India: The new frontier for AI GPU clusters

Research

India

2024

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Executive summary

India's data centre industry is experiencing rapid growth, with significant developments in infrastructure and investment. Hyperscalers are actively seeking land in key data center hubs while focusing on data centre facilities with 220 kVA substations for their colocation requirements. Data centre operators are planning to build new campuses targeting 400 kVA lines for developing AI clusters. Navi Mumbai has seen accelerated pre-leasing, with potential demand of 800 MW.

The AI industry is projected to contribute US $957 billion* to India's economy. The government has approved US $1.24 billion in investments for AI infrastructure, including at least 10,000 GPUs. Major players like Reliance Industries are investing in gigawatt-scale AI-ready data centres, while startups are building over 10 Indian language-based large language models to enable interaction in local languages.

The launch of 5G has transformed India's digital landscape. By the end of 2023, it reached over 90% population coverage. 5G users consume 3.6 times more data than 4G users, and 5G's contribution rose to 15% in 2023. India had 119 million 5G subscriptions by the end of 2023 and is expected to reach 840 million by 2029.

The industry is expected to add 604 MW capacity during H2 2024-2026, requiring 7.3 million sq. ft. of real estate and US $3.8 billion in capital outlay. Mumbai is set to retain its lead in the market, with Chennai and other regions witnessing growth. This expansion is driving demand for DC-specific skilled human resources and creating opportunities for backward-linked industries.

*Source: Accenture report - 'Rewire for Growth'

In conclusion, India's data centre industry is poised for substantial growth, driven by AI adoption, 5G expansion, and increasing digital transformation. The sector's rapid development is attracting significant investments, creating job opportunities, and contributing to the country's economic growth. As the industry continues to evolve, it will play a crucial role in shaping India's digital future and position in the global technology landscape.

Rachit Mohan
APAC Lead - Data Centre Leasing and India Lead Data Centre Transactions

Key highlights and trends

India DC industry stood at 917 MW capacity with 873 MW occupancy till first half of 2024.

Increasing pre-commitment rates with every passing year have led to tight market conditions and lowering vacancy during 2021-24.

India data centre industry grew by 2.5 times over last 4 years at 24% CAGR.

India's AI startups are growing fast, attracting capital and increasing the need for advanced data centres across the country.

Large scale commitments towards AI GPU clusters by colo players

India improving power self-sufficiency with 50% energy from green sources provides scope for data centre industry growth.

604 MW capacity addition during H2 2024-2026 would require US$3.8 billion capital investments.

Average capacity build is expected to increase to 200 MW over next few years due to manifold increase in computing and resultant power requirements.

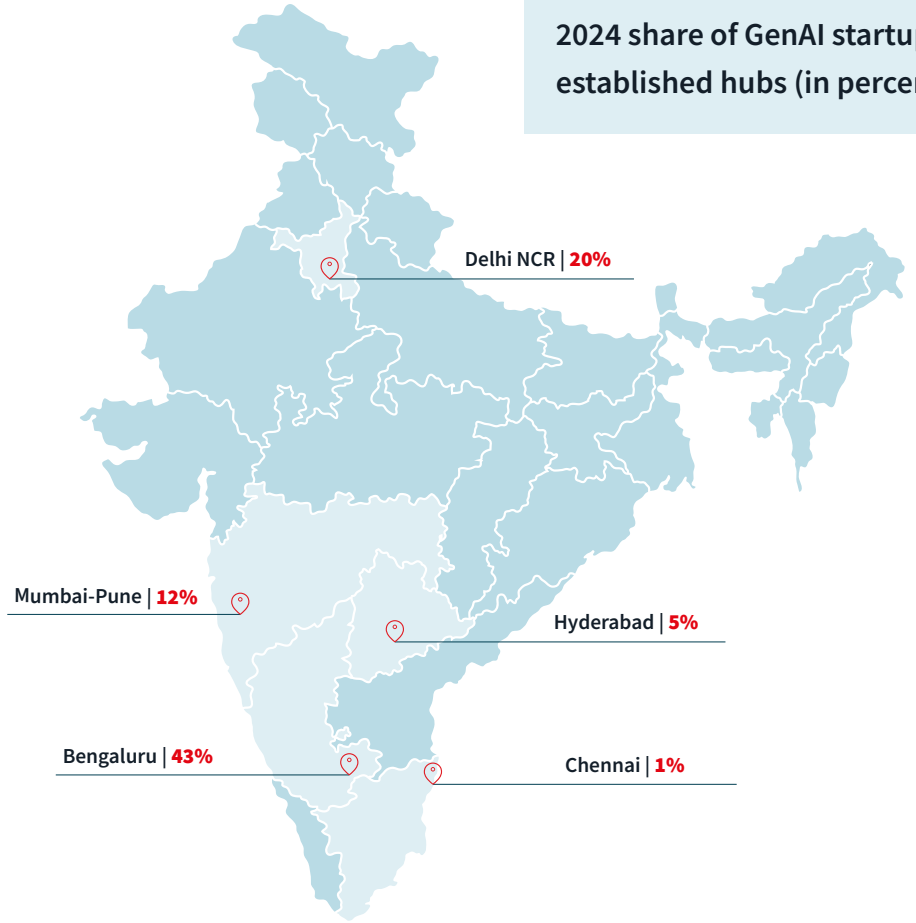
Key trends

Growth of AI ecosystem by hyperscalers and startups to propel demand for DCs

1. Development of local language models and shift of training loads to cost competitive locations in India to increase absorption in Indian data centres with AI ready infrastructure.
2. India's Generative AI (GenAI) gained momentum gradually after the launch of OpenAI-3.6X growth in GenAI startup base, from 66+ in H1 CY2023 to 240+ in H1 CY2024.
3. Investments in GenAI increased by 25% in H1 2024 at $758 mn as compared to $608 mn in H1 2023.
4. Bengaluru leads the startup space with 43% share followed by Delhi at 20%. Increasing training workloads imply increasing demand for AI-enabled data centres in India.

	H1 2023	H1 2024	% change
Cumulative Indian investment in AI	$8.54 billion	$10.59 billion	24%
Cumulative Indian investment in GenAI	~ $608 mn	~ $758 mn	25%
Cumulative number of GenAI startups in India	66+	240+	3.6x

2024 share of GenAI startups in established hubs (in percent)



Note: Rest of India share-19%
Sources: Tracxn, Nasscom analysis

Accelerating AI innovation: India's emerging GPU ecosystem

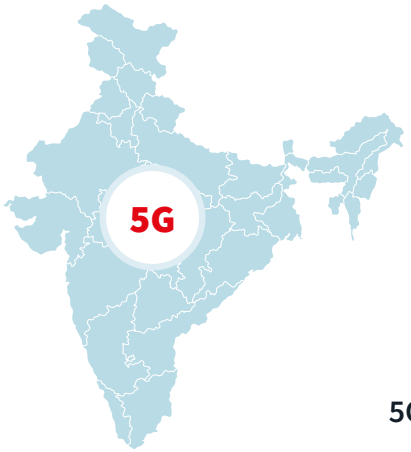
India's fast-expanding Artificial Intelligence (AI) industry is expected to contribute US$957 billion to the national economy, according to a research report published by Accenture. India is rapidly positioning itself as a global hub for AI innovation and development.

1. The Indian Government has approved a US$1.24 billion investment to build AI infrastructure which will have at least 10,000 GPUs.
2. Reliance Industries announced plans for gigawatt-scale AI-ready data centres in Jamnagar, to create the lowest AI inferencing cost in India to make AI applications more affordable and accessible nationwide.
3. Nvidia is providing AI chips to various firms like Reliance Industries, Yotta Data Services, and Tata Communications. Nvidia also announced Nemotron-4-Mini-Hindi 4B — a small language model in Hindi.
4. Indian enterprises are developing 10 Indian language-based large language models to enable Indians to interact in local languages.
5. Nvidia is also collaborating with other major Indian IT companies like Infosys, Wipro and TCS to train around 500,000 developers in creating and implementing AI agents with its software.
6. AI cloud provider Neysa raises $30 million in Series A funding, led by NTTVC, Z47, and Nexus Venture Partners. The company focuses on delivering tailored AI solutions for emerging markets like India.

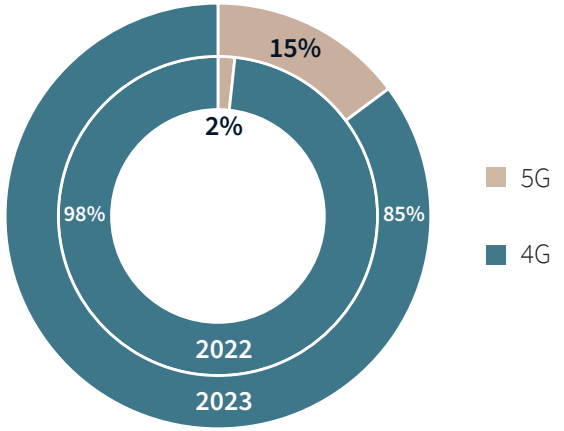
5G to drive next level of data consumption in India with 840 mn subscribers by 2029

1. The launch of 5G in India has transformed the digital landscape of the country with a significant shift in data consumption while ushering in a new era of connectivity.
2. India has made large-scale mid-band deployments, reaching over 90 percent population coverage by the end of 2023.
3. 5G users on average consume 3.6x more data compared to 4G users.
4. 5G contribution reached near 15% in 2023 (vs. 1.7% in 2022).
5. 5G subscriptions in India reached around 119 million by the end of 2023. 5G subscriptions are expected to reach around 840 million by the end of 2029, accounting for 65 percent of mobile subscriptions in the region.
6. 5G technology will enable usage of data-intensive activities like HD video streaming, online gaming, cloud computing, and augmented reality applications.

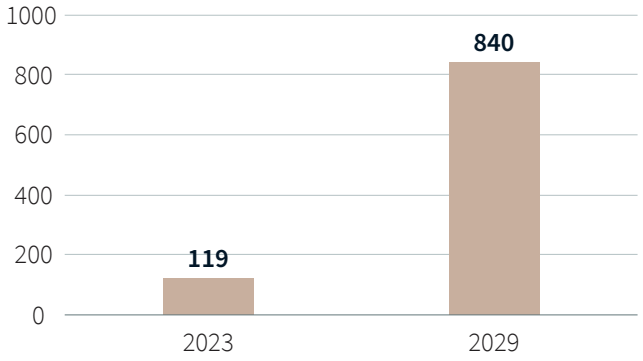
5G is available in every State / UT of the country



4G and 5G traffic contribution (%)



5G subscriber growth forecast



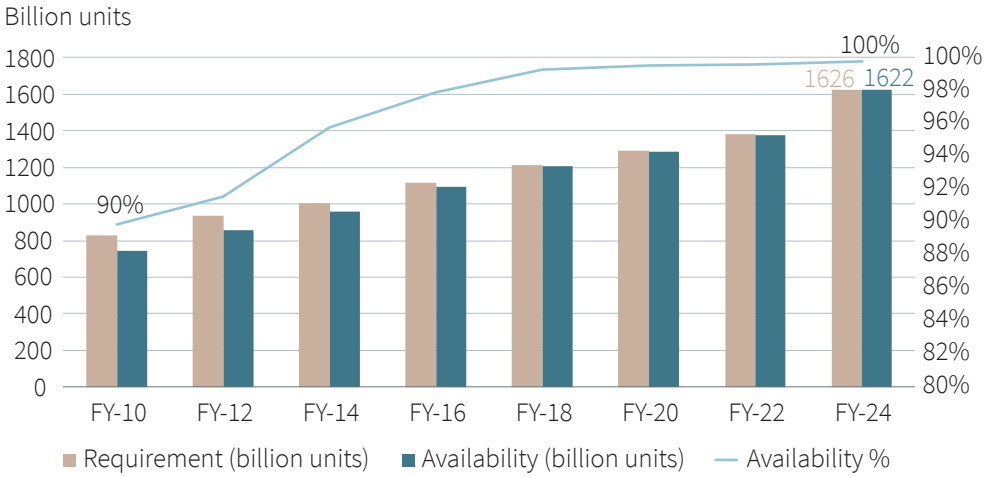
Source: Ericsson Mobility Report

India a power surplus nation; aiming for renewable energy share at 50% by 2030

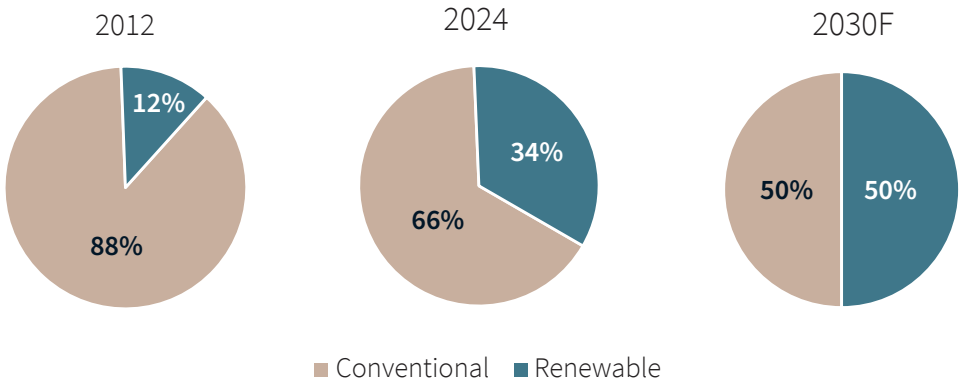
1. India has made significant strides in electricity generation with increasing focus on renewable sources of energy.
2. Total installed capacity increased ~2.4 times from 173.62 GW in March 2011 to 414.79 GW in March 2024.
3. Transmission line capacity increased from 258,948 circuit kilometers in 2011 to 4,72,229 circuit kilometers in 2023.
4. India plans to add 500 gigawatts (GW) of renewable energy capacity by 2030.

Source: Central Electricity Authority, Ministry of Power & Ministry of New and Renewable Energy

India's energy requirement and availability trend

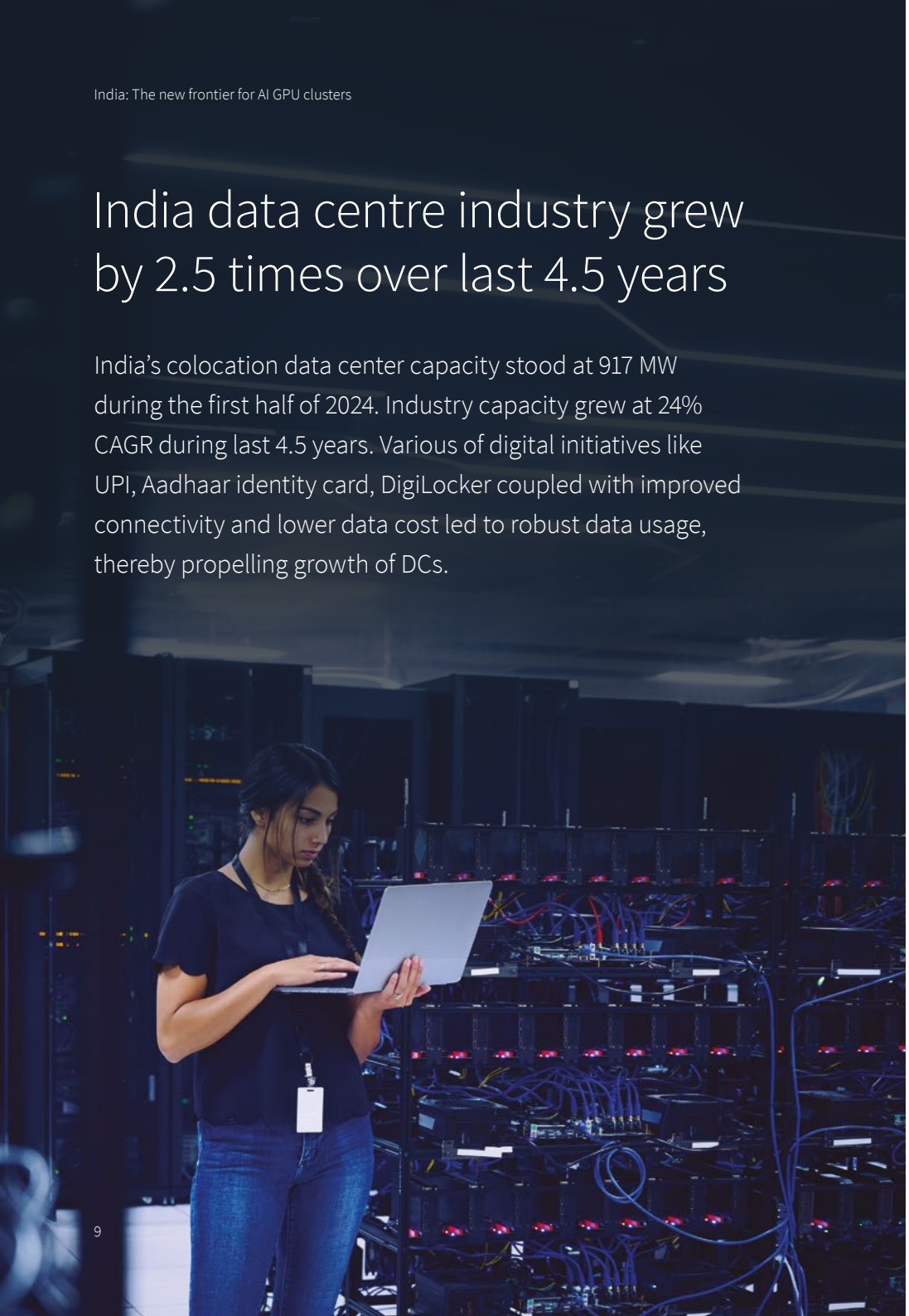


India renewable energy capacity shift

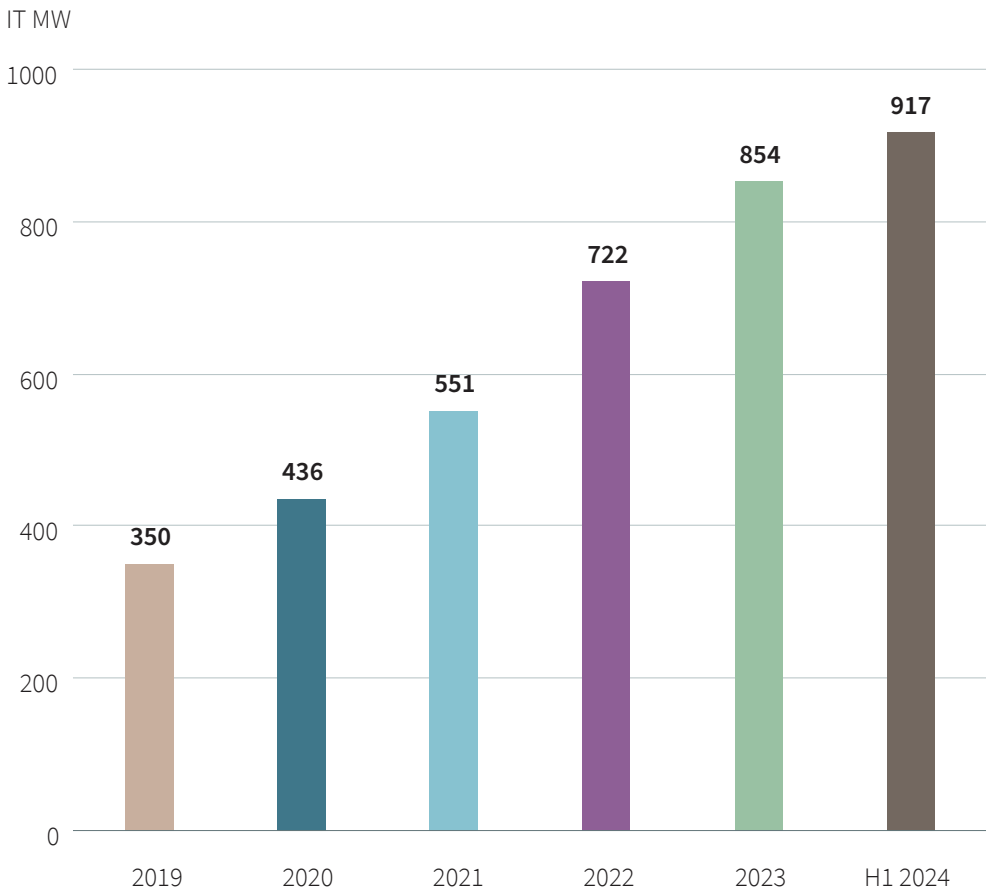


India data centre industry grew by 2.5 times over last 4.5 years

India's colocation data center capacity stood at 917 MW during the first half of 2024. Industry capacity grew at 24% CAGR during last 4.5 years. Various of digital initiatives like UPI, Aadhaar identity card, DigiLocker coupled with improved connectivity and lower data cost led to robust data usage, thereby propelling growth of DCs.



India colocation market growth since 2020



Average construction pace of >100 MW annually to >200 MW in next few years

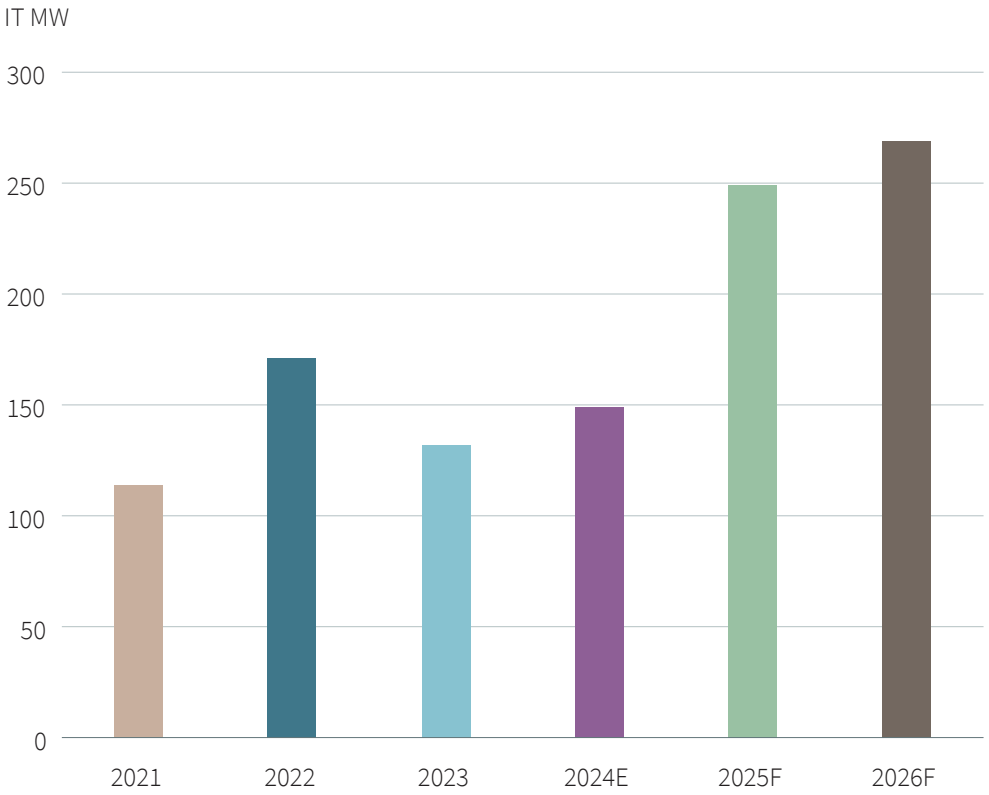
Colocation capacity under construction has been growing in leaps and bounds with an average of 140 MW in last three years. This pace has been driven by strong pre-commitment pipelines and ever-expanding availability zone requirements of CSPs. Average capacity build is expected to increase to 222 MW over next few years due to manifold increase in computing and resultant power requirements.

Mumbai and Chennai with assured power supply, excellent network connectivity are expected to lead the construction pace. Power approvals would be key determinant for colocation operators to win more pre-commitments from CSPs.

The quest for assured power for DCs that would house AI-based application development (training work loads) could lead to new locations being explored. Some of these would in extended suburbs of key DC hubs while some new regions would qualify for large scale DCs.

The demand for skilled resources required for construction of DCs has been falling short of requirements and could constrain the execution pace.

India colocation capacity under construction (MW)

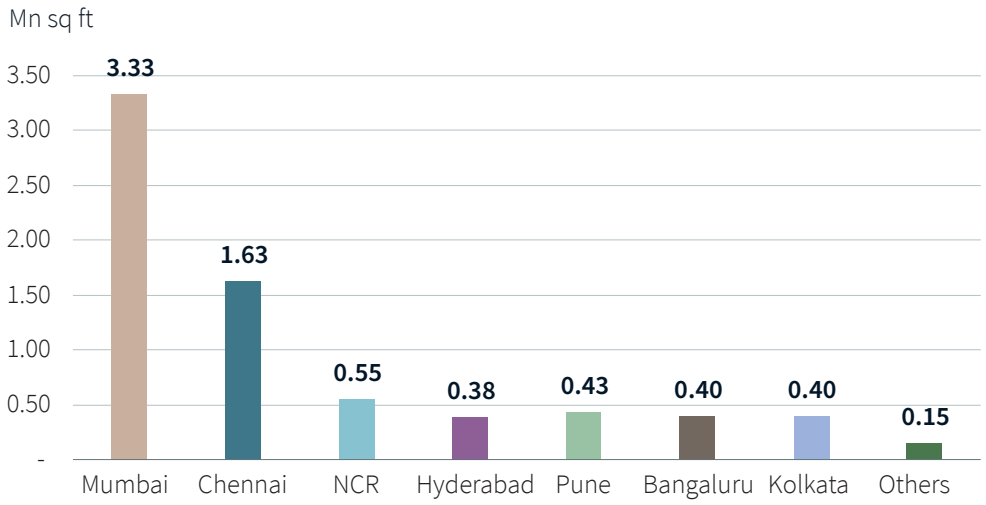


Source: JLL Research

USD 3.8 billion investments expected in DC industry by 2026

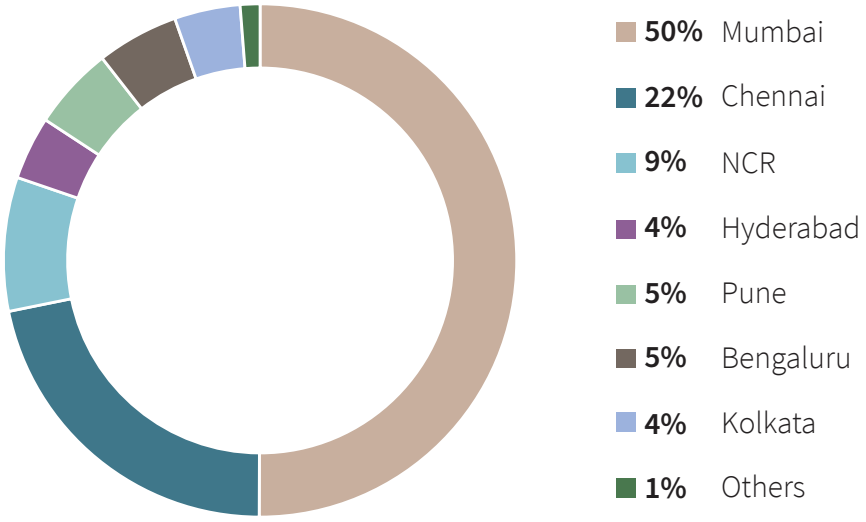
1. 604 MW capacity addition during H2 2024-2026 would be skewed towards mature markets as changes in design and infrastructure would require stable work environments
2. 7.3 million-square-feet real estate requirement would spur high demand for DC specific skilled human resources
3. New capacity additions would require US$3.8 billion capital outlay thereby providing opportunity for backward linked industries
4. Mumbai would retain the lead as new AI based requirements would prefer stable regions while Chennai and other regions would witness growth of new availability zones

Mumbai to account for 46% share of real estate construction



Source: JLL Research

USD 3.8 billion capex expected during H2 2024-2026

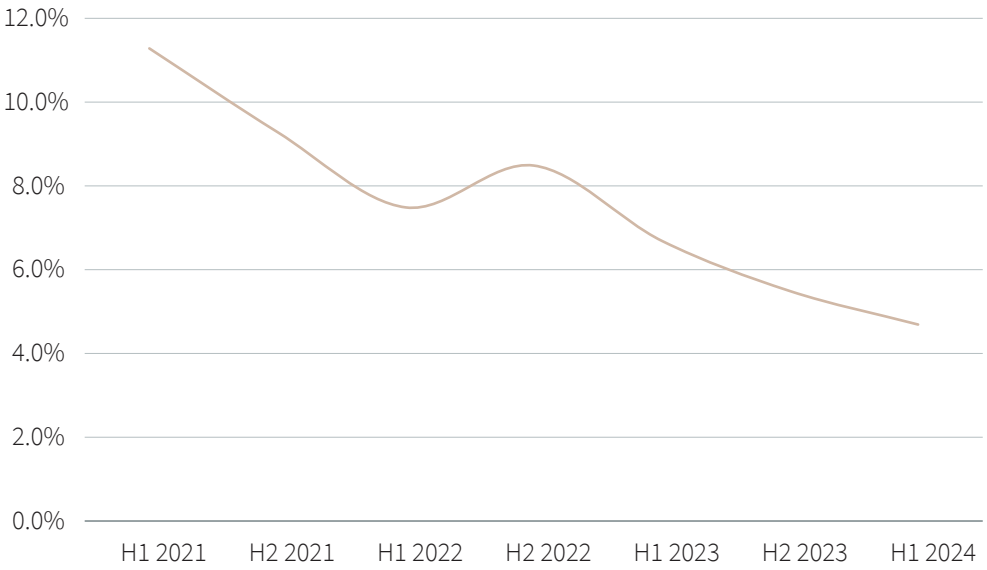


Source: JLL Research

Note: Investments include real estate and DC IT Infrastructure

Tight vacancy levels due to high pre-commitments

Increasing pre-commitment rates with every passing year has led to tight market conditions and declining vacancy trend during 2021-2024. Steady enterprise demand from BFSI , technology and media aided healthy absorption of ready to move DC facilities and have further aided trend of lowering vacancy levels.

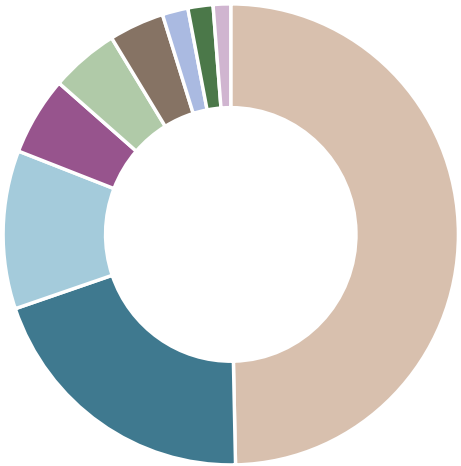


2024 Review


DLR 443.8 908,112.13 +12.33%
INDU 435.1 -602.12 +3.56%
INDP 426.8 25,388.19 +12.33%
-11.6%
-23.8%
+2.54%
-17.9%
30%
88%
59%
53%
42%
30%
56%
20%

Industry witnesses higher supply as a precursor to rising demand driven by AI and 5G

User demand



- **50%** Hyperscale
- **20%** BFSI
- **11%** Technology
- **6%** Telecome
- **5%** Retail & E-commerce
- **4%** Other
- **2%** Entertainment & Media
- **2%** Healthcare
- **1%** Energy

H1 2024 industry size

IT load live
917 MW

IT load occupied
873 MW

H1 2024 India - colocation statistics	
Inventory	**917 MW**
Vacancy	4.7 %
H1 '24 absorption	66 MW
H1 '24 supply	63 MW
Under construction (H2 2024-2026)	604 MW
Planned (2027-2028)	406 MW

Average rents per Kva per month	INR
<250 kW (all in)	9,750
250 kW-1 MW	8,500
1-5 MW	7,500
5-20 MW	7,000

Note: Rates quoted are for Mumbai DC region which accounts for 50% of the India's DC capacity

H1 2024 - 11% increase in supply at 63 MW; marginal rise in demand at 66 MW during H1 2024

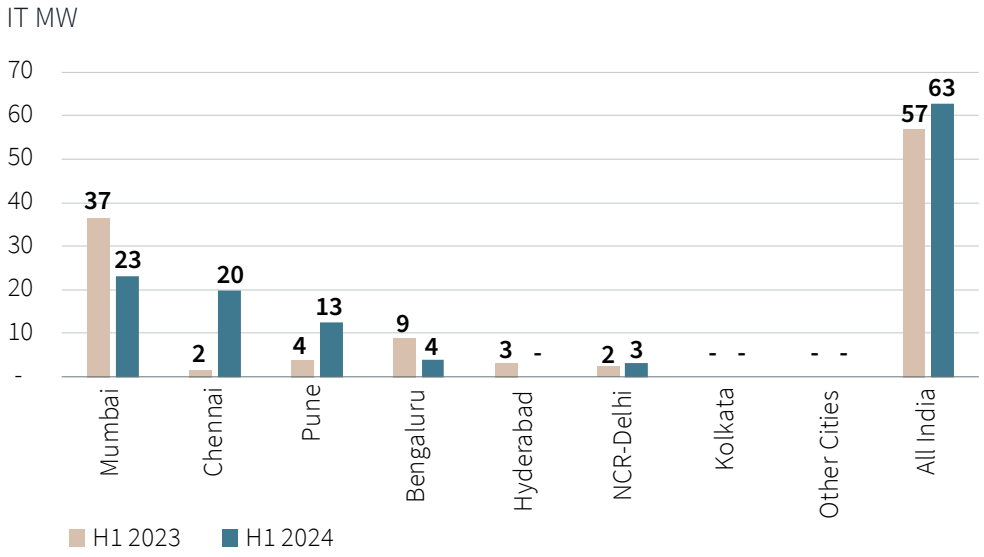
Increase in supply led by pre-commitment deliveries

- Delivery of pre-commitments of CSPs led to increased supply. However, vacancy levels remained tight as existing stock was used for enterprise demand.
- Mumbai continued to account for 37% of total supply during H1 2024.

Steady absorption momentum at 66 MW

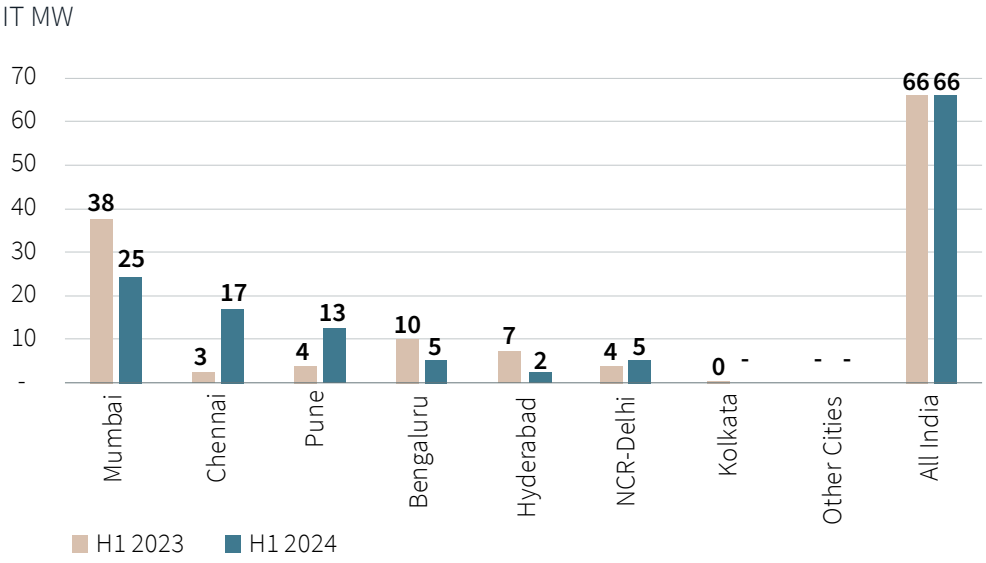
- Staggered offtake by CSPs led to marginal rise in absorption during the first six months of 2024.
- Chennai witnessed higher absorption as ready to occupy facility was occupied by the hyperscalers.

11% y-o-y increase in supply during H1 2024 at 63 MW



Source: JLL Research

Marginal increase in absorption at 66 MW during H1 2024



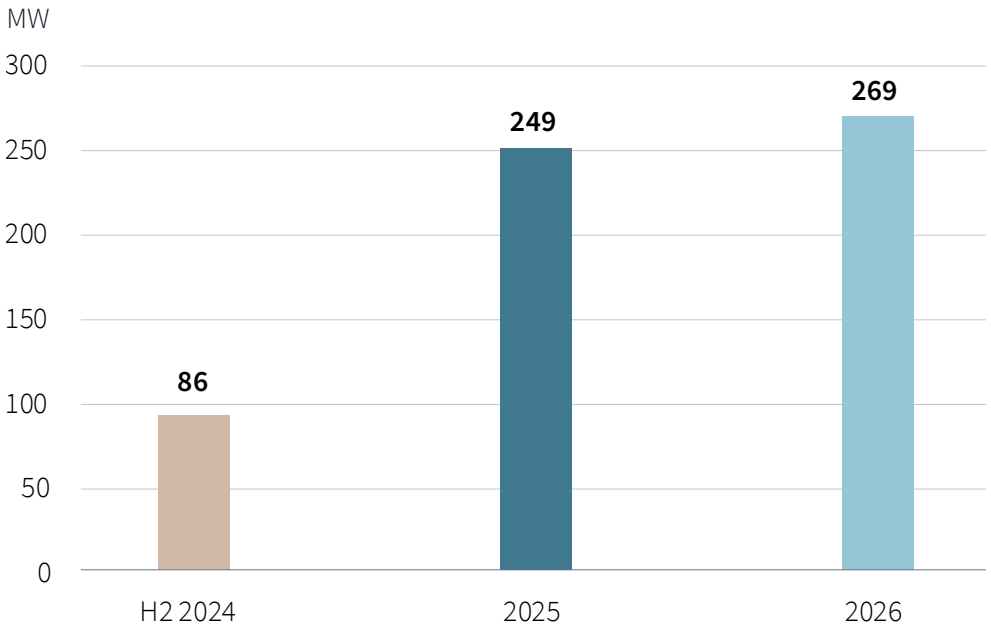
Source: JLL Research

DC Industry capacity expected to be 1.5 GW by end of 2026

Industry capacity to grow by 66% to **1,521 MW** by 2026

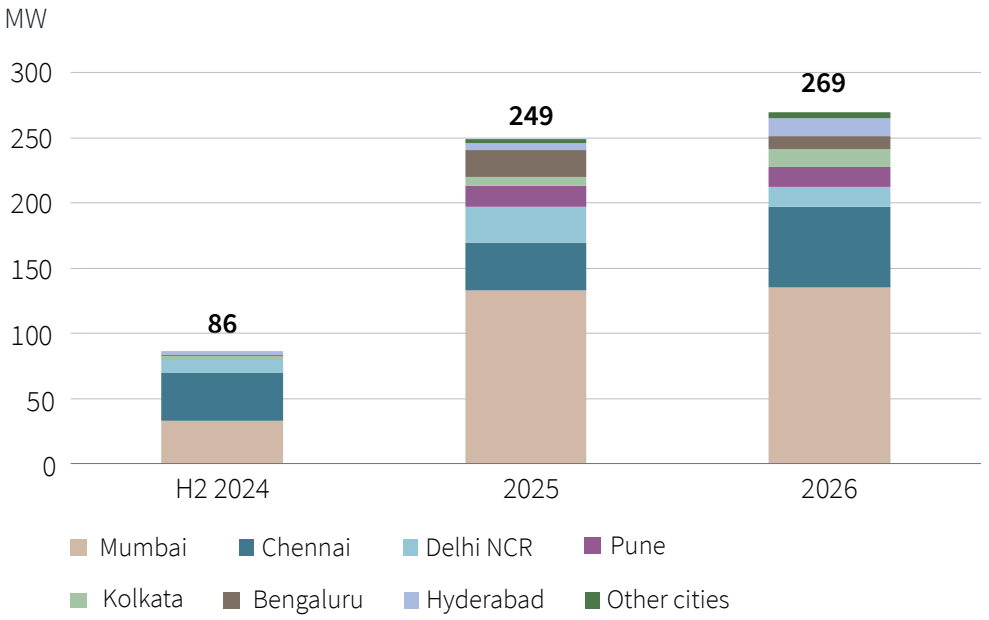
73 mn sq. ft. real estate demand construction estimated for 604 MW capacity addition

Robust digital growth to drive DC capacity expansion



Source: JLL Research

Mumbai and Chennai to account for 81% of new capacity additions



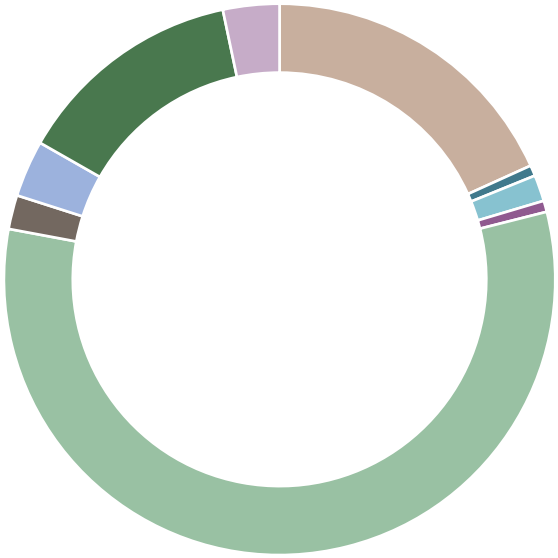
Source: JLL Research

City-wise trends

Mumbai

Colo capacity	Total assets	Cable landing
477 MW	**32**	**9**

User demand share in %



15%	BFSI
1%	Energy
2%	Entertainment & Media
2%	Healthcare
61%	Hyperscale
3%	Other
5%	Retail & E-commerce
7%	Technology
4%	Telecom

Source: JLL Research

Market overview

Supply

- Supply addition of 23.2 MW was in line with pre-committed deliveries
- Shortage of skilled resources during project commissioning stage has been reported

Demand

- Steady cloud demand in reflected in 24.8 MW absorption during H1 2024
- Aggressive pre-commitment discussion by CSPs is expected to keep demand buoyant

Market trends

- Princeton Digital Group announced 500 MW capacity expansion in key markets across Asia, which includes their Mumbai data centre campus
- The Maharashtra state has amended its data centre policy to provide additional incentives for green integrated data centres

Supply	mn s.f.	MW
Total inventory	7.8	477
Total vacant	0.2	15
Under construction (H2 2024-26)	4.9	302
Planned (2027-28)	1.9	119

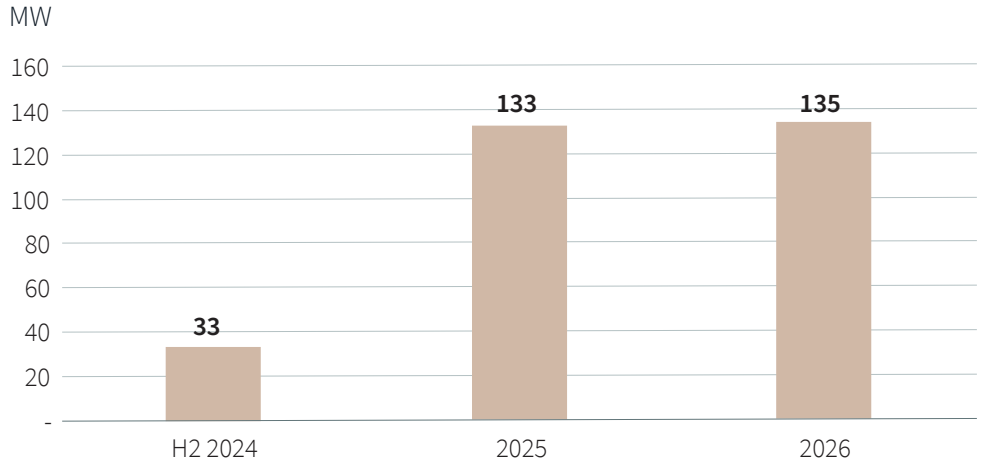
Demand	MW
Net absorption (H1 2024)	24.8

Monthly recurring charges	Low	High
Sub 250 kw	8,250	11,250
250 kw-1 MW	7,500	9,375
1-5 MW	6,750	7,875
5 MW plus	6,375	7,500

Note: The above-mentioned numbers are based on INR/ KW/Month basis available market data on likely achievable rates. The above pricing assumes standard racks between 5kVA-6.5kVA without any customization.

Source: JLL Research

Supply forecast



Note: Supply forecast does not include hyperscale self-build supply

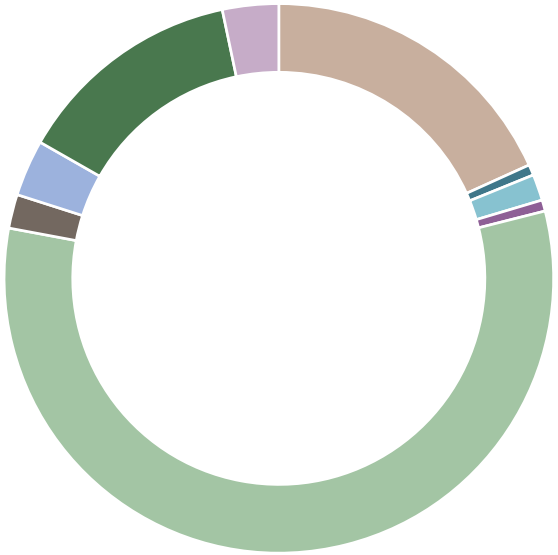
Chennai

Colo capacity
108 MW

Total assets
11

Cable landing
6

User demand share in %



- **18%** BFSI
- **1%** Energy
- **2%** Entertainment & Media
- **1%** Healthcare
- **57%** Hyperscale
- **2%** Other
- **3%** Retail & E-commerce
- **13%** Technology
- **3%** Telecom

Source: JLL Research

Market overview

Supply

- The city added 19.9 MW of non-committed supply which was taken up by CSP
- The city has availability of ready to move capacity by existing as well new entrants during H1 2024

Demand

- City witnessed 16.7 MW absorption primarily due to CSP demand
- BFSI occupiers have increased their commitments during H1 2024

Market trends

- AI demand is expected to gain pace as the new facilities are reported to be compatible with new infrastructure requirements
- Princeton Digital Group has announced plans to add DC capacity in Chennai as part of their expansion strategy

Supply	mn s.f.	MW
Total inventory	2.1	108
Total vacant	0.2	7.8
Under construction (H2 2024-26)	2.6	134
Planned (2027-28)	2.5	130

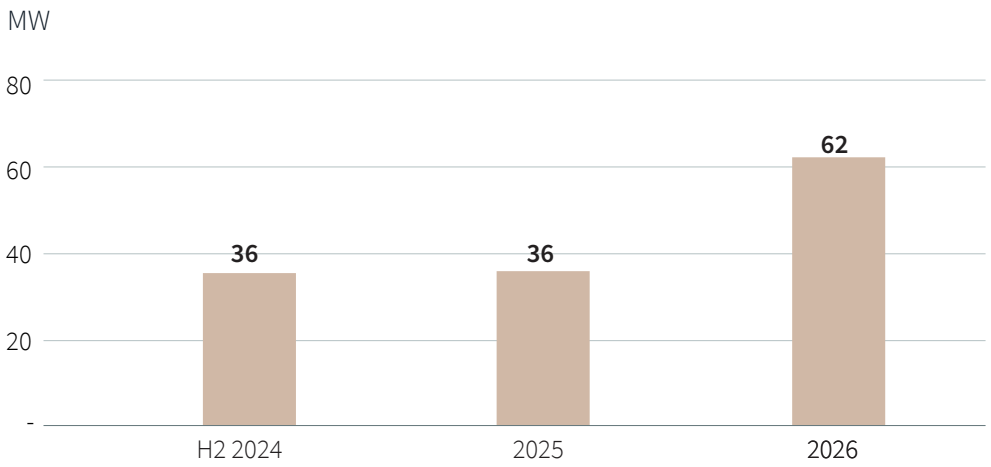
Demand	MW
Net absorption (H1 2024)	16.7

Monthly recurring charges	Low	High
Sub 250 kw	8,250	9,000
250 kw-1 MW	7,875	8,625
1-5 MW	7,125	7,875
5 MW plus	6,375	6,750

Note: The above mentioned numbers are based on INR/ KW/Month basis available market data on likely achievable rates. The above pricing assumes standard racks between 5kVA-6.5kVA without any customization.

Source: JLL Research

Supply forecast



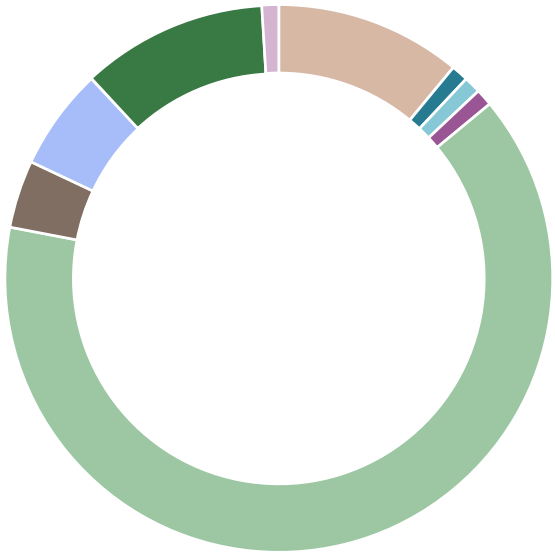
Pune

Colo capacity
94 MW

Total assets
7

Cable landing
Nil

User demand share in %



- **11%** BFSI
- **1%** Energy
- **1%** Entertainment & Media
- **1%** Healthcare
- **64%** Hyperscale
- **4%** Other
- **6%** Retail & E-commerce
- **11%** Technology
- **1%** Telecom

Source: JLL Research

Market overview

Supply

- Pre-committed deliveries led to 12.5 MW supply addition during H1 2024
- On-prem high performance computing DC facility has been established by an Engineering and product design software firm highlighting enterprise demand
- CSP player is reported to have acquired land for self-build capacity

Demand

- Continuous demand from a CSP led to strong demand during H1 2024
- Engineering and IT firms are expected to result in enterprise demand for colo players

Market trends

- Self-build facilities by CSPs are expected to be added in next few years
- City is likely to witness demand from AI applications-based technology firms

Supply	mn s.f.	MW
Total inventory	1.3	94
Total vacant	0.01	0.8
Under construction (H2 2024-26)	0.3	21
Planned (2027-28)	0.7	48

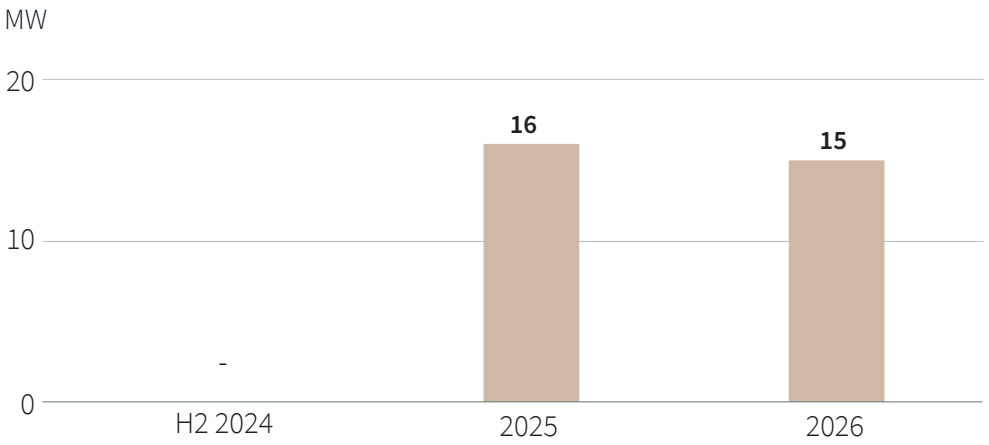
Demand	MW
Net absorption (H1 2024)	12.5

Monthly recurring charges	Low	High
Sub 250 kw	7,125	8,250
250 kw-1 MW	6,600	7,875
1-5 MW	6,375	7,125
5 MW plus	6,000	6,375

Note: The above mentioned numbers are based on INR/ KW/Month basis available market data on likely achievable rates. The above pricing assumes standard racks between 5kVA-6.5kVA without any customization.

Source: JLL Research

Supply forecast



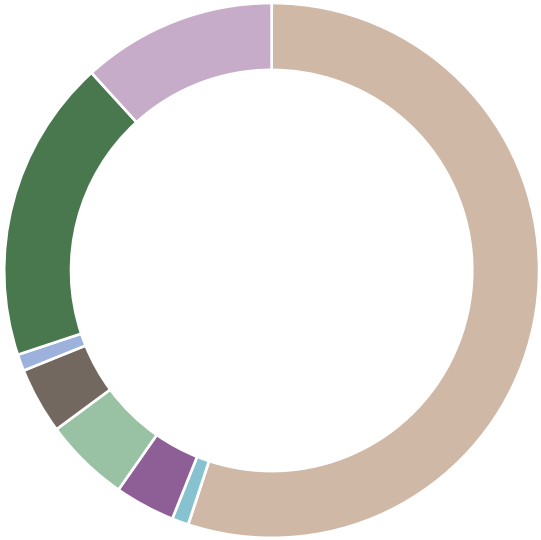
Hyderabad

Colo capacity
52 MW

Total assets
5

Cable landing
Nil

User demand share in %



- **55%** BFSI
- **0%** Energy
- **1%** Entertainment & Media
- **4%** Healthcare
- **5%** Hyperscale
- **4%** Other
- **1%** Retail & E-commerce
- **18%** Technology
- **12%** Telecom

Source: JLL Research

Market overview

Supply

- No new supply has been added during H1 2024; Under construction facilities are expected to be operational during second half of 2024
- CSP providers are adoption built-own-transfer model for self-build facilities

Demand

- 1.9 MW absorption during H1 2024 was mainly from BFSI and CSPs
- Hyperscale pre-commitments may be driven by AI led low latency training loads

Market trends

- Self-build facilities by CSPs are scaling up operations; however, adequate power availability and skilled manpower could pose challenges for growth

Supply	mn s.f.	MW
Total inventory	1.0	51.8
Total vacant	0.02	1.2
Under construction (H2 2024-26)	0.4	23
Planned (2027-28)	0.4	20

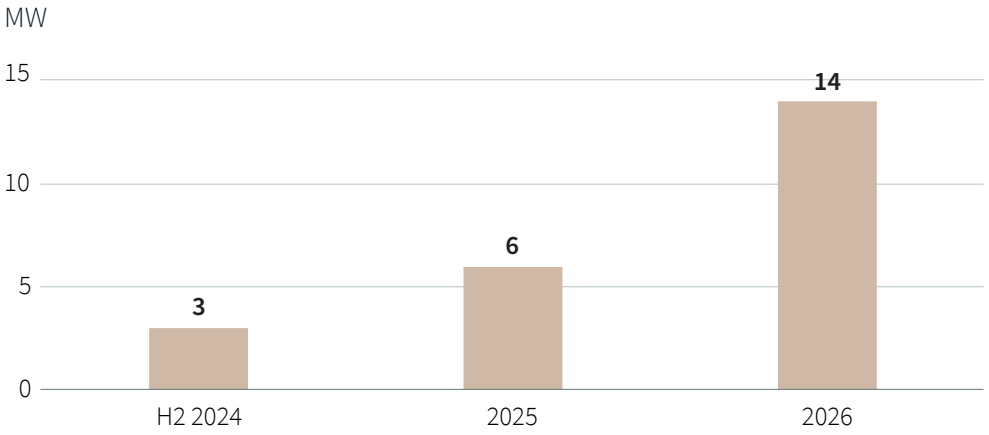
Demand	MW
Net absorption (H1 2024)	1.9

Monthly recurring charges	Low	High
Sub 250 kw	7,875	9,375
250 kw-1 MW	7,350	8,250
1-5 MW	6,600	7,500
5 MW plus	6,375	7,125

Note: The above-mentioned numbers are based on INR/ KW/Month basis available market data on likely achievable rates. The above pricing assumes standard racks between 5kVA-6.5kVA without any customization.

Source: JLL Research

Supply forecast



Note: Supply forecast does not include hyperscale self-build supply

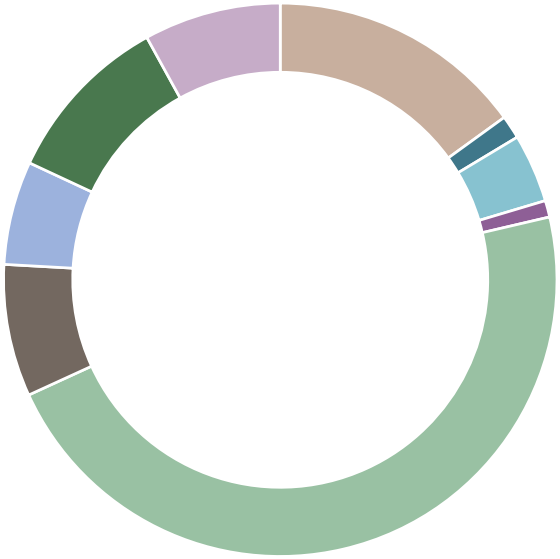
Delhi NCR

Colo capacity
87 MW

Total assets
14

Cable landing
Nil

User demand share in %



- **15%** BFSI
- **1%** Energy
- **4%** Entertainment & Media
- **1%** Healthcare
- **47%** Hyperscale
- **8%** Other
- **6%** Retail & E-commerce
- **10%** Technology
- **8%** Telecom

Source: JLL Research

Market overview

Supply

- Supply of 3.2 MW during H1 2024 was added to meet CSP demand, while existing capacity was used to meet enterprise requirement
- Part of the upcoming supply has been pre-committed and will be live in H2 2024

Demand

- Delhi NCR witnessed 5.4 MW absorption during H1 2024 as against 3.8 MW during same period last year
- Central governments AI mission and digital initiatives are expected to drive next wave of demand in the Delhi NCR region

Market trends

- Existing and new entrants have acquired land for attracting CSPs. However, increase in cloud usage is likely to drive demand growth ahead

Supply	mn s.f.	MW
Total inventory	1.9	86.9
Total vacant	0.2	8.6
Under construction (H2 2024-26)	1.1	53.0
Planned (2027-28)	1.1	51.5

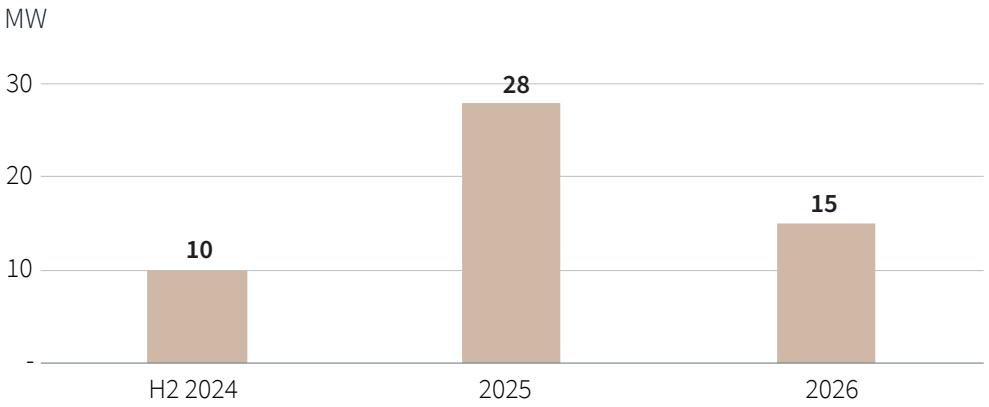
Demand	MW
Net absorption (H1 2024)	5.4

Monthly recurring charges	Low	High
Sub 250 kw	7,875	9,375
250 kw-1 MW	7,350	8,250
1-5 MW	6,600	7,500
5 MW plus	6,375	7,125

Note: The above mentioned numbers are based on INR/ KW/Month basis available market data on likely achievable rates. The above pricing assumes standard racks between 5kVA-6.5kVA without any customization.

Source: JLL Research

Supply forecast



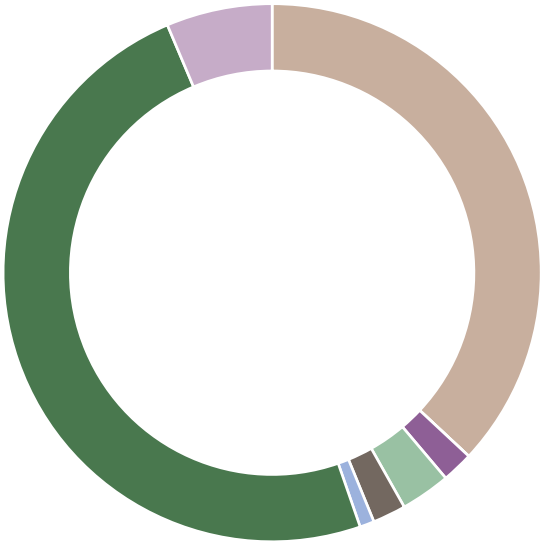
Bengaluru

Colo capacity
81 MW

Total assets
13

Cable landing
Nil

User demand share in %



37%	BFSI
0%	Energy
0%	Entertainment & Media
2%	Healthcare
3%	Hyperscale
2%	Other
1%	Retail & E-commerce
49%	Technology
6%	Telecom

Source: JLL Research

Market overview

Supply

- Brownfield capacity addition of 4MW was added during H1 2024
- Capacity addition has been constrained in Whitefield and Electronic city area due to lack of suitable land parcels

Demand

- Technology firms and BFSI clients occupied 5.1 MW in first six months of 2024
- IT testing labs and core tech firms are exploring Colo facilities for their expansion

Market trends

- Global capability centres of large technology firms based out of the city are expected to drive migration from on-prem to colocation
- Key Indian technology players are planning to foray into cloud-based services which will create new demand for DCs

Supply	mn s.f.	MW
Total inventory	1.9	81
Total vacant	0.1	2
Under construction (H2 2024-26)	0.7	31
Planned (2027-28)	0.4	18

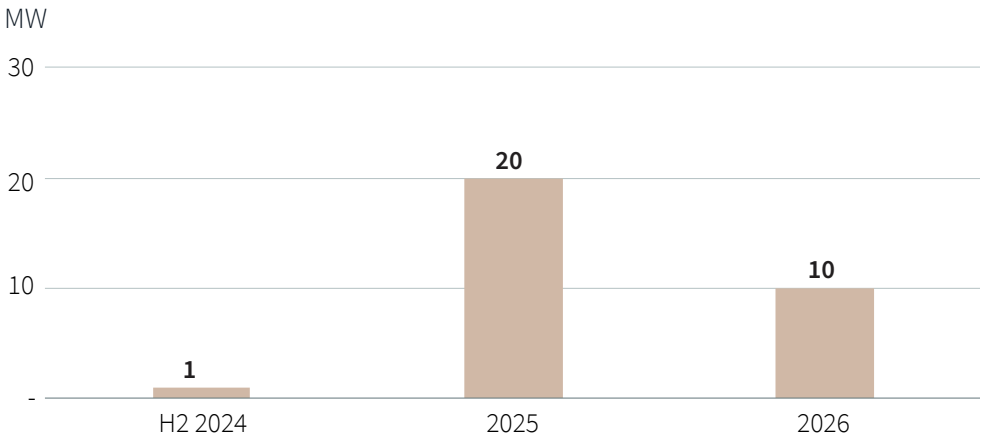
Demand	MW
Net absorption (H1 2024)	5.1

Monthly recurring charges	Low	High
Sub 250 kw	7,500	9,000
250 kw-1 MW	7,350	8,625
1-5 MW	7,125	7,875
5 MW plus	6,525	6,750

Note: The above mentioned numbers are based on INR/KW/Month basis available market data on likely achievable rates. The above pricing assumes standard racks between 5kVA-6.5kVA without any customization.

Source: JLL Research

Supply forecast



Kolkata

Colo capacity
6 MW

Total assets
2

Cable landing
Nil

Market overview

Supply

- Capacity addition in Kolkata is expected to be operational during second half of 2024 as most players have commenced construction in last few quarters

Demand

- Demand from enterprise segment has been intermittent
- The upcoming capacities along with reduced latency due to upcoming subsea cable connectivity is expected to spur demand from CSPs and BFSI segments

Market trends

- The state government recently announced that undersea cable landing station will be operational in Digha in Purba Medinipur district in the first quarter of 2026 which is expected to make Kolkata a leading DC hub in medium term

Supply	mn s.f.	MW
Total inventory	1.9	6
Total vacant	0.030	0.1
Under construction (H2 2024-26)	8.1	24
Planned (2027-28)	6.73	20

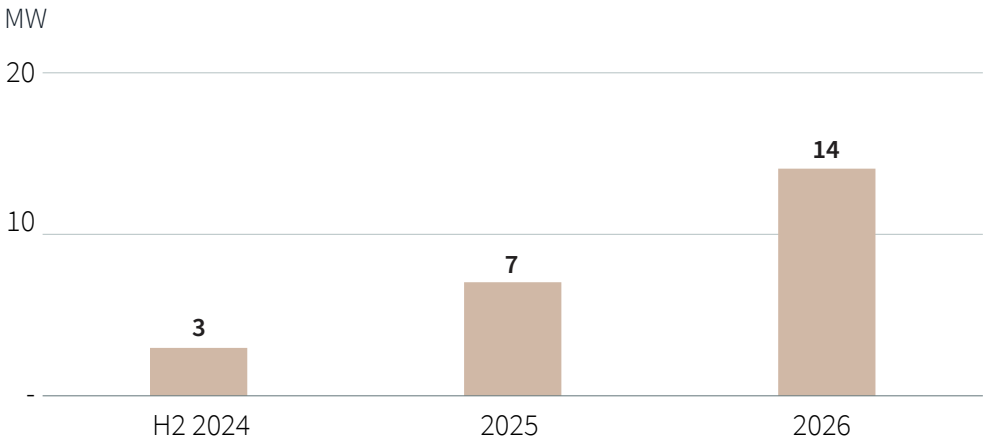
Demand	MW
Net absorption (H1 2024)	Nil

Monthly recurring charges	Low	High
Sub 250 kw	8,250	9,750
250 kw-1 MW	7,500	8,250

Note: The above mentioned numbers are based on INR/KW/Month basis available market data on likely achievable rates. The above pricing assumes standard racks between 5kVA-6.5kVA without any customization.

Source: JLL Research

Supply forecast

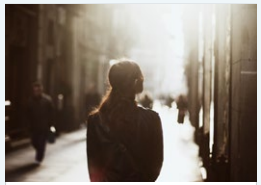


JLL Thought Leadership Compendium

Guides

GCC Guide

Office Relocation Guide

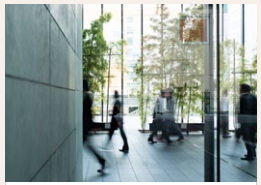


A startup's guide to office space

Construction Cost Guide, India: 2024

Make in India 2.0

Sustainability



India Green Leasing

Responsible Real Estate: Social Value

Office

Office Market Update: Q1 2024

Logistics & Industrial

Country snapshot: India

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Business enquiries

Rachit Mohan
APAC Lead - Data Centre Leasing and India Lead Data Centre Transactions, India
rachit.mohan@jll.com

Benjamin Isaac
Senior Director - Land Data Centre Advisory, India
benjamin.isaac@jll.com

Azizbeg Mirza
Senior Director, PDS Projects, Work Dynamics
azizbeg.mirza@jll.com

Vishal Gupta
Head - FM Sales, West Asia, Work Dynamic
vishal.gupta@jll.com

Author

Jitesh Karlekar
Director Research Data Centre (APAC), India
jitesh.karlekar@jll.com

Research enquiries

Dr. Samantak Das
Chief Economist and Head Research & REIS, India
samantak.das@jll.com

Glen Duncan
Data Centre Research Director, Asia Pacific Research
glen.duncan@jll.com

For other business enquiries, please write to **marketing.india@jll.com**