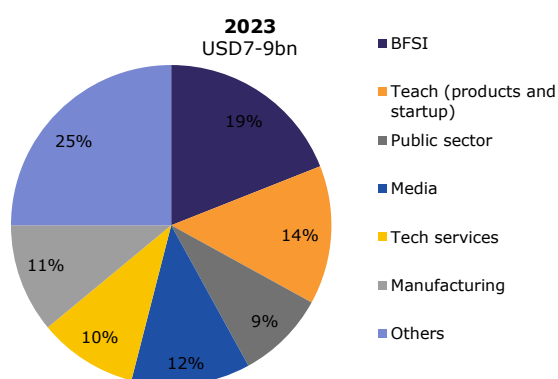
Source: Industry, Emkay Research

Exhibit 135: Expected to log 25% CAGR (2023-2027)
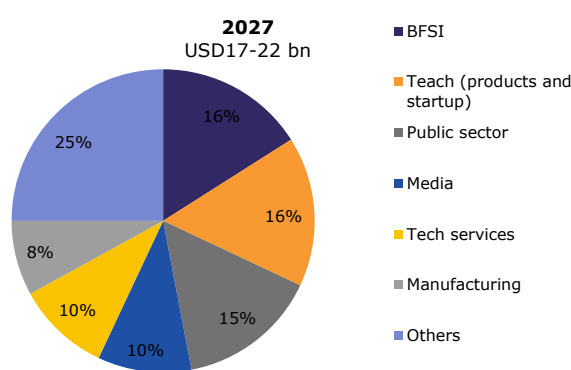
Source: Industry, Emkay Research

In terms of timelines, we believe India is on its way to becoming a leader in DC/Cloud services, and hence we believe migration of enterprises to hybrid cloud solutions will benefit players in the co-location/retail market, with the opportunity to drive up monthly recurring revenue (MRR) per cabinet via interconnection revenues, ancillary services, and other upcharge opportunities.

To add on, we expect demand from hyperscale cloud computing to remain solid which should drive strong wholesale leasing volume. Likely surge in transitioning toward 5G, growing technologies like Artificial Intelligence (AI), Internet of Things (IoT), and blockchain technology, should also be substantial contributors to demand over the next few years.

Cloud Service Provider (CSP) rentals

Cloud service rentals tend to be dynamic in nature, even more so than co-location, leading to lack of uniformity in comparison with peers. The subjectivity regarding services offered to customers by various CSPs, and in-turn the customer's diverse requirements, add to the lack of uniformity. Exhibit 136 highlights a standard query sheet to be filled prior to a CSP releasing quotation, basis customer requirement.

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Exhibit 136: Customer requirements for cloud services

Queries	Requirements
Total concurrent users at any point of time in order to size the firewall throughput	Number of cloud users at one instance
Total Number of locations expected to be connected to the site	Number of locations needed to be connected to
How will users access this setup	(MPLS/VPN/Internet)
If internet in above query, specify the required Bandwidth	(Mbps/GB)
Who will provide the Database Licenses?	Customer/CSP
Is database management service required?	Yes/No
Required Backup Space at DC site	GB/TB
Confirm the Backup Policy	Incremental/Daily/Weekly/All
Retention Period of data	Number of years/months
Load balancer services required for distribution of loads between the application	Specify the required number of load balancers, in case required
Additional security components required, apart from firewall	WAF/SIEM/HIPS
Is SSL Certificate required?	SSL Certificate: Alpha/Domain/Organization/Wildcard/extended SSL
Is disaster recovery (DR) service required?	100%/50% of DC, if required
Number of DR Drills required	For instance: 2 Drills annually
Confirm peak hours and daily log/Flat files size that needs to be replicated	GB/TB
Confirm expected RPO	For instance: 30 minutes, if required
Confirm expected RTO	For instance: 2 hours, if required
Confirm how many public IP clients will be required at DR site	Fill number if required
Share the VM/Server details such as vCPU, vRam, and Disk, along with quantity.	For instance: 8vCPU/8GB RAM/250GB storage required per server
Confirm OS Version and Edition	Windows 2016 std/CentOS Community
Confirm Database Software Version and edition	MS SQL Server 2016 Std Edition/My SQL 5.7 Community Edition

Source: Industry, Emkay Research

Charges paid by customers not only vary basis their requirement, but are also dependent on who the CSP (cloud service provider) is (Exhibits 137-140).

(i) Cloud storage pricing comparison

Exhibit 137 gives a comparison of storage pricing across CSPs. Prices for storage services are marginally different for CSPs, indicating competitive intensity among market leaders. Azure stands out as the most cost-effective alternative among peers.

Exhibit 137: Cloud storage pricing comparison

Cloud Provider	Storage (USD/GB/month)	Price comparison vs base
Azure	0.021	Base
Amazon S3	0.023	9.5%
Google Cloud Platform	0.023	9.5%
Oracle Object Storage – Standard	0.0255	21.4%

Source: Industry, Emkay Research

(ii) Compute pricing comparison

To understand the pricing differences better, we compare virtual machines (Exhibit 138) within similar regions with the same operating system. We have given 2 instances: General Purpose (Exhibit 139) and Compute Optimized (Exhibit 140).

Exhibit 138: Virtual machine of CSPs

Cloud Provider	Virtual Machine
AWS	Amazon Elastic Compute Cloud (EC2)
Azure	Virtual Machines
Google Cloud Platform	Compute Engine
Oracle Object Storage – Standard	Virtual Machines

Source: Industry, Emkay Research

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Exhibit 139: General Purpose on-demand hourly rates

Cloud provider	Instance type	vCPU	RAM (GB)	Price (USD/hr)	Price comparison vs base
Oracle standard	VM.Standard3.Flex	4	16	0.104	Base
AWS general purpose	t4g.xlarge	4	16	0.134	29.2%
GCP general purpose	e2-standard-4	4	16	0.151	45.1%
Azure general purpose	B4ms	4	16	0.166	59.6%

Source: Industry, Emkay Research, Note: Picked instances with four vCPUs and similar RAM

Exhibit 140: Compute Optimized on-demand hourly rates

Cloud provider	Instance type	vCPU	RAM (GB)	Price (USD/hr)	Price comparison vs base
Oracle optimized	VM.Optimized3.Flex	4	8	0.12	Base
AWS compute optimized	c6a.xlarge	4	8	0.153	27.5%
Azure compute optimized	F4s v2	4	8	0.169	40.8%
GCP compute optimized	c2-standard-4	4	16	0.2351	95.9%

Source: Industry, Emkay Research, Note: Picked instances with four vCPUs and similar RAM, except GCP having 16GB RAM

Oracle offers the best pricing in comparison with the market leader. When comparing market leaders, AWS stands out as the relatively lower-priced player. Azure is the most expensive choice for general purpose instances; it is one of the most cost-effective alternatives to compute optimized instances. GCP offers the highest price for compute optimized instances, however this machine has double the RAM of alternatives from AWS, Azure, and Oracle.

Charges paid by customers not only vary basis the CSP they choose, but are also dependent on the geographical location of the service being offered (Exhibits 141-143); we have compared the pricing of various CPUs across North Virginia, London, and Mumbai, for the market leaders (AWS, GCP, and Azure).

We have conducted a comparison on the 'Advanced Tier' offering dedicated, provisioned compute and storage resources with unlimited scaling for workloads requiring consistent performance. Customers are billed monthly, based on the hourly rate of the provisioned compute and storage per node.

Exhibit 141: North Virginia – Price comparison for different vCPUs across market leaders; AWS the most expensive among the 3, while GCP is the cheapest

vCPU	AWS - Starting price (USD/hr)	GCP - Starting price (USD/hr)	Azure - Starting price (USD/hr)	AWS vs GCP	AWS vs Azure	GCP vs Azure
2	0.42	0.36	0.38	17.6%	11.1%	-5.5%
4	0.74	0.59	0.59	26.7%	26.5%	-0.2%
8	1.32	1.12	1.18	18.4%	12.4%	-5.1%
16	2.57	2.24	2.36	15.1%	9.3%	-5.1%
32	4.87	4.47	4.71	9.0%	3.4%	-5.1%

Source: Industry, Emkay Research

Exhibit 142: London – Price comparison for different vCPUs across market leaders; AWS the most expensive among the 3, while GCP is the cheapest

vCPU	AWS - Starting price (USD/hr)	GCP - Starting price (USD/hr)	Azure - Starting price (USD/hr)	AWS vs GCP	AWS vs Azure	GCP vs Azure
2	0.42	0.36	0.38	17.6%	11.1%	-5.5%
4	0.74	0.64	0.68	16.5%	9.4%	-6.1%
8	1.41	1.19	1.36	18.0%	3.4%	-12.3%
16	2.82	2.33	2.72	21.0%	3.4%	-14.5%
32	5.63	5.12	5.45	10.1%	3.4%	-6.1%

Source: Industry, Emkay Research

Exhibit 143: Mumbai – Price comparison for different vCPUs across market leaders; AWS the most expensive among the 3, while GCP is the cheapest

vCPU	AWS - Starting price (USD/hr)	GCP - Starting price (USD/hr)	Azure - Starting price (USD/hr)	AWS vs GCP	AWS vs Azure	GCP vs Azure
2	0.42	0.36	0.38	17.6%	11.1%	-5.5%
4	0.74	0.60	0.62	24.9%	20.3%	-3.8%
8	1.32	1.19	1.24	11.0%	6.9%	-3.8%
16	2.57	2.38	2.48	7.9%	3.9%	-3.8%
32	5.13	4.77	4.96	7.5%	3.4%	-3.8%

Source: Industry, Emkay Research

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Basis our above-mentioned analysis, we conclude that AWS offers basic services at relatively lower pricing in comparison with peers (Exhibits 139 and 140), although when it comes to advanced offerings having add-on services pooled in, AWS tends to charge higher than peers. GCP has positioned itself reasonably as the relatively lower priced player when it comes to advanced services, while Azure is costlier than peers when it comes to basic services, but is lower than AWS in advanced services offerings.

The afore-mentioned requirement does not fully convince us to conclude that AWS is the most expensive among peers, as there are various variables on account of varied requirement of a customer, coupled with the fact that we are merely comparing the most basic set of services being offered. Nevertheless, even if we do assume AWS to be the costlier option among peers, this is largely on account of i) AWS being the market leader globally, and ii) it ends up providing a larger set of services in comparison with peers.

For a better understanding of rentals offered by AWS, Azure, and GCP (Exhibits 144-146), we have, for the relatively advanced services, done a peer comparison of rentals being charged for the Structured Query Language (SQL) server and inputting other details as: 8vCPU, 8GB RAM, 250GB storage. Assuming other parameters are constant, we believe that GCP has comparatively lower charges, followed by Azure and AWS.

Exhibit 144: AWS Pricing – SQL server 8vCPU, 256GB storage in Mumbai priced at USD1,318/month

Source: Industry, Emkay Research

Exhibit 145: Azure Pricing – SQL server 8vCPU, 8GB RAM, 250GB storage in Mumbai priced at USD1,244/month

Source: Industry, Emkay Research

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Exhibit 146: GCP Pricing – SQL server 8vCPU, 8GB RAM, 250GB storage in Mumbai priced at USD1,145/month

Source: Industry, Emkay Research

Other aspects in DC Business

Power requirement

According to IEA estimates, data centers, cryptocurrencies, and artificial intelligence (AI) consumed about 460TWh of electricity worldwide in 2022, ie around 2% of the total global electricity demand. Electricity demand for a data center is mainly from two processes, with computing accounting for 40% of electricity demand of a data center. Cooling requirements to achieve stable processing efficiency similarly make up about another 40%. The remaining 20% comes is covered by other associated IT equipment. Concurring to the pace of deployment, range of efficiency improvements as well as artificial intelligence and cryptocurrency trends, we expect global electricity consumption of data centers, cryptocurrencies and artificial intelligence to range at 620-1,050TWh in 2026, with our base case for demand at just over 800TWh, up from 460TWh in 2022.

**Exhibit 147: Global electricity demand from DC, AI, and cryptocurrencies (2019-26)**
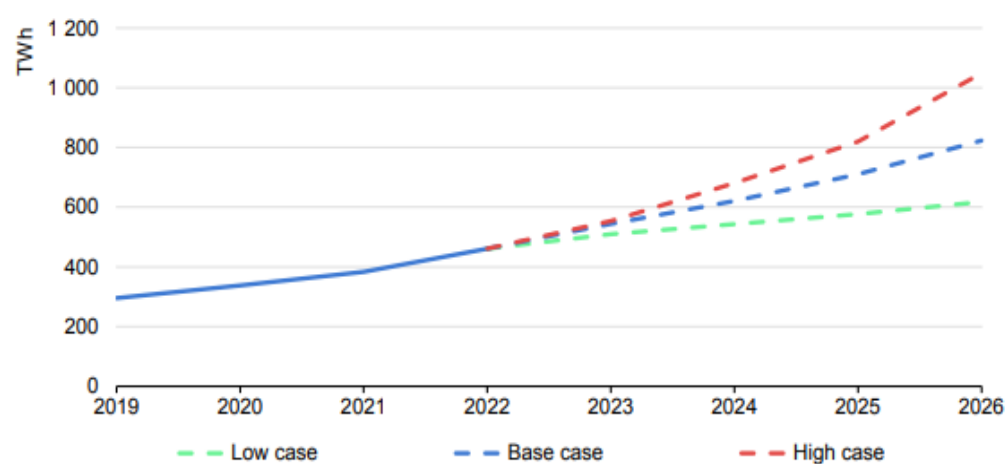
Source: IEA, Industry, Emkay Research

Electricity consumption of DCs has historically shown a wide range of estimates across sources. Studies for the European Union show that the share of DC consumption in total electricity demand in 2022 could range at 1.8-3.5%. In the US, estimates range at 1.3-4.5% in 2022, and in China at 1.9-2.9% according to IEA estimates. In some individual countries, the range of uncertainty is even greater. In Ireland, ~18% of the electricity demand came from this sector in 2022.

Exhibit 148: Increased momentum in regulation and initiatives for improved data collection of the sector in various regions

| Region	Regulation	Indicators to be reported/Requirement to be met
European Union	Energy Efficiency Directive/Delegated Regulation	i) Electricity consumption and share from RE sources ii) Energy efficiency ratings reported as PUE iii) Use of waste heat iv) Incoming and outgoing data traffic
Germany	Energy Efficiency Act: Adopted and expands on EU's Energy Efficiency Directive	i) PUE targets for new and existing data centers (facilities coming online on or after 1-Jul-26 are required to meet a PUE of 1.2). Existing data centers must ensure a max PUE of 1.5 by 2027 and downward to 1.3 by 2030 ii) Required to procure 50% of their electricity from RE sources by Jan-24, increasing to 100% by Jan-27
United States		
Singapore	Digital Infrastructure Act	Intend to mitigate IT systems failures and create reporting requirements for regulated entities to avoid crisis events
Australia	National Australian Built Environment Rating System	Mandate DCs to meet building requirements regarding energy efficiency, water usage, waste management, and indoor environment quality.

Source: Industry, Emkay Research

Exhibit 149: Range of DC electricity consumption estimates (2022)
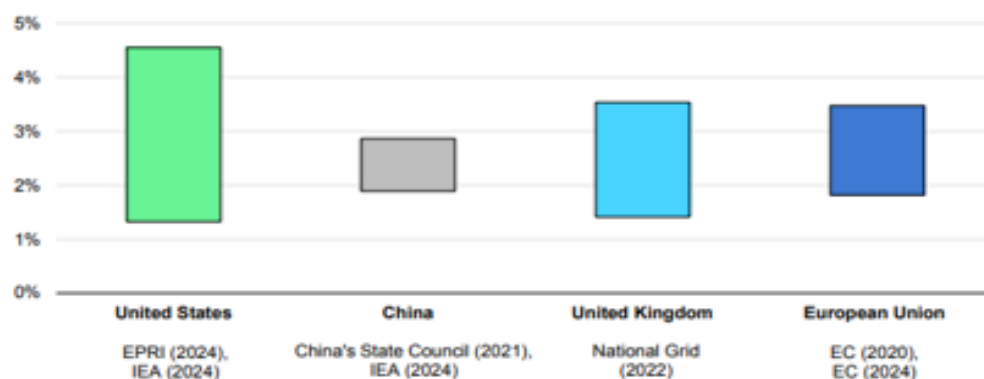
Source: IEA, Industry, Emkay Research

Across multiple regions, power grid connection availability has become challenging, as the data center sector expands alongside accelerating electrification. To circumvent grid connection challenges or to reduce dependency on the grid, some data center providers are increasingly looking into on-site generation. Future estimates for data center and AI energy consumption are highly uncertain. The uncertainty in projections is most notable in the case of USA, where experts have projected data center and AI energy use till 2030. They forecast data centers could account for anywhere between 4% and 10% of national electricity use in 2030.
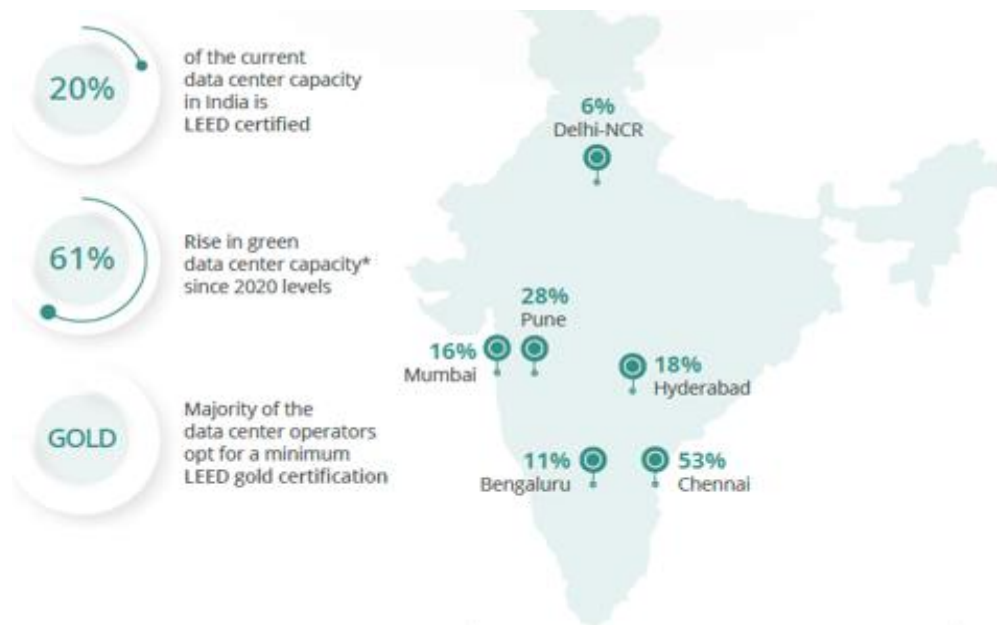
US-based NVIDIA, which accounted for ~95% of the global market share for AI accelerators (as of Feb-24), reported that its new generation of chips over the older generation is 25 times more energy efficient. Despite this, as computation power and efficiency increase, some degree of rebound effects cannot be ruled out, as the corresponding decrease in cost of computation can drive additional demand.

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Exhibit 150: Estimated electricity demand from a traditional DC, dedicated AI DC, and cryptocurrencies (2022 vs 2026)
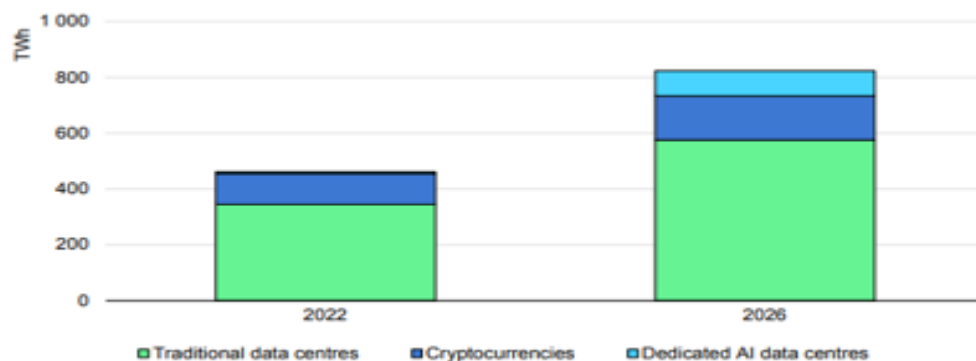
Source: IEA, Industry, Emkay Research

Demand for digital services has grown rapidly over the past few years. Global internet users have more than doubled since 2010 levels, as per the International Energy Agency (IEA), leading to a 20-fold rise in global internet traffic. According to IEA, data centers and data transmission networks account for 1-1.5% of the global electricity use. They also account for about 1% of energy-related greenhouse gas (GHG) emissions significantly contributing to temperature rises and climate changes. As data center footprint in India is expected to bolster going ahead, its share in the carbon footprint is likely to surge significantly. Hence, the upcoming data centers are required to be future-ready as they will have a long-lasting impact on the environment and climate for the next few decades.

Top DC operators are increasingly prioritizing decarbonization of their data center portfolios, committing to achieving their net zero targets by 2050. Decarbonization offers significant benefits to operators, in terms of enhanced rental premiums, asset valuation, brand recognition, and reduced operational costs. While some of the leading operators have already reduced their carbon emissions by 10-20% by adopting sustainable strategies, much more is required for achieving the net zero goals.

Exhibit 151: Green penetration in DC stock of the top-6 cities in India

Source: Industry, Emkay Research

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Alternatives to VRLS batteries

Lithium-ion batteries are increasingly being used with Uninterruptible Power Supply (UPS) applications, to ensure uptime for mission-critical infrastructures in data centers. For companies wishing to deploy distributed computing and edge networks, lithium-ion batteries are ideal for use with IT deployments in remote locations. Lithium-ion batteries require less maintenance and have a higher power density than lead-acid batteries.

Lithium-ion batteries last 2-3 times longer than lead-acid batteries, resulting in fewer battery replacements and lower TCO. These batteries include a Battery Monitoring System (BMS) and other features that help ensure safe battery operation. While the initial cost of lithium-ion batteries is still moderately higher than lead-acid batteries, the difference is shrinking. Over the typical service life of a UPS, a lithium-ion battery system can provide savings of 40% or more.

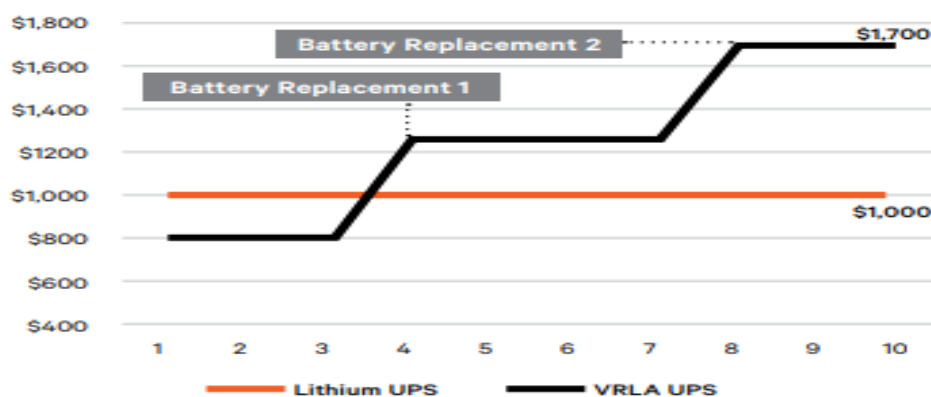**Exhibit 152: Key differences between VRLA and Lithium-ion battery**

Key characteristic	Lead-acid (VRLA)	Lithium-ion
Energy Density	Moderate	High
Lifespan	Medium	Long
Weight	High	Low
Footprint required	Large	Small-Moderate
Recharge	Moderate	Fast
Maintenance Cost	Moderate	Low
Cooling required	Moderate	Low-Moderate
Battery Management	NA	Built-In
Battery Monitoring	Optional	Highly Recommended
Transport concerns	Flexible	Special Requirements
Disposal/Recycle	Common	Evolving
Upfront Cost	Moderate	High

Source: Industry, Emkay Research

In traditional DCs, the battery system is an essential failsafe device. In the event of a power outage, strings of batteries provide power to the UPS during the several minutes of ride-through time in which the DC switches over to an auxiliary power source, such as a second utility feed or generator. In an edge DC, the function of the battery may be slightly different. In many cases, the battery system is in a facility's auxiliary power source. The batteries may provide backup power to the UPS for 30 minutes or more if a power outage occurs. Without alternative power capability, these remote sites rely on stored energy from the UPS batteries to provide adequate time for the utility to be restored.

In either case, the battery system's purpose for traditional or remote DCs is the same – it helps ensure uptime by keeping the IT infrastructure operational. As such, a traditional, remote, or edge facility must have a reliable battery system to ensure continuous operation of the UPS and ongoing IT equipment availability.

**Exhibit 153: VRLA battery vs Lithium ion UPS cost**

Source: Industry, Emkay Research

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Anant Raj, an upcoming player in the DC industry

Anant Raj (ARL), a renowned and seasoned player in the real estate business, has chalked out aggressive plans in the data center and cloud spaces. At present, ARL has 6MW (Location: Manesar) operational DC capacity, and is progressing well for commissioning an incremental 22MW by the end of FY25E. We believe the company is well positioned to reap benefits, primarily because of 1) its strong land bank position leading to relatively lower cost being incurred by the company in setting up DCs, 2) positioning itself to provide cloud services on the back of strategic tie-ups made over the last 2 years, 3) Delhi-NCR as a region is an upcoming DC hub and can cater to the North region DC demand going ahead. We are also confident about the softer aspects (people and processes) considered by the management in setting up this business. The experienced set of personnel on boarded by the management provides assurance regarding the management's direction and focus on building this business.

With front-loading of DC and cloud capex, the management has decided to optimize its financial allocations by i) utilizing cash flow worth ~Rs29bn generated from the real estate business over FY25-27E, and ii) issuing QIP worth ~Rs20bn.

Exhibit 154: Management guidance towards scaling DC size within next 4-5years
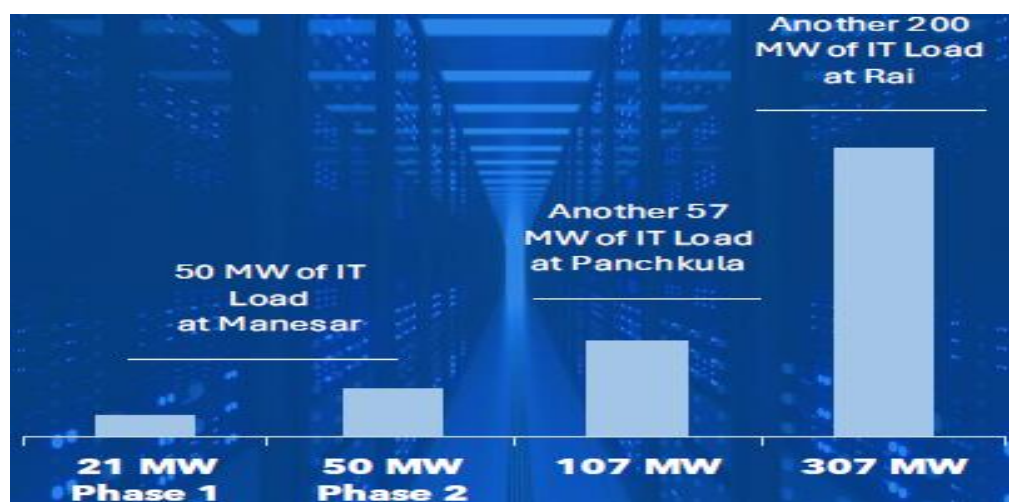
Source: Company, Emkay Research

We project the company to set up 307MW of its DC capacity spread across 3 locations (Manesar: 50MW; Panchkula: 57MW; Rai: 200MW) by FY31E. We build in weighted average rentals, estimating cloud share to increase from the mere 2% (Q2FY25: 0.5MW commissioned) to 25% (FY32E: 77MW cloud capacity), while colocation capacity is likely to be 230MW (FY32E: 75% share). Assuming capacity utilization of 75-85% FY26E onward, we project the optimum capacity utilized to be ~230MW (co-location/Cloud: 173MW/57MW).

We build in EBITDAM in the range of 75-80% across the DC's lifespan (till FY45E), arriving at PATM of ~45-50% across its life. Keeping in mind the high operating cash flows generated, we believe the business will culminate into ~21% IRR (WACC: 12.4%; We/Wd: 80/20), leading to EV/equity value of Rs171bn/Rs167bn (EV/EBITDA: 17.7x, average EBITDA FY27-28E). Basis our assumptions, we arrive at Rs501/share value from the DC industry.

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Key operational factors considered by Anant Raj DCs

The key factors for a data center to successfully deliver its services include:

■ Operational continuity

■ Low latency, and

■ Reliable power supply

■ People and Processes

(i)   Operational Continuity: Ensuring no downtime

To ensure continuous service availability, data center operators provide seamless transition between racks or rooms during maintenance or unexpected outages by offering IT infra (including data back-up facilities) and systems. This redundancy enhances operational resilience and minimizes downtime.

Anant Raj's Manesar DC has operationalized 6MW (Q2FY25), after receiving the pre-requisite certification and approvals (Exhibit 155 depicts the certifications). Tier III/IV DCs require N+1/2N redundancy levels; ARL's management has proactively set up N+N redundancy for UPS at Manesar DC (Tier III DC). This indicates the management's willingness to ensure nil downtime, providing security support, power back-up and strengthening across their building structures.

The management has planned developing the existing and proposed building at Panchkula as a Tier III DC with capacity load of 57MW (brownfield/greenfield: 7MW/50MW); this will provide N+N redundancy. Additionally, the company's DC at Rai, the largest across all three locations (200MW capacity), is being proposed to be developed as a Tier III DC in the existing building (capacity: 100MW) and a Tier III/Tier IV DC for the balance capacity (100MW).

Exhibit 155: Manesar DC Certifications

Source: Company, Emkay Research

Manesar's DC certificates

■ **IGBC Green data center rating system:** The Green Data Center Certification presents a framework for evaluating and enhancing the sustainability of data centers. It encompasses various aspects of data center design, construction, and operation, including site selection, energy efficiency, water conservation, material usage, and indoor environmental quality. The certification also includes a unique Operational Stability Framework that focuses on risk assessment, change management, and preventive maintenance to ensure the continuous and efficient operation of data centers. The certification employs a Credit-based approach, awarding credits for meeting specific criteria and prerequisites. By achieving higher credit scores, data centers can attain certifications, ranging from 'Certified', 'Silver', 'Gold', to 'Platinum', signifying their commitment to environmental responsibility and resource efficiency.

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- **ISO/IEC 27001 certification:** The ISO 27001:2022 Information Security Management System Certification is essential for any organization that aims to establish, enhance, or nurture an information security management system to conform with its established information security policy and requirements. It is an international standard for Information Security Management Systems (ISMS) that helps organizations manage information security risks.

- **ANSI/TIA-942-B Certification:** TIA-942 offers an extensive global scope with transparency and standard nomenclature applicable to any data center size or type. Since its inception in 2005, it has become the go-to resource for data center designers, owners, consultants, suppliers, operators, and users worldwide. TIA members have updated the globally adopted TIA-942 Data Center Infrastructure Standard to address the massive growth of data, emerging technologies like artificial intelligence (AI), and the growing need for sustainability that place unprecedented demands on data center infrastructure.

Exhibit 156: List of ARLs registered DCs

Data Center	State	Rating	Status	Issue Date	Expiry Date
Anant Raj Cloud Private	Haryana	3	Active	27-Oct-24	26-Oct-25
Anant Raj Cloud Private, Manesar Data Centre	Haryana	3	Active	3-Apr-24	2-Apr-27

Source: Industry, Emkay Research

(ii) Low latency and Network Density: Facilitating fast connections

- **Low Latency**

A data center's connectivity to the broader internet ecosystem is a critical component. Low-latency high-speed network connections enable seamless data transmission to and from the facility. Most data centers are connected directly to fiber-optic networks and serve as hubs in global telecommunications systems. The facility's geographical positioning in relation to network nodes, cables, and other internet infrastructure is essential for evaluating the center's value proposition. High-latency connections can reduce a data center's appeal, particularly for applications such as high-frequency trading or cloud gaming.

In order to ensure low latency across its DCs, ARL has on-boarded multiple telecom service providers like Vodafone, BSNL, etc; this provides assurance toward sustained low latency, thus facilitating fast connections for their customers.

- **Network Density**

Network density and connectivity are crucial concepts in understanding how information flows and spreads through networks. These metrics help grasp how tightly interconnected nodes are and how easily they can communicate with each other.

Increased investments in and a more aggressive growth of IXPs would lead to enhanced affordability and improved resilience/reliability, which are crucial for achieving the status of a digital economy superpower. At present, India is ranked the 4th highest with 34 IXPs under operations. Within India, the 34 IXPs are distributed across several location. Majority of these are located in Mumbai (9), followed by Delhi and Kolkata (6 each). ARL's DCs are located in proximity to India's second largest internet exchange footprint (ie Delhi) which is likely to be beneficial for them. Exhibit 157 below depicts the IXPs setup in Delhi. These 6 IXPs have a combined capacity of ~7,000Gbps (~26% of India traffic).

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Exhibit 157: Delhi - IXPs

Name of IXP	Location	Proportion of the local networks that can be reached through this IXP	Capacity (Gbps)	No of members
ExtremeIX Delhi - Extreme IX Delhi	Delhi	2.4%	3600	161
National Internet exchange of India - NIXI Delhi	Delhi	1.6%	1200	106
DE-CIX Delhi	Delhi	1.2%	1500	85
Insta-IX Delhi	Delhi	0.1%	59	10
ANO Peering Exchange - ANI-IX Delhi	Delhi	0.5%	460	32
Apollo-IX Delhi	Delhi	0.1%	140	5
	Total - Delhi	**5.9%**	**6,959**	**399**
	All India	**24.4%**	**27160**	**1772**
	Proportion of Delhi within All India		*25.6%*	*22.5%*

Source: Industry, Emkay Research

(iii) Power supply and rack density

Given the considerable electricity consumption, power supply becomes highly critical for uninterrupted functioning of a DC. Typically, electricity is sourced from the local grid, and power back-up (genset/UPS battery) arrangements are also essential. The physical layout of a data center consists of server racks or bays populated with computing and storage hardware. The density of these racks determines the type of IT workloads the facility can support. High power density data centers, often associated with wholesale operations, offer greater efficiency and are in demand for high-performance computing (HPC), AI applications, and cloud services.

At a data center level, high power density configurations typically start at 10kW per rack, with few facilities able to exceed 30kW per rack. However, advancements in technology are leading to racks capable of supporting between 40kW and 150kW. Conversely, low power density centers cater to more traditional IT workloads, with most facilities currently reporting server rack densities below 8kW.

That said, new data centers dedicated to AI training are also emerging, often located away from traditional business hubs, in areas that are easier to cool (eg Iceland and Nordic countries) and closer to energy sources. This burgeoning new type is less dependent on connectivity and latency and therefore broadens the choice of potential land plots while presenting opportunities for operators to develop facilities in less conventional locations, such as brownfield sites.

Efficient cooling systems and building design are essential for ensuring an optimal environment for equipment while optimizing energy consumption. Backup power systems – such as diesel generators – are also needed to ensure continuous operation during grid outages. The resulting level of reliability supports the essential role played by data centers as a national infrastructure, particularly in times of crisis.

With regard to the 6MW currently under operation, ARL sources electricity directly from Haryana's state grid. Haryana has a relatively higher power deficiency than other states (Exhibit 158), acting as a headwind for setting up DC operators. Nevertheless, ARL has not faced downtime till date; further, the company has ensured power back-up by installing power gensets.

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Exhibit 158: Power demand and supply across key States (FY23)

State/country	Power demand (bn units)	Power supply (bn units)	Power deficiency
Haryana	61.4	60.9	0.8%
Uttar Pradesh	144.3	143.1	0.8%
Maharashtra	186.7	186.6	0.1%
Gujarat	138.7	138.7	0.0%
Tamil Nadu	114.7	114.6	0.1%
Karnataka	75.8	75.8	0.0%
Telangana	77.5	77.5	0.0%
West Bengal	60.1	59.9	0.3%
Pan India	**1511.2**	**1503.7**	**0.5%**

Source: Industry, Emkay Research

Most greenfield DC developments maintain stringent focus on sustainability norms with technology and materials being deployed which ensures not only efficiencies in power usage but also look at facilitating optimization of water usage and lowering of carbon emissions. Given that a major proportion of upcoming DCs are likely to cater to global cloud firms, who themselves follow stringent sustainability norms, it is imperative for operators to put energy efficiency high on the agenda. Exhibit 159 highlights some important developments in this space.

Exhibit 159: Measures taken by renowned DC operators to procure energy from RE sources

Company	Steps taken
STT Global	Entered an agreement with Avaada Energy to procure solar power for its DCs; 34% of STT India's facilities use renewable energy
NTT GDC	Has set up solar and wind power generation facilities for DCs; USD100mn has been earmarked for clean energy initiatives
Nxtra	Partnered with Bloom Energy to deploy fuel cell clean energy tech, to reduce carbon emissions at its DC in Bengaluru
CtrlS	Investing in solar projects in Maharashtra, Karnataka, Uttar Pradesh, to generate ~0.25mn MWh for its DCs
Capita Land	Upcoming DC campus in Mumbai will adopt green building standards with features such as solar panels and waterless cooling systems

Source: C&W, Industry, Emkay Research

ARL is currently in discussions with renewable energy players and will be sourcing a significant portion of its energy, backed by solar power going ahead. As the capacity under operations is not significant at present, it will be eyeing signing a PPA by the end of FY25, after commissioning an additional 22MW IT load capacity. We believe sourcing energy from RE sources is a move in the right direction.

Further, the management is tackling the issue of short lifespan of batteries installed in DCs, by planning to replace current batteries with Lithium-ion (Li-Ion) batteries. Notably, one component of a data center that needs to be replaced much more frequently is batteries, to safeguard facilities from power disruptions. Typically, batteries have a useful life and are replaced every 5-6 years, meanwhile li-ion batteries can last up to 15 years. They are 60-70% lighter and 40-60% smaller than VRLA batteries, and require comparatively less maintenance.

(iv) People and Processes

With people, the company is particularly focused on the sales and technical functions, which it believes are the "soft" attributes but just as important as the actual products and services being provided to customers. The line between hyperscale and colocation eventually blurs, especially with sharp growth in enterprises looking for hybrid cloud solutions. Having a sales team that can effectively assess the increasingly complex needs of customers is critical.

In US markets, a specialized sales team for hyperscale customers is a must, given that only half a dozen cloud providers like Microsoft, Amazon, and Google dominate the market. In our opinion, though India hyperscale is relatively at a nascent stage of its adoption, and is currently a colocation based market, it is essential for upcoming players to create a specialized team overlooking the needs of customers.

We believe Anant Raj has been able to bring together a team with strong knowhow in the data center industry. This is likely to benefit the company in pacing the set-up of data centers across

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their locations, identifying problems and finding resolutions. Exhibit 160 gives details of the core team established by the management.

Exhibit 160: Core data center team set up by ARL management

Name	Designation
Gaurav Sharma	Chief Technology Officer
Gagan Singh	Chief Business Officer Data Centers
Sameer Srivastava	Chief Operating Officer
Gaurav Sharma	Vice President – Data Centers, Real Estate and IR
Kulbir Singh	Sr GM - Projects
Niranjan Lal Sharma	Sr GM - Electrical
Ravi Mohan Khurana	Vice President - Services and Data Centers

Source: Industry, Emkay Research

Within the enterprise market, a sales team focused on key verticals and strong partners within the sales channel make for a set-up that increases the probability of success. We believe Anant Raj will be a major benefactor of their tie-up with Google and Orange businesses services for attracting a large number of customers.

A solid technical team that can ensure smooth development of a colocation and hyperscale product as well as deployment of customer infrastructure also goes a long way in building sticky customer relationships. The icing on the cake, in our view, is having processes to ensure the right people are in place, and effectively working together in an integrated way to meet client needs. People and processes are a 'soft' attribute, but are just as important in our opinion vs the actual products and services being provided.

How is Anant Raj placed in NCR

NCR is one of the fastest growing DC markets in India, with majority of the DCs being developed in the Noida and Gurugram markets; factors supporting the growth story of DCs are:

■ Haryana and Uttar Pradesh state government initiatives to promote the growth of IT and ancillary industries.

■ Availability of economical land parcels, uninterrupted power supply.

■ The increasing demand for data center space from enterprises, government agencies and cloud service providers.

North India is home to several MNCs, IT companies, and start-ups. These organizations are driving the demand for data center space, as they require reliable and secure infrastructure to store and manage their data. The NCR in particular has strong connectivity infrastructure, a well-connected fiber optic network, reliable power supply, making it an attractive location for DCs. With only selective DC cities well established to meet the burgeoning IT infrastructure requirement for North India, we believe it will be a strong growth driver for DC providers setting up capacity in North India.

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Exhibit 161: State/region-wise domestic listed company offices; presence of corporates in North India bodes well for DC players like ARL

Sector	Maharashtra	North India	Uttar Pradesh	Tamil Nadu	Karnataka	Andhra Pradesh	Kerala	West Bengal	No of Head Offices/ Corporate Offices
Finance	215	104	26	20	7	6	10	36	**424**
Miscellaneous	97	60	19	15	8	6	-	18	**223**
Retail	61	38	11	9	8	4	2	10	**143**
Real Estate	41	28	8	10	7	-	-	4	**98**
IT	33	11	11	9	16	12	1	3	**96**
FMCG	22	35	10	8	5	1	2	12	**95**
Chemicals	58	12	7	4	1	5	1	4	**92**
Healthcare	49	18	1	4	8	7	-	-	**87**
Capital Goods	31	7	9	7	14	-	1	9	**78**
Travel and leisure	28	18	7	7	2	5	-	5	**72**
Metals and mining	26	21	5	2	2	3	-	11	**70**
Auto and Auto Ancillaries	12	27	5	10	3	2	-	1	**60**
Infrastructure	20	14	7	5	-	3	-	7	**56**
Consumer Durables	15	15	5	2	4	-	-	1	**42**
Cement and Building Material	8	14	2	4	1	-	-	10	**39**
Logistics	15	11	-	1	2	-	-	3	**32**
Telecom	4	6	1	-	3	-	-	-	**14**
E-commerce	5	3	3	-	-	-	-	2	**13**
Power	1	4	1	3	1	-	-	2	**12**
Oil and Gas	5	3	1	-	-	-	-	-	**9**
Total	**746**	**449**	**139**	**120**	**92**	**54**	**17**	**138**	**1,755**

Source: Capital Line, Industry, Emkay Research

NCR, including Delhi and its suburbs, is an upcoming DC hub. Proximity to the seat of the government and the large consumer base makes it a prime location for both local and multinational companies across industries.

- **Strengths**

  State support: As it is located near the capital, investors benefit from direct government intervention and favorable policy support for investment in data center infrastructure.

  Huge consumer base: The region having one of the largest consumer bases in the country, consumer demand for data services is explosive in this region. This works to the advantage of e-commerce companies and cloud service providers.

  Close industrial centers: Proximity to industrial and commercial business hubs such as Gurgaon and Noida magnifies the appeal for investments in data center operations.

- **Weakness**

  Extreme weather: Past records have shown the most extreme temperate ranges from sweltering summers to cold winters. This increases the cost of climate control for data centers.

  High power costs: The higher cost of electricity in Delhi-NCR compared with other regions can impact the overall operational costs for data centers over the long run.

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Exhibit 162: North India – 23 DCs, 15 providers
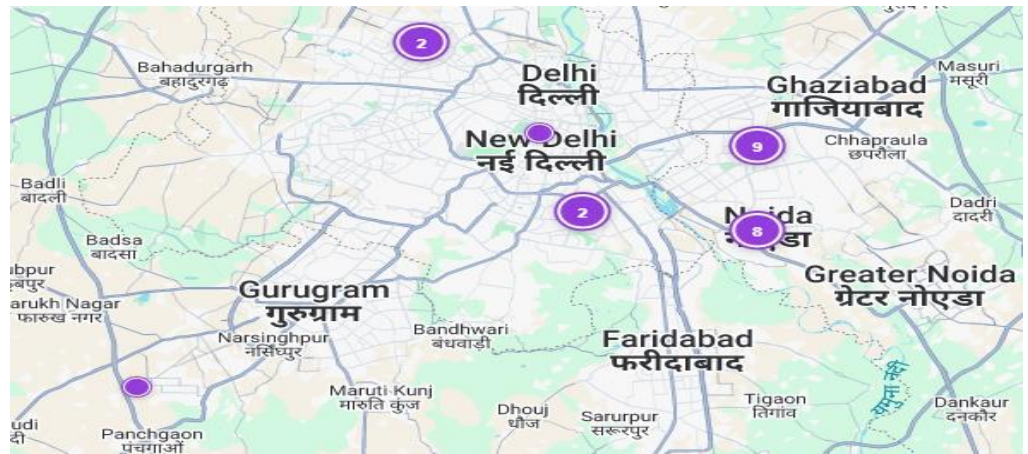
Source: Industry, Emkay Research

Exhibit 163: NCR's existing 113MW capacity market share
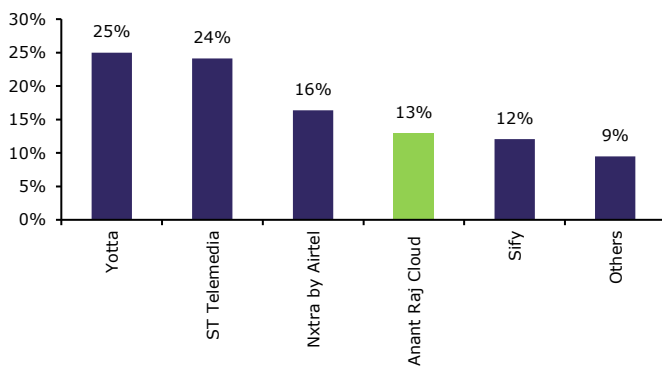
Source: C&W, Industry, Emkay Research

Exhibit 164: The 2028 projected capacity to grow to 361MW
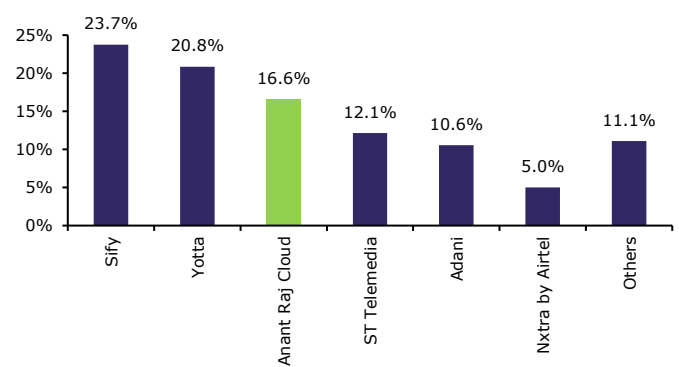
Source: C&W, Industry, Emkay Research, Note: Projected capacity does not incorporate updated timelines across DC operators

Anant Raj will be setting up ~307MW worth of DC capacity, spread across 3 sites (Manesar: 50MW, Panchkula: 57MW, Rai: 200MW). Current operational capacity stands at 6MW, which is expected to increase to 28MW by the end of FY25E. Going ahead, we build in capacity to grow to 102MW by FY27E, and achieve full potential of 307MW by the end of FY31E.

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Exhibit 165: Details of a location-wise ARL DC

Particulars	Manesar	Panchkula	Rai	Total
Size (MW)	50	57	200	307
Brownfield Capacity (MW)	50	7	100	157
Greenfield Capacity (MW)	-	50	100	150
Projected commissioning of capacity				
Live IT Capacity (till H1FY25)	6	-	-	6
FY25E	15	7	-	22
FY26E	15	5	10	30
FY27E	14	15	15	44
FY28E	-	20	35	55
FY29E	-	10	65	75
FY30E	-	-	45	45
FY31E	-	-	30	30
Tier	III	III	III/IV	
Components				Refer to Exhibit 168 for all sites
Rack Density	12-25kW	12-25kW	12-25kW	12-25kW
Redundancy	UPS: N+N Others: N+1	UPS: N+N Others: N+1	UPS: N+N Others: N+1	UPS: N+N Others: N+1
PUE	1.4-1.5	1.4-1.5	1.4-1.5	1.4-1.5

Source: Company, Emkay Research

Exhibit 166: Capacity commissioning projected to reach 307MW by FY31

ARL DC Capacity (MW)	FY23	FY24	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	Total DC Capacity
Manesar - Brownfield	3	3	15	15	14	-	-	-	-	50
Panchkula -Brownfield	-	-	7	-	-	-	-	-	-	7
Panchkula - Greenfield	-	-	-	5	15	20	10		-	50
Rai – Brownfield	-	-	-	10	15	25	35	15	-	100
Rai – Greenfield	-	-	-	-	-	10	30	30	30	100
Total Addition in FY	**3**	**3**	**22**	**30**	**44**	**55**	**75**	**45**	**30**	**307**
Cumulative Capacity	**3**	**6**	**28**	**58**	**102**	**157**	**232**	**277**	**307**	
	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	Total DC Capacity
Brownfield Capacity	3	3	22	25	29	25	35	15	-	157
Greenfield Capacity	-	-	-	5	15	30	40	30	30	150
Total Commissioning	**3**	**3**	**22**	**30**	**44**	**55**	**75**	**45**	**30**	**307**
Cumulative Capacity	**3**	**6**	**28**	**58**	**102**	**157**	**232**	**277**	**307**	

Source: Company, Emkay Research

Exhibit 167: Location details of ARL's DC site

Particulars	Anant Raj Tech Park, Manesar	Anant Raj Tech Park, Panchkula	Anant Raj Trade Center, Rai
Capacity (MW)	50	57	200
Tier	III	III	III/IV
Projected commissioning of full capacity	FY27E	FY30E	FY31E
Land area (acres)	10	9.23	25
Location	IMT Manesar, New Gurugram, Haryana	Panchkula, Haryana	On National Highway (NH-1)
Total constructed area (msf)	1.8	1.6	5.1
Leasable area (msf)	1.2	1.1	3.4

Source: Industry, Emkay Research

We believe our FY25-30E brownfield capacity (157MW) addition is in line with management guidance; although we have pushed the greenfield capacity (150MW) commissioning target to FY31E vs guidance of 2030.

Exhibit 168: ARL has partnered with industry leaders to source DC equipment

Source: Company, Emkay Research

We believe that in our base case scenario, capacity in its entirety is projected to be commissioned by FY31E. This timeline is further pushed back to FY33E in our bear case scenario, and is in line with management projection of FY30E in our bull case scenario.

Exhibit 169: Projected capacity commissioning timelines

Cumulative DC Capacity (MW)	FY24	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E	FY33E
Bear Case	6	28	43	72	102	147	182	222	277	307
Base Case	6	28	58	102	157	232	277	307		
Bull Case	6	28	58	112	187	242	307			

Source: Company, Emkay Research

Cost advantage: Uplifting the return profile of ARL

A mature ecosystem for IT and digitally-enabled services, along with relatively cheaper real estate, is enabling India to build data centers at the lowest cost compared with most other nations. The median price of constructing a data center in India is estimated at USD6.8mn per MW of capacity, significantly lower than in most other APAC nations. We strongly believe India is poised to become one of the world's largest data center hubs.

Exhibit 170: APAC DC cost index - 2023
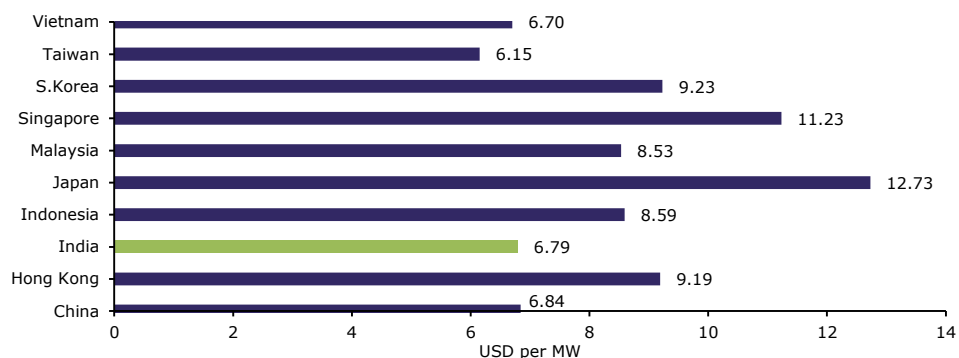
Source: C&W, Industry, Emkay Research

Exhibit 171: DC development cost split
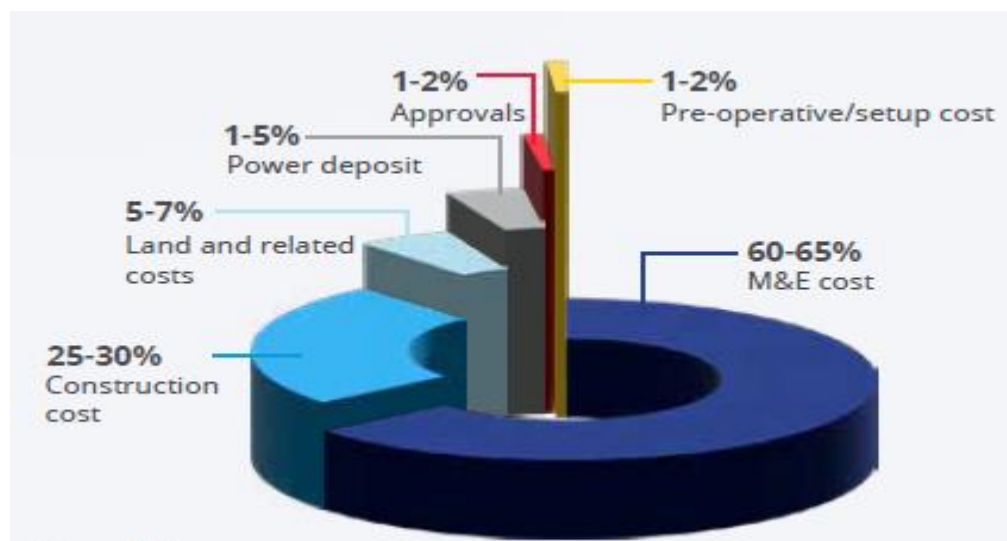
Source: Colliers, Industry, Emkay Research, Note: Construction costs include both, hard costs (labor, materials, utilities) and soft costs (design fees, legal fees, taxes); M&E is Mechanical & Electrical cost

ARL, a legacy real estate business, and has over the years acquired considerable land bank across Delhi and its vicinity. The sites (Manesar, Panchkula and Rai) on which DC is being setup have been a part of ARL's portfolio for a reasonable amount of time. A new operator in DC industry is likely to incur capital expenditure in the range of ~Rs5-6bn/MW.

For the entire 307MW, ARL will not be incurring cost to acquire land, unlike other players. Also, a certain portion of the aforementioned sites have a preliminary level of infrastructure already built; in order to setup DC capacity on existing infrastructure (brownfield capacity: 151MW), the management is likely to incur capex of ~Rs260mn/MW. Meanwhile, the management has possession of land, but will have to setup the infrastructure from scratch. Herein it will incur Rs340mn/MW in order to setup a greenfield capacity (150MW). The plan to setup capacity of 301MW is seeing equal distribution between brownfield and greenfield capacity addition.

Exhibit 172: Capex/MW for ARL

Capex	Capacity (MW)	Capex per MW (Rs mn)
Brownfield capex	151	260
Greenfield capex	150	340
Total	**301**	

Source: Company, Emkay Research

We have built in an escalation clause of 2% in costing, over the course of capacity addition. Projected capex for brownfield/greenfield capex over FY25-31E stands at Rs41bn/Rs55bn, incurring a capex of ~Rs96bn in totality. Provided a new entrant does not have the advantage of owning the land, and previously set up a building structure (in case of brownfield capacity), the cost to be incurred by them would have been ~Rs160bn (67% higher than ARL's capex).

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Exhibit 173: The ~Rs96bn project capex to be built in, for setting up 301MW of additional DC capacity

Capex	Capex per MW (Rs mn)	Escalation Rate	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	Capex Projected (Rs mn)
Brownfield capex										
Capex (Rs mn/MW)	260	2%	260	265	271	276	281	287	-	
Capacity addition (annual)			22	25	29	25	35	15	-	151
Total Capex			**5,720**	**6,630**	**7,845**	**6,898**	**9,850**	**4,306**	**-**	**41,249**
Greenfield capex										
Capex (Rs mn/MW)	340	2%	340	347	354	361	368	375	383	
Capacity addition (annual)			0	5	15	30	40	30	30	150
Total Capex			**-**	**1,734**	**5,306**	**10,824**	**14,721**	**11,262**	**11,487**	**55,334**
Total Capex (Rs mn)			**5,720**	**8,364**	**13,151**	**17,722**	**24,571**	**15,568**	**11,487**	**96,583**

Source: Company, Emkay Research

Ashok Cloud

How Anant Raj is set to be different

The management decided to foray into cloud services with the launch of 'Ashok Cloud'. The need for a differentiated platform and creating a sustainable competitive advantage in order to maintain market share, market leadership and an attractive return profile will become increasingly important. When providing commoditized products services, in this case data center racks, margins and profitability can erode, the market competition can increase going ahead on the back of increasing number of players, in our view.

Hyperscale and co-location are currently two distinct markets, but keeping in mind the pattern followed across other developed economies, there is a high possibility of the line between these two services blurring ahead. Signing large hyperscale deals will be undoubtedly helpful. Large enterprises are increasingly moving to hybrid cloud and multi-cloud solutions that straddle both markets, and are gradually moving toward providers that can provide one-stop-shop solutions.

ARL had been looking for a strategic alliance with an international partner with strong expertise and technical know-how in developing data centers, and has been positioning itself as the integrator for setting up cloud based services. ARL signed a strategic MoU with Orange Business Services India Technology (Orange), wherein Orange will help design, build, and operate the company's Cloud Platform, establish servers at ARL's DC, and promote its colocation and cloud platform services to customers.

Orange plays the role of a system integrator, wherein it will be sourcing components through multiple vendors to setup the cloud capacity. Ashok Cloud has successfully tied up with the likes of VMWare, CISCO, Palo Alto, F5, and NetApp, from whom it will be sourcing its needs for setting up a cloud infrastructure; Orange will ensure integration of the cloud systems.

Within the existing 6MW capacity, 0.5MW has been set aside for offering cloud services to customers. At present the management is eyeing the possibility of providing IaaS based services in association with Orange business services. Exhibit 175 highlights the list of services likely to be offered to customers under Ashok Cloud. Going ahead, the management targets 75:25 colocation:cloud proportion in the 307MW DC capacity. Given that the cloud services to be offered by ARL are at a nascent stage and will eventually pickup, we build in a gradual rise in the share of Ashok Cloud over the course of FY25-34E, after which we expect the proportion to be maintained henceforth.

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Exhibit 174: ARL – Comprehensive cloud services

Source: Company, Emkay Research

Exhibit 175: Critical cloud services offered to customers on the Ashok Cloud

Category	Description	Service Offered
Compute	Scalable compute resources tailored to meet business needs	Virtual Machines Physical Servers
Storage	Store and manage data with secure, scalable storage solutions designed for reliability and performance	Block Storage for High Performance Object Storage NFS Volumes
Backup and DR	Safeguard critical data with comprehensive backup and disaster recovery solutions	Backup/Restore Disaster Recovery Archive Long Term Archive
Network and Security	Seamless connectivity and robust protection with advanced network and security solutions	Core Firewall Anti Virus WAF (Web Application Firewall) Load Balancer No Cost for Ingress & Egress traffic
OS Management	Streamline operations with efficient OS management, providing seamless updates, patches, and support	Operating System Installation & Configuration Patch Management Operating System troubleshooting
Migration	Seamless cloud migration services, ensuring a smooth transition to the cloud	On Premises assessment and Migration Multi Cloud Migration

Source: Company, Emkay Research

Exhibit 176: ARL targets cloud service offerings

Source: Company, Emkay Research

Exhibit 177: Colocation-cloud share of 75:25 to be achieved by FY34E

Proportion of DC capacity	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E	FY33E	FY34E
Co-Location	98%	95%	93%	90%	88%	85%	82%	80%	78%	75%
Cloud Services	2%	5%	7%	10%	12%	15%	18%	20%	22%	25%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Capacity under Co-Location (MW)	27.5	55	95	141	204	235	252	246	239	230
Cloud Services (MW)	0.5	3	7	16	28	42	55	61	68	77
Total Capacity (MW)	**28**	**58**	**102**	**157**	**232**	**277**	**307**	**307**	**307**	**307**

Source: Company, Emkay Research

As discussed above, a cloud service provider is responsible for providing both, hardware and software services to customers, unlike colocation services. Factoring in the cloud services being offered, management guidance on capex for setting up cloud services is Rs1bnpa/MW. With the targeted colocation-cloud share of 75:25, we project share of cloud offerings rising to ~77MW by FY34E, building in a capex of ~Rs85bn over the same period. In totality, we build in ARL incurring capex of ~Rs181bn over FY25-34E, spread across data center capacity setup (brownfield/greenfield DC capacity: Rs41bn/Rs55bn), over and above which Rs85bn is projected to be incurred toward setting up infrastructure for cloud service offerings.

Exhibit 178: Capex of ~Rs85bn to be incurred for setting up cloud infrastructure and service

Cloud Service Set-up	Escalation Rate	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E	FY33E	FY34E	Total
Cost per MW (Rs mn)	2%	1,000	1,020	1,040	1,061	1,082	1,104	1,126	1,149	1,172	1,195	
Cloud Capacity achieved pa (MW)		0.5	2.4	4.2	8.6	12.1	13.7	13.7	6.1	6.1	9.2	**76.8**
Cloud Setup Capex pa (Rs mn)		**504**	**2,444**	**4,411**	**9,084**	**13,141**	**15,137**	**15,440**	**7,053**	**7,194**	**11,007**	**85,414**

Source: Company, Emkay Research

Exhibit 179: DC business projected to incur ~Rs181bn capex over FY25-34E

Capex (Rs mn)	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E	FY33E	FY34E	Total Capex (Rs mn)
Brownfield capex	5,720	6,630	7,845	6,898	9,850	4,306	-	-			41,249
Greenfield Capex	-	1,734	5,306	10,824	14,721	11,262	11,487	-	-	-	55,334
Cloud infrastructure	504	2,444	4,411	9,084	13,141	15,137	15,440	7,053	7,194	11,007	85,414
Capex across DC business	**6,224**	**10,808**	**17,562**	**26,806**	**37,712**	**30,704**	**26,927**	**7,053**	**7,194**	**11,007**	**181,997**

Source: Company, Emkay Research

We are confident that Anant Raj would benefit from providing cloud services at its data centers. Teaming up with Google and Orange Business will help ARL unlock value from its cloud service business.

ARL's agreement with Google acts as a tag of assurance for customers. ARL will be able to broaden the horizon of services it offers, tap into customers from diversified markets, improve chances of on-boarding government-backed organizations, and will nonetheless improve its learning curve. Provisioning for cloud services will also culminate into enhancement in yields, achieving breakeven at a quicker pace and, most of all, solidifying market share in the cloud servicing space. However, cloud is still in the infant stages for ARL, and is more in a wait-and-watch mode, till significant amount of capacity addition takes place, followed by on-boarding of clients. We remain optimistic on the upcoming prospects, and are hopeful of the management strengthening this business going ahead.

Anant Raj rentals

ARL's colocation rentals of Rs9mn/MW/month have been built in by us is; this assumption is in line with management guidance. The company will prioritize setting up DC capacity and on-boarding customers in the colocation space. Management's cloud service rentals guidance is ~Rs150mnpa/MW/month, but we build in a more conservative approach and bake in ~Rs97mn/MW/month (35% discount) from these services. Cloud services are in the trial phase now, and will take time to ramp up. Additionally, to make cloud services lucrative for customers, we believe ARL will need to taper down its pricing to initially test the stickiness of customers with their services. We have built in a 3% annual escalation in our rentals.

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Exhibit 180: Data Center – Rental assumptions

Data Center - Rental assumptions	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E	FY33E	FY34E	FY45E
Co-Location (Rs mn/MW/month)	9	9	9	10	10	10	10	11	11	11	16
Cloud services (Rs mn/MW/month)	97	97	100	103	107	110	113	116	120	123	171
Inflation (Rent escalation)	*3%*										
Data Center Capacity - Break-up											
Co-Location	98%	95%	93%	90%	88%	85%	82%	80%	78%	75%	75%
Cloud Services	2%	5%	7%	10%	12%	15%	18%	20%	22%	25%	25%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Capacity under Co-Location (MW)	27	55	95	141	204	235	252	246	239	230	230
Cloud Services (MW)	1	3	7	16	28	42	55	61	68	77	77
Total Capacity (MW)	**28**	**58**	**102**	**157**	**232**	**277**	**307**	**307**	**307**	**307**	**307**
Weighted Avg Rentals (Rs mn/MW/month)	**9**	**11**	**14**	**16**	**20**	**22**	**26**	**30**	**33**	**36**	**55**
Capacity Utilization	**100%**	**90%**	**88%**	**86%**	**84%**	**82%**	**80%**	**78%**	**75%**	**75%**	**75%**

Source: Company, Emkay Research

ARL, further to its colocation services, successfully formed a strategic alliance and empaneled RailTel (3MW) and TCIL (2.5MW) for its 5.5MW currently under operations. Additionally, the company has collaborated with TCIL to offer cloud services (0.5MW), thus enhancing its infrastructure and service offerings.

DC business – Financial Analysis

Factoring in assumptions regarding i) capacity addition, ii) rentals, iii) proportion between colocation-cloud, and iv) capacity utilization levels, we build in DC capacity growing to 28MW/58MW/102MW during FY25-27E; the proportion of cloud capacity is likely to increase, from 0.5MW at present to ~6MW by end-FY27E. Prioritization of brownfield capex (infrastructure is ready to an extent, minor modifications required in the structure, followed by installation of DC equipment) in the initial phases will lead to fast-paced capacity addition. We build in monthly rentals for colocation/cloud of Rs9mn/Rs97mn per MW and arrive at revenue of Rs324mn/Rs3.2bn/Rs8.5bn for FY25E/FY26E/FY27E. We factor in utilization levels initially remaining high on account of the smaller proportion of capacity being operationalized; we depict utilization levels at 100%/90%/88% levels over FY25-27E. At full capacity, we believe the DC will be able to generate maximum revenue/EBITDA of Rs151bn/Rs113bn (FY33-45E utilization levels: 75%).

Exhibit 181: Financial Snapshot of DC business

Financial Analysis	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY45E
Revenue (Rs mn)	324	3,203	8,468	16,966	30,862	50,402	68,653	150,759
EBITDA (Rs mn)	**259**	**2,498**	**6,521**	**12,894**	**23,147**	**37,801**	**52,176**	**113,069**
EBITDAM	*80%*	*78%*	*77%*	*76%*	*75%*	*75%*	*76%*	*75%*
Depreciation (6% pa)	467	1,116	2,169	3,778	6,040	7,883	9,498	11,044
EBIT (Rs mn)	**(208)**	**1,383**	**4,351**	**9,117**	**17,107**	**29,919**	**42,678**	**102,025**
Interest (10% finance cost)	-	-	351	887	1,642	1,756	1,794	-
PBT (Rs mn)	**(208)**	**1,383**	**4,000**	**8,230**	**15,465**	**28,163**	**40,884**	**102,025**
Tax (25.6% pa)	(53)	354	1,024	2,107	3,959	7,210	10,466	26,119
PAT (Rs mn)	**(155)**	**1,029**	**2,976**	**6,123**	**11,506**	**20,953**	**30,418**	**75,907**
PATM	*-47.7%*	*32.1%*	*35.1%*	*36.1%*	*37.3%*	*41.6%*	*44.3%*	*50.3%*

Source: Industry, Company, Emkay Research

DC capacity addition during the initial years of the business leads to front loading of capex; we project DC business capex of ~Rs181bn to be incurred over FY25-34E. This factors in the 301MW of capacity to be commissioned across the 3 sites, along with the capex incurred toward setting up the cloud business.

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After operationalizing DC capacity, operators benefit from the minimal maintenance cost they incur. It is on the back of this low maintenance cost that DC operators generate high cash flows. We project margins to remain range bound at 75-80% across the DC's life. We assume the life of DC to be 20 years, over the span of which we depreciate the assets at 6%. With 20% debt considered in our assumptions, we build in financial cost to be marginal. High operating margins are expected to be converted to PAT margin falling in the range of 45-55% over the DC's lifespan.

The DC business, when discounted at 12.4% WACC (We/Wd: 80/20), culminates into ~21% IRR in our base case scenario. Using the discounted cash flow method, we arrive at EV of Rs171bn, factoring in terminal growth rate of 3%. We believe the equity value to be generated from the DC business is ~Rs167bn, which translates into Rs501/sh for investors. ARL's DC business EV/EBITDA stands at 17.7x (average FY27-28E EBITDA), largely on account of the company still being at the initial stages of ramping up operations.

Exhibit 182: Our FY25E-45E IRR stands at ~21% for DC

IRR (Rs mn)		FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY45E
PAT		(155)	1,029	2,976	6,123	11,506	20,953	30,418	75,907
Add: Depreciation		467	1,116	2,169	3,778	6,040	7,883	9,498	11,044
Less: Real Estate cashflow infusion		6,224	10,808	14,050	21,445	30,170	24,564	21,541	0
Cash Flows		**(5,912)**	**(8,663)**	**(8,904)**	**(11,545)**	**(12,623)**	**4,272**	**18,375**	**86,951**
PV @ 12.4%		(5,575)	(7,267)	(6,644)	(7,662)	(7,451)	(382)	6,246	15,580
IRR	**20.9%**								

Source: Company, Emkay Research

Exhibit 183: WACC @ 12.4%

Particulars	Proportion
We	80%
Wd	20%
Beta	1.25
Rf	6.8%
Rm	5.5%
WACC	12.4%

Source: Company, Emkay Research

Exhibit 184: DC business equity value/share estimated at Rs501

FCFF (Rs mn)	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY45E
EBIT	(208)	1,383	4,351	9,117	17,107	29,919	42,678	102,025
Tax rate @ 25.6%	(53)	354	1,024	2,107	3,959	7,210	10,466	26,119
NOPAT	**(155)**	**1,029**	**3,327**	**7,010**	**13,148**	**22,709**	**32,212**	**75,907**
Add: D&A	467	1,116	2,169	3,778	6,040	7,883	9,498	11,044
Add: Capex	6,224	10,808	17,562	26,806	37,712	30,704	26,927	-
FCFF	**(5,912)**	**(8,663)**	**(12,065)**	**(16,018)**	**(18,524)**	**(113)**	**14,783**	**86,951**
PV of FCFF	(5,575)	(7,267)	(9,002)	(10,631)	(10,935)	(59)	6,904	7,877
Terminal Value	3%							
Sum of PV	163,807							
PV of terminal value	7,409							
EV	171,215							
Debt	4,131							
Equity value	167,084							
Equity value / share	**501**							

Source: Company, Emkay Research

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Company Financial Analysis

Revenue growth to be higher, driven by data center business; expect earning CAGR of 35% (FY24-27E)

In the residential business, the company recognizes revenue on a percentage of completion basis (POCM). Accordingly, despite projects getting sold, revenue recognition would be staggered given the time taken for construction. Hence, we expect revenue CAGR of this segment at 8%, a growth to Rs20.9bn during FY25-27E. For the company's DC business, we arrive at revenue of Rs324mn/Rs3.2bn/Rs8.5bn for FY25E/FY26E/FY27E. We consider utilization levels initially remaining high on account of the smaller proportion of capacity being operationalized; utilization levels are likely to be 100%/90%/88% over FY25-27E. We project ARL's revenue FY24-27E CAGR at 26.4%, with real estate sales/DC business revenue share to increase to 70%/28% by FY27E (vs FY24 real estate/DC business revenue share: 96%/4%). We project FY25-27E EBITDAM for the DC business to range at 77-80%.

Overall, we expect EBITDA CAGR of 52%, at Rs11.7bn during FY24-27E, mainly led by strong margin expansion of 1,640bps to 39% during this period, on the back of increasing contribution from the data center business.

Exhibit 185: FY24-27E revenue CAGR at 26.4%
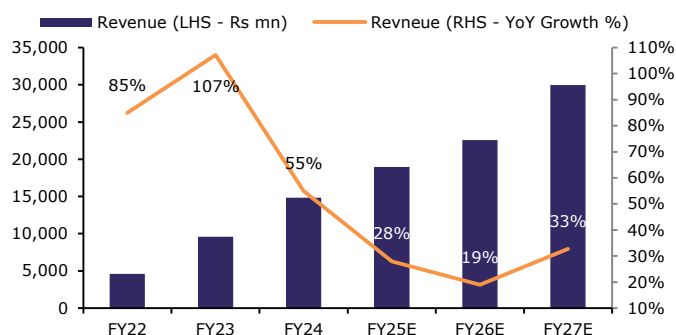
Source: Company, Emkay Research

Exhibit 186: Revenue from DC business projected to grow to 28% by FY27E
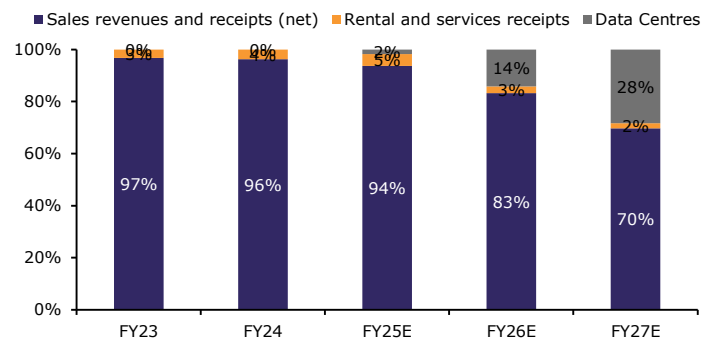
Source: Company, Emkay Research

Exhibit 187: EBITDA CAGR projected at 52% over FY24-27E
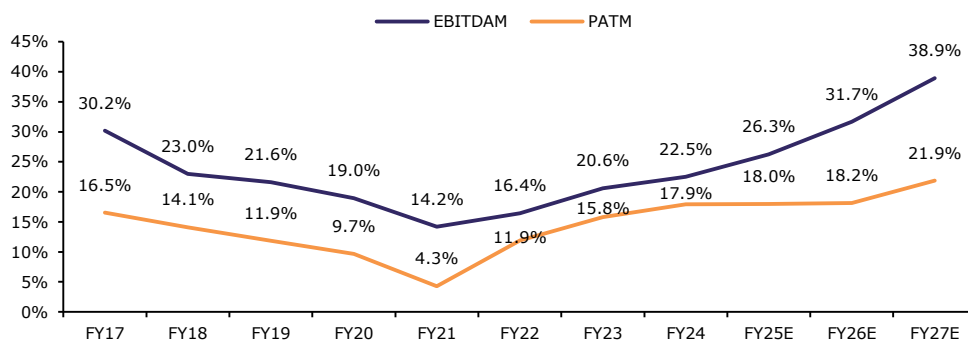
Source: Company, Emkay Research

Collections from residential business, QIP money to be utilized as growth capital

On the back of the strong residential sales CAGR of 18% during FY24-27E, we expect collections CAGR at 39% to Rs36.3bn over the same period. This would lead to a strong cashflow stream for the company over the medium term. We anticipate ~Rs29.1bn cumulative net cash inflows (excluding construction and SG&A costs) during FY25-27E. Additionally, ARL is planning to raise Rs20bn via QIP which would be utilized as growth capital toward scaling up the data centers business. Management targets cloud service share to expand to 10% by end-FY26E, while our estimate is 5%. Building in a 10% cloud service share will lead to additional capex of ~Rs3.2bn/Rs2.7bn over FY26E/FY27E, respectively.

Expansion of DC and cloud infrastructure capacity during the initial years of the business leads to front loading of capex; we project capex of ~64bn to be incurred over FY25-27E. This capex will be funded through i) cash flow generated from the real estate business over FY25-27E, ii) infusing cash flow generated from operational DC capacity, iii) net debt to increase by ~Rs10bn as an additional source of funding. However, as management has elected to raise QIP of ~Rs20bn, successful completion of the QIP is rather likely to lead to deleveraging.

Exhibit 188: Projecting capex of Rs64bn during FY25-27E
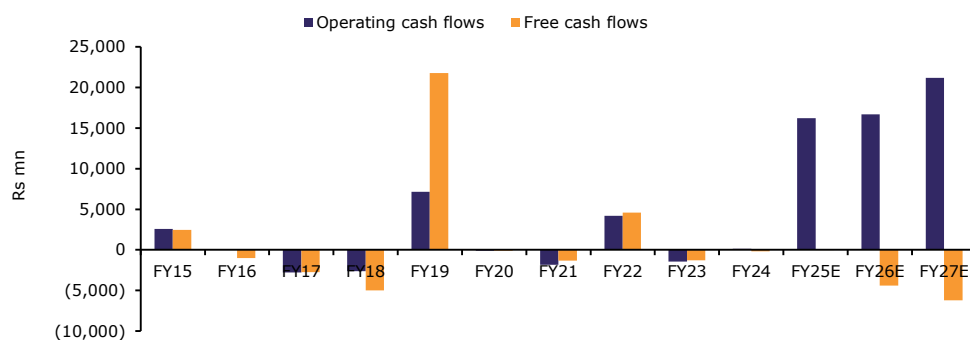
Source: Company, Emkay Research

Balance sheet has deleveraged, paving the way for disciplined scale-up

The company's balance sheet remained highly leveraged during the lull period of 2013-2020. However, with the internal issues being resolved, operational ramp up as well as successful QIP of Rs5bn in FY24, net debt has sharply declined to Rs2.9bn from Rs23.3bn in FY18, leading to a sharp deleverage, and hence improving the balance sheet strength. Further, with improving collections and a calibrated scale up in the residential business, net debt could decline further. This would pave the way for the next leg of sustainable scale up in the residential business as well as ramping up the data center segment, which is a sunrise business for the company.

Exhibit 189: Balance sheet has sharply deleveraged post-demerger
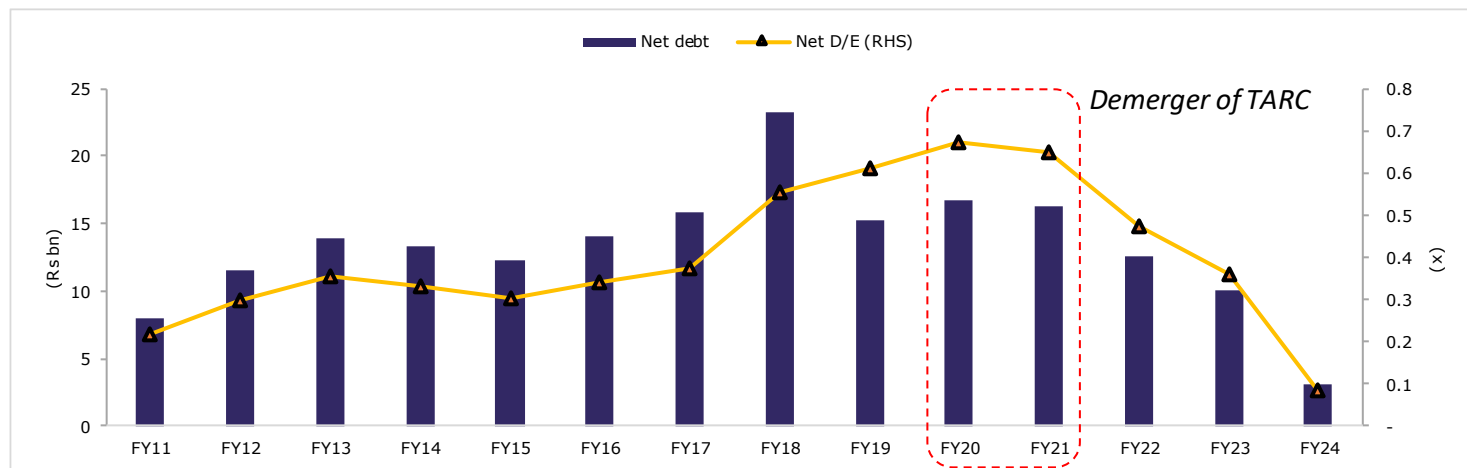
Source: Company, Emkay Research; **Note:** Demerger sanctioned in August 2020, but financials have been restated from FY19. Hence, debt figures appear to be lower post FY18

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Valuations

We value the company on SoTP basis, wherein we take an NAV approach for the residential business, and cap rate for the annuity assets; albeit we value the datacenters business based on DCF methodology. Accordingly, we arrive at a per-share value of Rs925, and initiate coverage on Anant Raj with BUY.

For the residential business, we assume WACC rate of 12.4% for completed projects, 12.9% for Ongoing projects, and 13.4% for Forthcoming projects. Accordingly, we arrive at on EV for the residential segment at Rs63.8bn on FY25 estimates, for ongoing/planned projects. Further, current availability of land bank (101 acres in Delhi, and 20 acres in Sector 63A), scope for further addition, as well as potential tie-ups for JV/JDA projects provide further growth visibility, which is currently not being factored into the NAV. Hence, we assign a 100% premium to the NAV, to capture this potential amid the favorable residential cycle. This implies EV/EBITDA of 7x on FY25 estimates for the residential segment (basis embedded EBITDA at the project level) which is considerably comfortable. There is scope for the company to command an even higher NAV premium, as performance improves/clarity on future development emerges.

In the commercial business, we have projected cash flows on current and under-construction assets up to FY45, and taken 4% terminal growth rate. Further, we have assigned a cap rate of 8.5% on the terminal value. The cash flows have been discounted at 12.4%.

For data centers, we build in EBITDAM in the range of 75-80% across the DC's lifespan (till FY45E), arriving at PATM of ~45-50% over the years. Keeping in mind the high operating cash flows generated, we believe the business will culminate into ~21% IRR (WACC: 12.4%; We/Wd: 80/20), leading to EV/equity of Rs171bn/Rs167bn (EV/EBITDA: 17.7x, Avg EBITDA FY27-28E). Basis our assumptions, we arrive at Rs501/share value from the DC industry.

Accordingly, we arrive at a per share value of Rs925 and initiate coverage on ARL with a BUY recommendation.

Exhibit 190: Anant Raj – Valuations

(Rs mn)	NAV	Comment	Overall value	Per share (Rs)
Residential NAV (on FY25E)	63,816	100% premium on NAV considering the growth visibility	127,632	373
Total residential			**127,632**	**373**
Commercial		4% Terminal growth 8.5% Cap rate	21,461	63
Data Centers				
Total EV - Residential and Commercial (ex data centers)			**149,093**	**436**
EV - Data centers			**171,402**	**501**
Less: Net debt			4,131	12
Equity Value			**316,364**	**925**

Source: Company, Emkay Research

Exhibit 191: Anant Raj - Emkay Estimates

Particulars	FY24	FY25E	FY26E	FY27E	FY24-27E CAGR
	Actual	Introducing	Introducing	Introducing	
Revenue (Rs mn)	14,833	18,981	22,578	29,955	26.4%
EBITDA (Rs mn)	3,338	4,985	7,152	11,658	51.7%
EBITDA Margin	22.5%	26.3%	31.7%	38.9%	1,641bps
PAT (Rs mn)	2,659	3,408	4,099	6,546	35.0%
EPS (Rs)	7.8	10.0	12.0	19.1	35.0%
PER (x)	86.8	67.7	56.3	35.3	

Source: Emkay Research

Risks and Concerns

- **Competition intensity:** While we are bullish on the sector, there are risks to our investment thesis. The main concern is that there is a high possibility of more players entering the data center play, with the advent of private capital chasing after the historically attractive returns.

- **Risk of lower ROICs:** A crowded field of participants in the data center business, especially by real estate players or tech-based companies could create the risk of reducing Return on Invested Capital (ROIC) of the overall sector, in order to gain business from an increasingly sophisticated group of buyers of data center services. For instance, high-end REITs (providing data center/cloud services) in the US market have been witnessing slowdown in their annual revenue growth profiles over the past few years, from the low-to-mid teens growth to now almost a mid-to-high single digit growth.

- **Economic slowdown:** Overall trends toward data center outsourcing are likely to be supported by a strong economic backdrop. IT budgets have generally been on the rise, but this could easily turn in an economic slowdown.

- **Concentrated in Delhi-NCR market:** Apart from one affordable housing project in Tirupati, all the ongoing and planned projects are in the Delhi-NCR market. Also, the future growth plans in the residential segment are pivoted in this region. While the current prospects of the Delhi-NCR residential market look strong in terms of demand and pricing growth, any derailment in the ongoing scenario for a prolonged time can lead to inventory overhang or keep the balance sheet heavy, given the large land bank that the company is carrying on its books.

- **Slowdown in housing demand:** The residential market is showing strong appetite for home ownership, with the Delhi-NCR market being one of the top markets in India. However, any slowdown in this demand can impact growth prospects as well as profitability of ARL as competition might increase, leading to impact on housing sales as well as probable stagnation/decline in housing prices.

- **Increase in construction cost can impact profitability:** In a scenario of high inflation in the cost of construction/building materials, ARL's profitability can get impacted if the cost-increases are not fully passed on.

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Company Overview

Established in 1969, Anant Raj has transitioned over the last 5 decades, from being one of the largest contractors in Delhi to becoming a reputed real estate developer in the NCR market. It has constructed ~30,000 houses for Delhi Development Authority (DDA). The company has a diverse portfolio of projects, including Integrated Residential Townships, Group Housing, IT Parks, Hotels, Commercial Complexes, Malls, Service Apartments, Warehousing, and Data Centers. It has developed >9msf of real estate projects across Residential, Commercial and IT Parks in Delhi and NCR.

It has a deep understanding of the NCR market and has developed relationships with local supply chains, strong customer base, robust execution capabilities and innovative offerings which has led to the company garnering strong brand name in the real estate market. Additionally, ARL has strategically acquired a substantial land bank at low cost with high growth potential in Delhi and NCR, making it ready for the next leg of growth. Further, it has scope to acquire additional land parcels in Gurugram Sector 63A as well as explore joint development opportunities which bodes well for continuity of sales momentum in the coming years.

Exhibit 192: Anant Raj – An overview
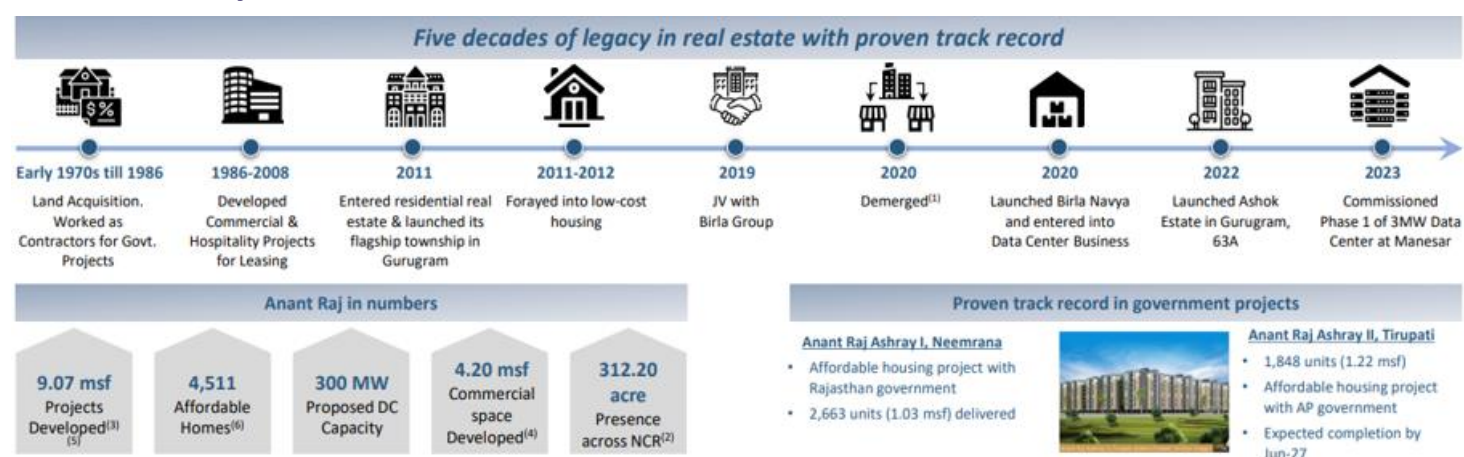
Source: Company, Emkay Research

Exhibit 193: Board of Directors

Name	Designation
Amit Sarin	Managing Director
Aman Sarin	Whole-time Director and CEO
Ashim Sarin	Whole-time Director and COO
Brajindar Mohan Singh	Non-Executive Independent Director
Veerayya Chowdary Kosaraju	Non-Executive Independent Director
Rajesh Tutej	Non-Executive Independent Director
Maneesh Gupta	Non-Executive Independent Director
Kulpreet Sond	Non-Executive Independent Director

Source: Company, Emkay Research

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Anant Raj : Consolidated Financials and Valuations

Profit & Loss

Y/E Mar (Rs mn)	FY23	FY24	FY25E	FY26E	FY27E
Revenue	**9,569**	**14,833**	**18,981**	**22,578**	**29,955**
Revenue growth (%)	107.2	55.0	28.0	19.0	32.7
EBITDA	**1,971**	**3,338**	**4,985**	**7,152**	**11,658**
EBITDA growth (%)	159.7	69.4	49.3	43.5	63.0
Depreciation & Amortization	165	181	548	1,591	2,447
EBIT	**1,806**	**3,157**	**4,437**	**5,561**	**9,211**
EBIT growth (%)	204.9	74.9	40.5	25.3	65.6
Other operating income	0	0	0	0	0
Other income	479	374	393	413	433
Financial expense	318	346	296	512	893
PBT	**1,967**	**3,186**	**4,534**	**5,462**	**8,752**
Extraordinary items	0	0	0	0	0
Taxes	523	540	1,161	1,398	2,240
Minority interest	21	(50)	(15)	(15)	(15)
Income from JV/Associates	46	64	50	50	50
Reported PAT	**1,511**	**2,659**	**3,408**	**4,099**	**6,546**
PAT growth (%)	175.3	76.0	28.2	20.3	59.7
Adjusted PAT	**1,511**	**2,659**	**3,408**	**4,099**	**6,546**
Diluted EPS (Rs)	**4.4**	**7.8**	**10.0**	**12.0**	**19.1**
Diluted EPS growth (%)	175.3	76.0	28.2	20.3	59.7
DPS (Rs)	**0.5**	**0.7**	**0.0**	**0.0**	**0.0**
Dividend payout (%)	**11.3**	**9.4**	**0.0**	**0.0**	**0.0**
EBITDA margin (%)	20.6	22.5	26.3	31.7	38.9
EBIT margin (%)	18.9	21.3	23.4	24.6	30.7
Effective tax rate (%)	26.6	17.0	25.6	25.6	25.6
NOPLAT (pre-IndAS)	**1,325**	**2,622**	**3,301**	**4,137**	**6,853**
Shares outstanding (mn)	341.9	341.9	341.9	341.9	341.9

Source: Company, Emkay Research

Balance Sheet

Y/E Mar (Rs mn)	FY23	FY24	FY25E	FY26E	FY27E
Share capital	648	684	684	684	684
Reserves & Surplus	27,603	35,880	39,288	43,387	49,933
Net worth	**28,251**	**36,564**	**39,972**	**44,071**	**50,617**
Minority interests	332	282	267	252	237
Deferred tax liability (net)	374	512	562	612	662
Total debt	**10,795**	**6,267**	**5,367**	**9,267**	**16,167**
Total liabilities & equity	**39,751**	**43,625**	**46,169**	**54,202**	**67,683**
Net tangible fixed assets	13,053	13,138	19,014	28,431	43,746
Net intangible assets	0	0	0	0	0
Net ROU assets	0	0	0	0	0
Capital WIP	185	215	230	245	260
Goodwill	0	0	0	0	0
Investments [JV/Associates]	4,603	3,018	3,109	3,202	3,298
Cash & equivalents	**691**	**3,212**	**2,268**	**1,563**	**1,651**
Current assets (ex-cash)	25,035	29,099	28,225	30,590	31,013
Current Liab. & Prov.	3,815	5,058	6,677	9,830	12,285
NWC (ex-cash)	**21,220**	**24,042**	**21,548**	**20,761**	**18,728**
Total assets	**39,751**	**43,625**	**46,169**	**54,202**	**67,683**
Net debt	10,104	3,055	3,100	7,704	14,516
Capital employed	39,751	43,625	46,169	54,202	67,683
Invested capital	**34,273**	**37,180**	**40,562**	**49,192**	**62,474**
BVPS (Rs)	82.6	106.9	116.9	128.9	148.0
Net Debt/Equity (x)	0.4	0.1	0.1	0.2	0.3
Net Debt/EBITDA (x)	5.1	0.9	0.6	1.1	1.2
Interest coverage (x)	0.1	0.1	0.1	0.1	0.1
RoCE (%)	6.0	8.5	10.8	11.9	15.8

Source: Company, Emkay Research

Cash flows

Y/E Mar (Rs mn)	FY23	FY24	FY25E	FY26E	FY27E
PBT	1,967	3,186	4,534	5,462	8,752
Others (non-cash items)	0	0	0	0	0
Taxes paid	(523)	(540)	(1,161)	(1,398)	(2,240)
Change in NWC	(2,908)	(2,683)	12,373	10,951	11,777
Operating cash flow	**(1,460)**	**115**	**16,198**	**16,704**	**21,195**
Capital expenditure	173	(296)	(16,218)	(21,086)	(27,422)
Acquisition of business	0	1,584	(91)	(93)	(96)
Interest & dividend income	308	326	296	512	893
Investing cash flow	**652**	**1,663**	**(15,931)**	**(20,782)**	**(27,099)**
Equity raised/(repaid)	58	36	0	0	0
Debt raised/(repaid)	1,113	(4,527)	(900)	3,900	6,900
Payment of lease liabilities	0	0	0	0	0
Interest paid	(318)	(346)	(296)	(512)	(893)
Dividend paid (incl tax)	(171)	(250)	0	0	0
Others	507	5,831	(15)	(15)	(15)
Financing cash flow	**1,190**	**744**	**(1,211)**	**3,373**	**5,992**
Net chg in Cash	382	2,522	(945)	(704)	88
OCF	(1,460)	115	16,198	16,704	21,195
Adj. OCF (w/o NWC chg.)	(4,368)	(2,568)	28,571	27,655	32,972
FCFF	(1,287)	(181)	(21)	(4,382)	(6,227)
FCFE	(1,296)	(201)	(21)	(4,382)	(6,227)
OCF/EBITDA (%)	(74.1)	3.4	324.9	233.6	181.8
FCFE/PAT (%)	(85.8)	(7.6)	(0.6)	(106.9)	(95.1)
FCFF/NOPLAT (%)	**(97.1)**	**(6.9)**	**(0.6)**	**(105.9)**	**(90.9)**

Source: Company, Emkay Research

Valuations and key Ratios

Y/E Mar	FY23	FY24	FY25E	FY26E	FY27E
P/E (x)	152.7	86.8	67.7	56.3	35.3
P/CE(x)	137.7	81.3	58.3	40.6	25.7
P/B (x)	8.2	6.3	5.8	5.2	4.6
EV/Sales (x)	25.2	15.8	12.3	10.6	8.2
EV/EBITDA (x)	122.2	70.0	46.9	33.3	21.0
EV/EBIT(x)	133.4	74.1	52.7	42.9	26.6
EV/IC (x)	7.0	6.3	5.8	4.8	3.9
FCFF yield (%)	(0.5)	(0.1)	0.0	(1.8)	(2.5)
FCFE yield (%)	(0.6)	(0.1)	0.0	(1.9)	(2.7)
Dividend yield (%)	0.1	0.1	0.0	0.0	0.0
DuPont-RoE split					
Net profit margin (%)	15.8	17.9	18.0	18.2	21.9
Total asset turnover (x)	0.3	0.4	0.4	0.4	0.5
Assets/Equity (x)	1.4	1.3	1.2	1.2	1.3
RoE (%)	**5.5**	**8.2**	**8.9**	**9.8**	**13.8**
DuPont-RoIC					
NOPLAT margin (%)	13.9	17.7	17.4	18.3	22.9
IC turnover (x)	0.0	0.0	0.0	0.0	0.0
RoIC (%)	**5.5**	**8.8**	**11.4**	**12.4**	**16.5**
Operating metrics					
Core NWC days	809.4	591.6	414.4	335.6	228.2
Total NWC days	**809.4**	**591.6**	**414.4**	**335.6**	**228.2**
Fixed asset turnover	0.7	1.1	1.1	0.9	0.8
Opex-to-revenue (%)	5.3	4.7	4.0	3.6	3.0

Source: Company, Emkay Research

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Ratings	Expected Return within the next 12-18 months.
BUY	>15% upside
ADD	5-15% upside
REDUCE	5% upside to 15% downside
SELL	<15% downside

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