

DISCUSSION PAPER

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Living Next to the Cloud:

An Evidence-Based Approach to
Data Centres in Residential India





About Policy Consensus Centre (PCC)

The Policy Consensus Centre (PCC), founded by Ms. Nirupama Soundararajan and Mr. Arindam Goswami, emerges with a distinct mission: to conduct impactful policy research and drive policy transformations. Our focus encompasses pivotal sectors crucial for India's advancement, along with those that have been underexplored. In the intricate landscape of India, divergent opinions often hinder consensus-building for policymakers amidst diverse stakeholders.

PCC stands dedicated to comprehensive, evidence-driven research, promoting inclusivity and rigor. Our objective resides in cultivating accord among stakeholders through independent, data-centric analysis, a catalyst for meaningful policy shifts. In a climate where some research entities avoid unconventional subjects, PCC remains resolute in advocating thorough exploration across all sectors. Our belief underscores the necessity to scrutinize seemingly unconventional domains, an approach vital for identifying accurate risks and formulating sound policies.

PCC champions the synergy of economic rationale and empirical data, pivotal in fostering consensus and enabling effective policymaker engagement. In essence, PCC embodies a pioneering spirit committed to navigating uncharted territories, propelling well-informed policy decisions for India's holistic growth.

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Table of Contents

List of Abbreviations.....	1
Glossary of Terms	2
1. Introduction	3
2. Definitions, Classification, and the Dispersal Question	3
3. Government Policy: Central and State.....	5
4. Current Regulatory Framework	9
4.1 Institutional Structure	9
4.2 Approvals Required	10
4.3 Regulatory Position on Noise	11
4.4 Regulatory Position on Electricity	11
4.5 Regulatory Position on Water	11
4.6 Efficiency Standards (BIS)	11
5. International Regulatory Experience	12
5.1 The Global Emergence and Growth of the Data Centre Industry	12
5.2 Reasons for Locating Near Residential Areas	13
6. Comparing International and Indian Practice.....	13
6.1 What the World Has Done	13
6.2 What India Has Done	14
7. Technological Developments	15
8. Issues at Hand.....	15
8.1 Noise	15
8.2 Electricity	16
8.3 Water	16
8.4 Setback Distance.....	17
9. Where India Stands on Efficiency	18
10. Webinar Discussion.....	20
10.1 On Growth and Demand.....	20
10.2 On Coexistence with Residential Areas	20
10.3 On the Regulatory Landscape	21
10.4 On Data and Evidence	21
10.5 On Power and Cooling	22
10.6 On Efficiency Benchmarks	22
10.7 On National and State Roles.....	23
11. Recommendations.....	23
References.....	26

List of Abbreviations

Abbreviation	Full Form
AI	Artificial Intelligence
BEE	Bureau of Energy Efficiency
BFSI	Banking, Financial Services, and Insurance
BIS	Bureau of Indian Standards
CAQM	Commission for Air Quality Management in National Capital Region and Adjoining Areas
CEEW	Council on Energy, Environment and Water
CER	Cooling Efficiency Ratio
CPCB	Central Pollution Control Board
CRU	Commission for Regulation of Utilities (Ireland)
CUE	Carbon Usage Effectiveness
DCD	DataCenterDynamics
DCEZ	Data Centre Economic Zone
DTU	Delhi Technological University
EnEfG	Energy Efficiency Act (Germany)
GW	Gigawatt
IEEFA	Institute for Energy Economics and Financial Analysis
ISO/IEC	International Organization for Standardization / International Electrotechnical Commission
IT	Information Technology
ITES	Information Technology Enabled Services
LEED	Leadership in Energy and Environmental Design
MeitY	Ministry of Electronics and Information Technology
MW	Megawatt
NACo	National Association of Counties
NASSCOM	National Association of Software and Service Companies
PAT	Perform, Achieve and Trade
PIB	Press Information Bureau
PUE	Power Usage Effectiveness
QCO	Quality Control Order
SEC	Specific Energy Consumption
SGST	State Goods and Services Tax
SHANTI	Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India
TRAI	Telecom Regulatory Authority of India
WRI	World Resources Institute
WUE	Water Usage Effectiveness

Glossary of Terms

Colocation data centre: A facility in which multiple tenant organisations lease space, power, and cooling infrastructure within a shared facility.

Cooling Efficiency Ratio (CER): A metric isolating the electricity consumed by a data centre's cooling systems relative to its computing load.

Edge data centre: A smaller, distributed facility located close to end-users to minimise latency; the category most frequently located within or adjacent to dense urban and residential areas.

Enterprise data centre: A facility owned and operated by a single organisation for its own internal use.

Hyperscale data centre: A very large installation, typically owned by a major cloud service provider, built to accommodate hundreds of megawatts of information technology load across an extensive campus.

Power Usage Effectiveness (PUE): The ratio of a data centre's total facility electricity consumption to the electricity consumed by its computing equipment alone; a lower value indicates greater efficiency.

Quality Control Order (QCO): An order issued by the Government of India under the Bureau of Indian Standards Act, 2016, that makes compliance with a specified Indian Standard mandatory.

Setback distance: The minimum distance a facility must maintain from the nearest residential property line under a jurisdiction's zoning or planning rules.

Specific Energy Consumption (SEC): Energy used per unit of production in an industrial facility; the metric used to set reduction targets under India's Perform, Achieve and Trade scheme.

Water Usage Effectiveness (WUE): A metric measuring a data centre's annual water consumption in litres relative to the annual energy consumption of its computing equipment in kilowatt-hours.

Water-stressed region: A region where total water demand approaches or exceeds available renewable supply, or where water quality restricts use.

1. Introduction

India's data centre sector has expanded rapidly over the past five years, evolving from a modest domestic industry into a significant pillar of the country's digital infrastructure ambitions. Operational capacity has grown more than fourfold, from approximately 375 megawatts (MW) in 2020 to over 1,575 MW in 2025 (MeitY, 2026), with projections suggesting this could reach between 4.5 and 9 gigawatts (GW) by 2030, depending on the estimating methodology employed (CEEW, 2026a; IEEFA, 2025). Cumulative investment commitments in the sector are estimated at approximately USD 95 billion between 2019 and 2025 (CEEW, 2026a).

This growth has been driven by rising cloud adoption, the rollout of 5G networks, data localisation requirements introduced under the Digital Personal Data Protection Act, 2023, and the accelerating demand for computing infrastructure to support artificial intelligence (AI) workloads. At the national level, data centres continue to account for a modest share of overall resource consumption, representing less than one per cent of India's total installed power capacity (MeitY, 2026) and approximately 0.5 per cent of national electricity consumption (CEEW, 2026a).

At the state and city level, however, capacity remains concentrated in a small number of locations. In Parliament, the line ministry stated that, per industry sources, Mumbai and Navi Mumbai together accounted for approximately 790 MW of operational capacity, followed by Chennai (305 MW), Bengaluru (182 MW), Hyderabad (152 MW), Delhi NCR (76 MW), and all other locations including Pune and Kolkata (15 MW), against a total of approximately 1,520 MW at that time (Lok Sabha Unstarred Question No. 4312, 18.03.2026). On these figures, the top five locations together accounted for approximately 99 per cent of reported capacity. Parliamentary replies also indicate that the industry is expanding into states such as Andhra Pradesh, Madhya Pradesh, Chhattisgarh, and West Bengal (Lok Sabha Unstarred Question No. 2837, 05.08.2026).

The sections that follow examine the classification of data centres by type and scale and the structural drivers of geographic concentration in India; the central and state policy architecture governing the sector; the current Indian regulatory framework; prevailing international regulatory experience; and the technological and policy practices that may support the sustainable coexistence of data centre infrastructure with the communities and resource systems situated near it.

Section 10 summarises a webinar discussion held on 22 September 2026, at which this analysis was placed before a panel of experts. Section 11 sets out recommendations drawn from both.

2. Definitions, Classification, and the Dispersal Question

Data centres are broadly classified into four categories, distinguished principally by ownership structure, scale, and physical footprint (Congress.gov, Congressional Research Service Report, 2026).

- Enterprise data centres are owned and operated by a single organisation for its own internal use.
- Colocation data centres are facilities in which multiple tenant organisations lease space, power, and cooling infrastructure within a shared facility.

- Hyperscale data centres are very large installations, typically owned by major cloud service providers, built to accommodate hundreds of megawatts of information technology (IT) load across extensive campuses.
- Edge data centres are smaller, distributed facilities located close to end-users in order to minimise latency, and are consequently the category most frequently located within or adjacent to dense urban and residential areas by design.

The scale and ownership distinctions among these categories help explain how data centre capacity is actually distributed across India, a pattern examined below. This pattern of concentration, and the questions it raises for local infrastructure planning, forms a central theme of this note.

The concentration of data centre capacity in a small number of Indian cities, noted in Section 1, is attributable principally to established connectivity and demand infrastructure rather than to state policy incentives.

International submarine cable landing infrastructure is the most significant factor. Mumbai currently hosts landing stations for 14 to 15 international cable systems, and Chennai hosts 9, together accounting for the large majority of India's international bandwidth capacity (TeleGeography, 2025). Four additional submarine cable systems are under commissioning at Mumbai and Chennai landing stations, and three further systems are under planning, for which applications have been submitted to the Department of Telecommunications (Lok Sabha Unstarred Question No. 4312, 18.03.2026; Wire & Cable India, 2026). Enterprise demand patterns reinforce this concentration. Mumbai's data centre demand is closely linked to the concentration of banking, financial services, and insurance (BFSI) headquarters in the city, while Bengaluru's demand is driven substantially by multinational Global Capability Centres rather than by cable connectivity. Existing dedicated power infrastructure and established industrial land ecosystems in these cities further reduce the marginal cost of locating additional capacity where capacity already exists.

Government policy has, in parallel, sought to encourage dispersal of capacity away from this concentration. The Draft National Data Centre Policy, 2020 proposed at least four Data Centre Economic Zones (DCEZs), intended to offer pre-provisioned infrastructure, connectivity, and power outside the existing metropolitan hubs. MeitY's revived consultations on this policy reportedly place explicit emphasis on promoting development in tier-2 and tier-3 cities, with the stated aim of reducing dependence on existing hubs and improving sectoral disaster resilience (BW Legal World, 2026). This dispersal is also becoming visible, independent of policy intervention. Parliamentary replies indicate that the industry is expanding into Andhra Pradesh, Madhya Pradesh, Chhattisgarh, and West Bengal (Lok Sabha Unstarred Question No. 2837, 05.08.2026), and new submarine cable landing infrastructure is being developed at Machilipatnam, Digha, and Visakhapatnam, which is expected to reduce the concentration of connectivity currently centred on Mumbai and Chennai. Kochi has been identified as an emerging location specifically because it possesses its own cable landing stations, reinforcing that connectivity infrastructure, rather than state incentive design alone, remains a decisive variable even in the dispersal pattern.

3. Government Policy: Central and State

The Government of India's engagement with the data centre sector has, to date, focused primarily on measures to facilitate investment and ease of doing business. Sector-specific operational regulation, by contrast, remains at an early stage of development.

The Draft National Data Centre Policy, circulated by the Ministry of Electronics and Information Technology (MeitY) in 2020, remains the most comprehensive central articulation of policy intent for the sector. The draft policy proposed the conferral of infrastructure status upon data centres to ease access to long-term credit, the establishment of a National Single Window System for time-bound clearances, the creation of at least four DCEZs offering concentrated, pre-provisioned infrastructure, and the recognition of data centres as an essential service under the Essential Services Maintenance Act framework administered by state governments. The draft further proposed a separate category for data centres within the National Building Code, and included a provision to encourage the use of renewable energy for data centres, whether solar or wind-based, in collaboration with the Ministry of Power (MeitY, 2020).

The draft policy was never formally notified. The Council on Energy, Environment and Water (CEEW) has observed that central support for the sector has instead proceeded through narrower, discrete measures. One such measure was the conferral of infrastructure status on data centres above 5 MW in October 2022. This followed a recommendation by the Telecom Regulatory Authority of India (TRAI). A second measure was the announcement of a long-term tax holiday for data centre and cloud investments, extending to 2047 (CEEW, 2026a).

In the absence of a finalised central framework, state governments have emerged as the primary source of binding, operative policy for the sector, with several states introducing dedicated data centre or information technology policies containing sector-specific provisions (NASSCOM, 2025). Of the sixteen state policies reviewed for this note, eleven take the form of a policy written specifically for data centres; the remaining five – Maharashtra, Gujarat, Chhattisgarh, Bihar, and Manipur – address the sector only within a broader information technology or industrial investment policy. Table 1 summarises the principal provisions across all sixteen states. Where a cell records that a provision is not specified, this reflects the policy text itself remaining silent on the point rather than a gap in the sources consulted; this is most common among the five states without a policy dedicated to data centres specifically.

Table 1: Comparison of State-Level Data Centre Policy Provisions

S. No.	State	Policy	Location Permission	Essential Service Status	Building and Setback Provisions	Key Fiscal Incentives	Power Sourcing Provisions	Distinctive Feature
1	Karnataka	Data Centre Policy, 2022–2027	Permitted in commercial, industrial, and institutional zones; not	Yes – classified as a public utility service ¹ under the Industrial	Enhanced floor area ratio; ground coverage up to 60%;	Stamp duty exemption on first 10 acres of land (outside Bengaluru Urban district)	Dual grid connection s; open	–

¹A public utility service is a legal classification under the Industrial Disputes Act, 1947 that limits certain kinds of industrial action against facilities providing essential goods or services. It serves a purpose similar to the Essential Services Maintenance Act classification used by other states, though the two operate under separate statutes.

S. No.	State	Policy	Location Permission	Essential Service Status	Building and Setback Provisions	Key Fiscal Incentives	Power Sourcing Provisions	Distinctive Feature
			extended to residential zones	Disputes Act, 1947	boundary wall height up to 3.6m		access ² for consumers above 1 MW	
2	Uttar Pradesh	Data Centre Policy, 2021 (lapsed January 2026; 2026 draft pending)	Not specified in the policy text reviewed	Yes, under the Essential Services Maintenance Act	Enhanced floor area ratio; ground coverage up to 60%; boundary wall height up to 3.6m	7% capital subsidy (₹20 crore ceiling); land subsidy; stamp duty exemption	Deemed distribution licence ³ for park developers; open access	Cross-subsidy surcharge ⁴ exemption phases down gradually over five years rather than ending abruptly; approval authority is tiered by investment size, up to state cabinet level
3	West Bengal	Data Centre Policy, 2021	Not specified; general building-norm relaxations apply	Yes	Enhanced floor area ratio; ground coverage up to 60%	100% stamp duty exemption; electricity duty waiver for 5 years	Dual grid connections; open access	Edge data centres are specifically encouraged to locate within existing government IT and industrial parks
4	Tamil Nadu	Data Centre Policy, 2021	Permitted in commercial, industrial, and institutional zones; not extended to residential zones	Not specified in the policy text reviewed	Follows Tamil Nadu Combined Development and Building Rules, 2019; boundary wall height up to 3.6m; no setback distance specified	Stamp duty concession (50–100%, by category); capital and infrastructure subsidies	Open access; captive power up to 20% of eligible fixed assets	Green-building subsidy is conditional on independent certification ⁵ (IGBC or GRIHA); edge data centres receive case-by-case consideration for a structured incentive package
5	Odisha	Data Centre Policy, 2022	Not specified in the policy text reviewed	Implied via a general industrial-relations law; not stated specifically	Not detailed in the policy text reviewed	20% capital subsidy (₹25 crore ceiling); land subsidy; tax reimbursement	Dual grid connections; open access; captive	–

²Open access is a regulatory arrangement that allows a large power consumer to purchase electricity directly from a generator, including a renewable energy producer, rather than only through the local electricity distribution company.

³A deemed distribution licence is a special authorisation that allows a private developer, rather than the state electricity board, to distribute and bill power within its own site, such as a data centre park.

⁴A cross-subsidy surcharge is an additional charge ordinarily paid by large industrial power users to offset the lower electricity rates charged to smaller or residential consumers.

⁵The Indian Green Building Council (IGBC) and the Green Rating for Integrated Habitat Assessment (GRIHA) are India's two principal third-party certification systems for independently verifying a building's environmental performance.

S. No.	State	Policy	Location Permission	Essential Service Status	Building and Setback Provisions	Key Fiscal Incentives	Power Sourcing Provisions	Distinctive Feature
				for data centres			generation permitted	
6	Telangana	Data Centres Policy, 2016	Not specified in the policy text reviewed	Yes, under the state Essential Services Maintenance Act	Not specified in the policy text reviewed	Up to 50% rebate on building fees; subsidised land; startup-specific support	Open access; captive power; power supplied at cost to eligible units	Facilities above approximately 20,000 sq. m. of built-up area remain subject to environmental clearance despite the general inspection exemption
7	Maharashtra	IT and ITES Policy, 2023	Permitted in any zone, including residential, no-development, and green zones	Yes, under the Essential Services Maintenance Act	Not detailed in the policy text reviewed	Property tax at residential rates; stamp duty and electricity duty exemptions	Open access; captive power plants permitted	—
8	Jharkhand	IT, Data Center and BPO Investment Promotion Policy, 2023	Not specified; floor area bonus applies	Yes, under the Essential Services Maintenance Act	Floor area ratio increased by 50% above the otherwise permissible limit	Interest subsidy (₹50 crore ceiling per park); land subsidy; electricity duty reimbursement for 5 years	Not specified in the policy text reviewed	A Data Centre Park requires a minimum of five separate units in addition to a minimum power capacity, unlike other states' capacity-only threshold
9	Haryana	State Data Centre Policy, 2022	Not specified in the policy text reviewed	Yes, under the Haryana Essential Services Maintenance Act, 1974	Relaxed floor area ratio under the Haryana Building Code; exempted from certain municipal building-permit requirements	100% stamp duty exemption on first transaction; Net SGST reimbursement (50–75%, by category, for 10 years)	Dual grid connections	—
10	Tripura	Data Centre Policy, 2021	Not specified in the policy text reviewed	Yes, under the state Essential Services Maintenance Act	Not specified in the policy text reviewed	50% floor-rental discount for 5 years; capital investment subsidy up to 30% (tiered by turnover)	Open access; captive solar and wind generation permitted	—
11	Rajasthan	Data Centre Policy, 2025	Not identified in	Not identified in the sections reviewed	Ground coverage up to 70%; setback compliance	Capital subsidy of 10–20% of eligible fixed capital investment (by	Not identified in the sections reviewed	Requires an irreversible, one-time choice between the capital subsidy

S. No.	State	Policy	Location Permission	Essential Service Status	Building and Setback Provisions	Key Fiscal Incentives	Power Sourcing Provisions	Distinctive Feature
			the sections reviewed ⁶		referenced without a specified distance	category); electricity duty exemption for 7 years; partial stamp duty exemption		and the interest subsidy route
12	Andhra Pradesh	Data Center Policy 4.0, 2024–2029	Not specified in the policy text reviewed	Not specified in the policy text reviewed	Case-by-case relaxations for large projects	Net state goods and services tax reimbursement, or a 10% capital subsidy	Standard industrial tariff; partially state-funded backup grid connection for large projects	Approval authority is tiered by investment size, up to state cabinet level
13	Gujarat	IT/ITeS Policy, 2022–2027	Permitted only within a designated “IT Township” model; not a general data centre provision	Not specified in the policy text reviewed	Limited flexibility, confined to the IT Township model	25% capital subsidy (ceiling varies by project category); operating-expenditure support for 5 years	Not specified in the policy text reviewed	Capital subsidy is capped relative to floor space per employee, limiting subsidy claims on underutilised construction
14	Chhattisgarh	Industrial Development Policy, 2024–2030 (data centres addressed under a sector-specific package, not a standalone policy)	Not specified in the policy text reviewed	Not specified in the policy text reviewed	Not specified in the policy text reviewed	Net state goods and services tax reimbursement (up to 150% of investment) or a capital grant; stamp duty exemption; electricity duty exemption for 12 years	Not specified in the policy text reviewed	–
15	Bihar	IT Policy, 2024 (data centres identified as a focus sector, without a standalone policy)	Not specified in the policy text reviewed	Not specified in the policy text reviewed	Not specified in the policy text reviewed	Capital subsidy of 30% (₹30 crore ceiling); 50% lease rental subsidy; 25% power tariff reimbursement	Not specified in the policy text reviewed	Approval authority is tiered by investment size, up to state cabinet level; ownership-linked incentive eligibility is retained only if a change in ownership stays within the same eligible category

⁶Unlike the other states in this table, Rajasthan's policy document was accessible only as a scanned image file rather than searchable text. The cells marked here reflect the sections that could be reviewed in that format; the policy may address these points elsewhere in the document.

S. No.	State	Policy	Location Permission	Essential Service Status	Building and Setback Provisions	Key Fiscal Incentives	Power Sourcing Provisions	Distinctive Feature
16	Manipur	Information Technology Policy, 2022 (data centres referenced only briefly; no standalone policy)	Not specified in the policy text reviewed	Yes – though this follows from the whole IT/ITES sector's classification, not from data centres specifically	Not specified in the policy text reviewed	General IT-sector incentives apply; no data centre-specific provision	Not specified in the policy text reviewed	–

Source: Compiled by author, based on state government policy documents accessed via MeitY's state data centre policy repository (ambud.meit.gov.in/datacentrepolicies) and NASSCOM, 2025.

Maharashtra's residential-zone location permission is not a new provision. An identical clause first appeared in the state's IT/ITES Policy of 2015, which permitted IT/ITES units, with limited exceptions, to be established in any zone, including residential and no-development zones (Government of Maharashtra, 2015). At the time, the category IT/ITES unit referred principally to office-based activity, such as software development and business process outsourcing. The 2023 policy extended this pre-existing provision to explicitly include data centres. Among the other states reviewed, Karnataka and Tamil Nadu take the opposite approach on this specific point. Both confine data centre location to commercial, industrial, and institutional zones, explicitly stopping short of residential zones. The remaining states do not address the question directly in their policy text.

Independent or renewable power sourcing is now a common feature of state-level data centre policy, though the specific mechanism varies. Several states provide for open access, allowing an eligible consumer to purchase power directly from a generator rather than solely through the local distribution company, typically alongside permission to establish captive renewable generation; this includes Maharashtra, Karnataka, Odisha, Tamil Nadu, and Telangana. A smaller number of states go further, allowing a data centre park developer to itself become a licensed power distributor within its site. Uttar Pradesh's draft 2026 policy proposes this model, mirroring an arrangement already in use in Andhra Pradesh, where a discom licence has been granted to a major data centre developer. Several states also provide for a dual grid connection, a second, independent power line intended to reduce the risk of outage, including Uttar Pradesh, Karnataka, Odisha, West Bengal, and Haryana. Taken together, these provisions suggest that resilience of supply is as significant a driver of state policy in this area as renewable sourcing itself.

4. Current Regulatory Framework

4.1 Institutional Structure

Regulatory authority over data centres in India is distributed across three tiers of government, with no single tier holding comprehensive responsibility for the sector. The central government sets enabling policy and classification. This includes the measures described in Section 3, together with generally applicable central legislation such as the Environment (Protection) Act, 1986, the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, and the rules made under them. State

governments set the operative policy framework described in Section 3, and administer the approvals set out below through state agencies, including State Pollution Control Boards and State Environment Impact Assessment Authorities. Urban local bodies implement rather than set policy, issuing building permits, fire no-objection certificates, and water and sewage connections in accordance with state and central requirements.

4.2 Approvals Required

A data centre requires the following approvals prior to construction.

- An Environmental Clearance under the Environment Impact Assessment Notification, 2006, where built-up area meets or exceeds 20,000 square metres, applied under Item 8 of the Notification, covering building, construction, area development, and township projects, and applying identically, on the basis of built-up area alone, to residential buildings, commercial buildings, hotels, hospitals, and office-based information technology units.
- A Consent to Establish from the State Pollution Control Board under the Water Act and the Air Act.
- A provisional fire no-objection certificate from the state fire service, and building plan approval from the relevant municipal authority.
- A no-objection certificate from the Central Ground Water Authority, where groundwater is to be used as a water source.

Building and construction projects, including data centres, are exempted from the public consultation requirement that otherwise applies to Category A and Category B1 projects under the Environmental Impact Assessment Notification, 2006. This exemption applies to the entire category, regardless of built-up area or B1/B2 classification (Environmental Impact Assessment Notification, 2006, paragraph 7(i), exception (d)).

Following construction, the following approvals and obligations apply.

- A Consent to Operate from the State Pollution Control Board, with renewal frequency determined by pollution category, ranging from annual renewal for Red category facilities to five-yearly renewal for Green category facilities, with White category facilities exempted.
- A final fire no-objection certificate and municipal occupancy certificate.
- Registration of backup diesel generator sets, subject to a noise limit of 75 decibels measured at one metre from the acoustic enclosure, with a minimum enclosure insertion loss of 25 decibels (CPCB, n.d.).
- Six-monthly compliance reports against Environmental Clearance conditions, submitted to the relevant Regional Office of the Ministry of Environment, Forest and Climate Change, the Zonal Office of the Central Pollution Control Board, and the State Pollution Control Board.
- An annual Form V Environmental Statement filed with the State Pollution Control Board by 30 September, disclosing water, raw material, and energy consumption for the preceding financial year.

None of the above requirements are specific to data centres as a facility type.

4.3 Regulatory Position on Noise

Noise levels at a facility's boundary are governed by the Noise Pollution (Regulation and Control) Rules, 2000, which set ambient limits by area classification rather than by facility type, as set out in Table 2.

Table 2: Ambient Noise Standards under the Noise Pollution (Regulation and Control) Rules, 2000

S.No.	Area category	Day (6 a.m. to 10 p.m.)	Night (10 p.m. to 6 a.m.)
1	Industrial	75 dB(A)	70 dB(A)
2	Commercial	65 dB(A)	55 dB(A)
3	Residential	55 dB(A)	45 dB(A)
4	Silence zone	50 dB(A)	40 dB(A)

Source: Compiled by author, based on the Noise Pollution (Regulation and Control) Rules, 2000.

A facility situated in a residential area, including under a state zoning exemption of the kind described in Section 3, is subject to the residential category limit, unless the state government has separately declared the area a different or mixed category for the purposes of these Rules.

4.4 Regulatory Position on Electricity

There is no statutory cap on the quantity of electricity a data centre may draw. Regulation operates through the sanctioned load approval process with the relevant electricity distribution company, and through the essential service classification described in Section 3, which governs priority of access rather than quantity of consumption. This is complemented by measures encouraging renewable and captive power sourcing for the sector, both by the central government and by several states, discussed further in Section 6.

4.5 Regulatory Position on Water

There is no statutory cap on the quantity of municipal or surface water a facility may be allocated. The Ministry of Jal Shakti mandates that bulk water users consuming more than 5,000 litres per day install sewage treatment plants and reuse treated wastewater, with national reuse targets rising from 20 per cent by 2027-28 to 50 per cent by 2030-31. Maharashtra's policy separately mandates the use of recycled water by urban industries. These reuse mandates govern the treatment of water already consumed; they do not limit the initial volume of potable water a facility may be allocated. The only water source subject to a statutory extraction limit is groundwater, governed by Central Ground Water Authority guidelines calibrated to the extraction category of the area concerned.

4.6 Efficiency Standards (BIS)

The Bureau of Indian Standards, through its LITD 31 technical committee on Cloud Computing, IT, and Data Centres, has published a series of Indian Standards covering four efficiency metrics for data centres, aligned with corresponding ISO/IEC frameworks (Lok Sabha Unstarred Question No. 2990, 05.08.2026).

- Power Usage Effectiveness (IS/ISO/IEC 30134-2), measuring total facility electricity consumption relative to the electricity consumed by computing equipment alone.
- Cooling Efficiency Ratio (IS/ISO/IEC 30134-7:2023), isolating electricity consumed by cooling systems relative to computing load.
- Water Usage Effectiveness (IS/ISO/IEC 30134-9:2022), measuring annual water consumption in litres relative to the annual energy consumption of computing equipment in kilowatt-hours.
- Carbon Usage Effectiveness (IS/ISO/IEC 30134-8:2022), connecting data centre operation with carbon performance, measured as carbon dioxide-equivalent emissions relative to IT equipment energy consumption.

Alongside these efficiency metrics, the same February 2026 notification also extended to the IS/ISO/IEC 22237 series, covering data centre facility design, power distribution, and environmental control (Schneider Electric, 2026). This series addresses physical infrastructure and construction requirements, distinct from the operational efficiency metrics above.

Compliance with these standards is voluntary. They would become mandatory only if the Government were to issue a Quality Control Order under the Bureau of Indian Standards Act, 2016, applying them to the sector; no such order has been issued to date.

5. International Regulatory Experience

5.1 The Global Emergence and Growth of the Data Centre Industry

Data centres originated as dedicated computer rooms during the mainframe era of the 1950s and 1960s (Datacate, 2026). Growth accelerated through the 1990s with the rise of shared facilities housing servers for multiple businesses. The 2000s saw the shift to cloud computing, producing the first large-scale facilities. Since the 2010s, growth has been driven by very large campuses built by major technology companies, alongside smaller facilities placed close to end-users. More than 600,000 data centres are estimated to exist worldwide (Datacate, 2026).⁷

This growth is unevenly distributed, not unlike India. As of November 2025, the United States accounted for nearly half of all data centre facilities worldwide; North America as a whole held approximately 48 per cent of global capacity (Cargoson, 2025). Europe held over 3,300 facilities across 45 countries, led by Germany and the United Kingdom. The Asia-Pacific region held approximately 1,800 facilities, led by China, Australia, and Japan (Cargoson, 2025).

Investment is beginning to disperse beyond these established markets. Latin American markets, including Brazil, Chile, Mexico, and Colombia, and Southeast Asian markets, including Singapore, Malaysia, and Indonesia, have attracted significant new investment, driven by power availability, cost, and supportive regulation (DevelopmentAid, 2026).

⁷This figure and the regional breakdown that follows are drawn from different sources and likely reflect different definitions of “data centre” – the global estimate probably includes small enterprise server rooms, while the regional breakdown likely tracks only larger, commercially significant facilities. The two figures should not be read as directly reconcilable.

5.2 Reasons for Locating Near Residential Areas

Urban and near-urban location remains the dominant global pattern for data centres, though some large facilities with lower time-sensitivity requirements have located on less costly land in less populated regions (Mappr, 2026). This pattern follows from two operational requirements. First, many digital services, including banking, payments, and video communication, require data to travel a short distance between the user and the processing server to minimise delay. Second, cities already have the electricity grids, fibre-optic networks, and skilled workforce a data centre requires, reducing the cost of building this infrastructure anew elsewhere. No global figure was identified quantifying precisely what share of data centres sit within residential areas specifically, though the urban-proximity pattern described above indicates that many of these facilities are in residential areas.

Digital infrastructure of this kind now underlies most core functions of a modern economy, including banking, healthcare records, government services, and education. As India's digital economy expands, and as data localisation requirements increase domestic hosting, the number of facilities within or near Indian cities is expected to continue growing.

6. Comparing International and Indian Practice

In India, hyperscale facilities exceeding 200 MW of IT load have also been located on land adjoining or within residential areas, in addition to edge deployments, owing to state-level land-use exemptions of the kind discussed in Section 3.⁸

Residential-proximity considerations in the Indian context therefore extend across facility types and scales, rather than being confined to edge deployments alone. Banning data centres in residential areas outright is not, however, a feasible response in the present digital economy, given how deeply this infrastructure is embedded in everyday economic functioning. Regulation, rather than prohibition, is the approach most countries have adopted to enable coexistence between data centres and surrounding communities, addressing specific, measurable aspects of facility operation. Three instruments recur across jurisdictions.

- Setback requirements, specifying a minimum distance between a facility and the nearest home
- Noise limits, specifying a maximum decibel level at the boundary of the nearest home
- Resource-disclosure and renewable-sourcing requirements, covering electricity and water consumption

6.1 What the World Has Done

Germany requires data centres to source 50 per cent of electricity from renewable generation from January 2024, rising to 100 per cent from January 2027 (Energy Efficiency Act (EnEfG),

⁸Individual Indian hyperscale campuses at this scale, including projects in the 300 to 400 MW range, continue to be developed under state land-use exemptions such as Maharashtra's residential-zone permission discussed in Section 3 (real estate industry reporting, 2025-2026). Investigative reporting has separately raised concern that some states approve such facilities, including in clusters, without a cumulative assessment of land, water, and energy impact (Behanbox, 2026).

Germany, s.11(5), 2023); a 2026 amendment has since extended the 100 per cent deadline to January 2030. Ireland requires new data centres above a minimum capacity threshold to source at least 80 per cent of annual electricity demand from new renewable generation built in Ireland, on a six-year glide path, and separately to provide their own dispatchable generation or storage matching their grid import capacity (Commission for Regulation of Utilities, Ireland, Data Centre Connection Policy Decision, December 2025). The European Union has incorporated renewable-sourcing disclosure into a common sustainability rating, applicable to data centres of meaningful size from 2026 (European Commission, 2026).

6.2 What India Has Done

India's regulatory approach addresses the same broad categories, though through separate general-purpose laws rather than a single framework. Location is governed by state-level zoning categories, discussed in Section 3. Of the states reviewed, only Maharashtra explicitly permits data centres in residential zones; Karnataka and Tamil Nadu explicitly confine location to commercial, industrial, and institutional zones, and the remaining states do not address the question in their policy text. Noise is governed by the Noise Pollution (Regulation and Control) Rules, 2000, which apply a residential-zone limit of 55 decibels by day and 45 decibels by night. Electricity consumption is regulated through the sanctioned load approval process rather than a fixed cap. Water consumption carries no allocation cap either, though bulk users are required to reuse a rising share of treated wastewater under Ministry of Jal Shakti norms, and groundwater extraction is separately capped under Central Ground Water Authority guidelines. Voluntary efficiency standards covering power, cooling, water, and carbon performance have been published by the Bureau of Indian Standards, though compliance with them is not yet mandatory.

Table 3 compares international practice in these areas with the current Indian framework in summary.

Table 3: Comparison of International and Indian Data Centre Resource Regulation

S.No.	Area	International practice	Indian framework
1	Setback distance	Minimum setback distances set in law, typically 200 to 500 feet from residential property, depending on jurisdiction	Governed by state-level zoning and building-use categories, under respective state industrial and IT/ITES policies
2	Noise	Maximum decibel limits, generally 45 to 65 decibels at the property boundary, applied specifically to data centres in several jurisdictions	Residential-zone limit of 55 decibels (day) and 45 decibels (night), under the Noise Pollution (Regulation and Control) Rules, 2000
3	Electricity	No absolute consumption cap identified in the countries studied; several require public disclosure	Governed by the sanctioned load approval process with the relevant electricity distribution company
4	Water	No absolute allocation cap identified in most countries studied; several require	Bulk users required to install treatment plants and reuse 20 to 50 per cent of wastewater by 2030-31 (Ministry of Jal Shakti norms);

S.No.	Area	International practice	Indian framework
		disclosure and treated-wastewater use	groundwater extraction separately capped under Central Ground Water Authority guidelines
5	Renewable sourcing	Mandatory minimum renewable shares in force or scheduled in several countries; sustainability reporting increasingly mandatory	Renewable power available through open access, green tariffs, and renewable energy certificates; no minimum renewable share currently mandated
6	Efficiency	Mandatory efficiency targets tied to approval or continued operation in some countries	Voluntary technical standards published by the Bureau of Indian Standards (LITD 31 committee)

Source: Compiled by author, based on National Association of Counties (NACo), 2026, and jurisdictional standards cited in Section 8.1.

7. Technological Developments

Regulation is not the only lever available for managing the resource impact of data centres. Changes in the underlying technology itself have, in parallel, reduced some of the strain that gives rise to residential-proximity and resource concerns in the first place, particularly in relation to cooling and backup power.

Cooling technology accounts for the largest share of both water use and noise generation in a data centre. Older facilities typically use evaporative cooling, which consumes large volumes of water and generates substantial noise. Newer facilities increasingly use liquid cooling, in which fluid is circulated directly around computer chips, reducing reliance on large fans. The extent of any resulting water saving depends on the heat-rejection method the system is paired with, discussed further in Section 8.3.

Backup diesel generators are a further source of noise. In India, these must be housed in an acoustic enclosure, or in an acoustically treated room, designed to reduce noise by at least 25 decibels (CPCB, n.d.). Some facilities now pair diesel generators with battery storage systems, which reduce how often the generator needs to run. This lowers overall noise exposure without eliminating the generator itself (Data Center Knowledge, 2026).

8. Issues at Hand

The preceding sections have described the current Indian regulatory framework and international practice governing three specific concerns raised about data centres located near residential areas, namely noise, electricity, and water. This section assesses each concern against comparable real-world benchmarks. The purpose is to distinguish concerns substantially addressed by existing regulation, subject to enforcement, from concerns that raise a more substantive tension requiring further measures.

8.1 Noise

Continuous noise from a data centre's cooling plant, transformers, and ventilation typically registers between 45 and 65 decibels at the property boundary, based on a comparison of

jurisdictional standards internationally (Loudoun County, Virginia Zoning Ordinance; Ireland EPA, NG4 Guidance Note; Data Center List, 2026). This range can be compared against ambient noise conditions independently measured in the same Indian cities where data centre capacity is concentrated. A joint study by the National Physical Laboratory, the Central Pollution Control Board, and the Delhi Technological University, across seventy monitoring stations in Mumbai, Delhi, Kolkata, Bengaluru, Chennai, Hyderabad, and Lucknow, found that no monitored site in a residential, commercial, or silence zone met its applicable ambient noise standard. Silence zones recorded 56 to 77 decibels against a 50-decibel daytime limit (National Physical Laboratory, CPCB & DTU, cited in Deccan Herald, 2026). On this evidence, a data centre's continuous noise contribution falls within, rather than substantially above, the ambient noise environment already prevailing in these cities. The operative gap is enforcement of existing standards under the Noise Pollution (Regulation and Control) Rules, 2000, rather than the absence or inadequacy of the standards themselves.

8.2 Electricity

Unlike noise and water, this assessment relies on a supply-and-demand trajectory comparison rather than a jurisdictional benchmark, since no comparable international benchmark on absolute electricity consumption caps was identified in Section 6. Data centre electricity demand is projected to rise from approximately 1.4 gigawatts (GW) in 2024 to approximately 9 GW by 2030, raising the sector's share of national power consumption from under 1 per cent to approximately 3 per cent (IEEFA, 2025). India's installed renewable energy capacity stood at approximately 296 GW in August 2026. Including nuclear power, total non-fossil capacity stood at approximately 304 GW (Ministry of New and Renewable Energy, 2026). The national target is 500 GW of non-fossil capacity by 2030 (PIB, 2024). The planned addition of roughly 196 GW is substantially larger than the additional demand from data centres alone. This trajectory suggests that the sector's growing electricity demand can be absorbed within the country's planned non-fossil capacity addition, provided that addition continues on schedule.

8.3 Water

Water is the more contested of the three concerns, for two reasons specific to its nature. First, unlike noise or electricity, the choice of cooling technology substantially determines a facility's water footprint, and that choice is itself shaped by local climate. Second, India's own water resource position is more strained at the outset, independent of data centre demand.

A typical 100 MW hyperscale facility using water-based cooling can consume approximately 800,000 to 2 million litres of water per day, according to Indian sector estimates (CEEW, 2026a; CEEW, 2026b).⁹ At the national level, India's data centres consumed an estimated 150 billion litres of water in 2024-25, projected to rise to approximately 358 billion litres by 2030, though this remains approximately 0.02 to 0.03 per cent of national water demand at present (CEEW, 2026a; Mordor Intelligence, 2025).

⁹This range synthesises two separate CEEW estimates for different scenarios, a general estimate and one specific to evaporative cooling, rather than a single reported figure.

A region is classified as water-stressed where total water demand approaches or exceeds available renewable supply, or where water quality restricts use, rather than by reference to any single source (WRI, 2019). In India, groundwater depletion is the most visible driver of this stress, particularly across northern states. Groundwater supplies between 50 and 80 per cent of domestic water use nationally, and agriculture, not industry, accounts for approximately 90 per cent of annual groundwater withdrawal. A new data centre located in a water-stressed region adds to an existing demand-supply imbalance rather than creating it, but the addition remains material at the local level, discussed further in Section 6.

Cooling technology is the single largest determinant of a data centre's water footprint, and more water-efficient options are increasingly available. Evaporative cooling towers are efficient on energy but consume water continuously. Air-based dry cooling consumes negligible water but requires more electricity, and works less effectively in hot, humid climates such as those of Mumbai and Chennai, where much of India's data centre capacity is currently concentrated (Srivastava et al., 2018). Many facilities now adopt hybrid designs, drawing on dry cooling for part of the year and evaporative cooling only when conditions demand it, adjusting the balance to local climate rather than fixing it in advance. This means a facility's water consumption is not a fixed feature of the technology it deploys; it is a design choice shaped by the trade-off between water and energy, and by the climate of the specific location chosen.

Water availability has become a standard component of data centre site selection due diligence internationally, alongside power and connectivity, because a location that cannot sustain a facility's water requirement over its operating life represents a direct commercial and reputational risk to the developer. Google's 2023 Environmental Report discloses that the company has adopted a water risk framework to evaluate prospective data centre sites, and that this framework has directly informed cooling technology choices, including the selection of air cooling for new campuses where local watersheds did not meet the company's water-use threshold (Google, 2023 Environmental Report; cited in DCD, 2026). This provides an independent, business-driven check on facility location decisions in water-constrained areas, distinct from and additional to regulatory requirements.

Some facilities draw their cooling water from treated, non-potable sources rather than groundwater or municipal drinking supply. One Indian example is a data centre park in Greater Noida, which sources its cooling water entirely from a treated, non-potable network maintained separately from the residential supply by the local industrial development authority (Down To Earth, 2025). This is not yet representative of the sector as a whole. India has no uniform industry practice on water source, but replicable models of this kind exist, and India's regulatory framework already provides partial hooks for extending them, including Maharashtra's mandated use of recycled water by urban industries and the Ministry of Jal Shakti's rising treated-wastewater reuse targets for bulk users, discussed in Section 4.5.

8.4 Setback Distance

Unlike noise, electricity, and water, minimum setback distance from residential property has not emerged as a distinct point of contention in the Indian context. Current Indian regulation does not treat setback as a separate instrument the way several other jurisdictions do; it is addressed only indirectly, through the state-level zoning classifications discussed in Section 3. One partial exception is Rajasthan's 2025 policy, which references compliance with setback

norms as a condition attached to certain floor-area exemptions, though without specifying a minimum distance. This suggests the issue may be beginning to surface in state policy, even without a quantified standard in place. This is a gap relative to international practice, addressed in the recommendations in Section 11.

9. Where India Stands on Efficiency

The noise, electricity, and water concerns discussed in Section 8 are each addressed, to varying degrees, through regulation specific to that resource or that location. Efficiency regulation works differently. Rather than managing a facility's local effects, it reduces the underlying resource draw itself. A more efficient facility needs less power, consumes less water for cooling, and generates less waste heat, easing pressure on several of the concerns examined above at once.

The concept of a "green data centre" is already well established internationally, with measurable benchmarks and third-party certification, rather than being an aspirational label alone (IBM, 2026; TÜV NORD, 2026). Certification of this kind, through standards such as ISO 50001 (international standard for energy management), ISO 14001 (international standard for environmental management), and Leadership in Energy and Environmental Design (LEED) for Data Centers, a building-certification system adapted for data-centre facilities, is one mechanism for driving this. Tamil Nadu's data centre policy already uses this mechanism, tying its green-building subsidy specifically to obtaining IGBC or GRIHA certification, rather than to a self-declared sustainability claim. A second, more exacting mechanism sets and enforces numeric efficiency targets directly, through regulation rather than voluntary certification. Table 4 compares India's position on this second mechanism against two jurisdictions that already enforce binding numeric targets, Germany and the European Union, alongside a global industry benchmark, from Uptime Institute's annual worldwide survey of data centre operators, included for context rather than as a regulatory example. The table also includes India's Perform, Achieve and Trade (PAT) scheme as it applies to the cement sector, a mandatory Indian scheme unconnected to data centres, included here solely to show that India already runs this type of facility-specific, binding efficiency mandate successfully in another energy-intensive industry.

Table 4: Comparison of Data Centre Efficiency Regulation, India and Selected Jurisdictions

S.No.	Parameter	India (BIS)	Germany (EnEfG)	EU Climate Neutral Data Centre Pact	Global Benchmark (Uptime Institute)	BEE PAT Scheme (Cement)*
1	Regulatory status	Measurement methodology defined; not mandatory; no Quality Control Order issued	Legally binding	Self-reported since 2025	Industry benchmark, not a regulation	Legally binding
2	Metric	Power Usage Effectiveness (PUE), Cooling	PUE	PUE, WUE	PUE	Specific Energy Consumption (SEC)

S.No.	Parameter	India (BIS)	Germany (EnEfG)	EU Climate Neutral Data Centre Pact	Global Benchmark (Uptime Institute)	BEE PAT Scheme (Cement)*
		Efficiency Ratio, Water Usage Effectiveness (WUE), Carbon Usage Effectiveness (CUE)				
3	Target type	None set	Absolute, uniform ceiling	Absolute, uniform ceiling, climate-adjusted	Descriptive, not a target	Relative, facility-specific reduction from own baseline
4	Numeric value	Not applicable	PUE 1.2 or below for new facilities from July 2026; existing facilities 1.5 from 2027, tightening to 1.3 by 2030	PUE 1.3 (cool climates) or 1.4 (warm climates) for new facilities from 2025; WUE capped at 0.4 litres per kilowatt-hour in water-stressed areas	Global average PUE of 1.54; a PUE below approximately 1.3 to 1.4 is generally considered efficient	Approximately 4 per cent SEC reduction per compliance cycle in the cement sector; actual achievement of 2.7 to 5.3 per cent in the first cycle

Source: Compiled by author, based on Lok Sabha Unstarred Question No. 2990 (05.08.2026); Germany EnEfG s.11 (2023, amended 2026); European Commission, Climate Neutral Data Centre Pact; Uptime Institute (2025); Bureau of Energy Efficiency, PAT Scheme documentation.

*Perform, Achieve and Trade (PAT) is a mandatory Indian scheme administered by the Bureau of Energy Efficiency, requiring large energy-intensive industrial units, termed Designated Consumers, to reduce their Specific Energy Consumption, meaning energy used per unit of production, against their own baseline over a fixed compliance period. Excess reductions can be converted into tradable Energy Saving Certificates. The scheme currently applies to sectors including cement, aluminium, iron and steel, and textiles.

India has not yet set a numeric target for PUE, Cooling Efficiency Ratio (CER), WUE, or CUE, and compliance with the existing measurement methodology remains voluntary. India does, however, already administer a legally binding, facility-specific efficiency mandate in another energy-intensive sector, through the Perform, Achieve and Trade (PAT) scheme. A Quality Control Order applying numeric targets to data centres would extend an existing and proven Indian regulatory model to a new sector, rather than requiring the design of an entirely new one.

10. Webinar Discussion

Policy Consensus Centre held a webinar titled “Living Next to the Cloud: An Evidence-Based Approach to Data Centres in Residential India” on 22 September 2026. The panel comprised experts from industry, policy research, environmental consultancy and energy economics. Other participants from research and civil society also contributed.

The discussion built on the findings of this note. Section 8 found that noise and electricity are substantially addressed by existing regulation and planned infrastructure growth, with enforcement as the main gap. Water was identified as the more significant concern, arising from local resource stress rather than national scarcity. The panel examined whether data centres and residential communities can coexist, the risks this presents, and the measures that could support it. The discussion is summarised below by theme.

10.1 On Growth and Demand

Participants agreed that data centre capacity in India will grow substantially. Published estimates of capacity by the early 2030s range from about 4.5 GW to 17 GW. Even the conservative estimates imply at least a threefold increase. The drivers include cloud adoption, sectoral data localisation requirements, concerns over data sovereignty, and artificial intelligence. Global capability centres expanding into tier 2 and tier 3 cities add further demand. India generates about a fifth of the world’s data but holds a small share of global data centre capacity. Participants saw this gap as a business opportunity for the country.

The type of future demand will shape the sector’s footprint. Training AI models requires very large computing capacity in one place, which favours large hyperscale campuses. Once trained, these models are used by millions of people to answer questions and perform tasks. This everyday use requires fast response times, which favours smaller facilities located close to users. The expansion of 5G and 6G networks will add to this need. As AI use spreads, a larger share of capacity is therefore likely to sit in smaller data centres within or near cities.

10.2 On Coexistence with Residential Areas

Industry participants noted that operators prefer industrial zones wherever land is available. These zones offer high-voltage grid access, secure land title and lower operational risk. Many services still depend on proximity to users. Some capacity will therefore continue to be located within or near residential areas. Residential areas also grow around existing facilities as cities expand. In some cases, industrial development authorities have changed their rules to permit housing near operating data centres. India’s mixed land use and frequent rezoning make the boundary between residential and industrial areas unreliable over time. Coexistence between data centres and residents is therefore likely. The relevant question is how to make that coexistence work.

Participants distinguished between the construction and operation phases. Construction produces most of the visible impact on neighbours, including dust, traffic, and the movement of labour and materials. These impacts are not unlike those of any other large construction project, and can be managed through the same controls. The risk to residents from normal operations was considered low.

Backup diesel generators remain a specific concern. Data centres rely on them to maintain power during grid failures. Their use is permitted, subject to registration, noise limits and acoustic enclosures (Section 4.2). Local rules can impose further restrictions. In the National Capital Region, air quality directions restrict diesel generator use during high-pollution periods under the Graded Response Action Plan. Generators may operate during these periods only if they are fitted with emission control devices, run partly on gas, or meet the latest emission standards (CAQM, 2023). One example cited in the discussion was a generator exhaust outlet located about five metres from a residential floor. Well-enclosed generators can run for extended periods without being heard by neighbours. Their emissions nonetheless remain. This makes cleaner sources of backup and dedicated power an important consideration, discussed in Section 10.5.

10.3 On the Regulatory Landscape

Participants noted that the sector is already subject to extensive regulation, though this regulation is spread across many bodies. A single facility in Maharashtra requires roughly 40 to 48 approvals. Almost all of these are issued by state and municipal authorities. The central government's role is limited to a small number of clearances, such as the height clearance from the Airports Authority of India.

Environmental clearance applies to construction above 20,000 square metres, a threshold most data centres exceed. Participants described the process as predictive rather than penal. Appraisal committees now also ask for studies on carbon footprint, cooling systems, traffic, heat dissipation and noise. Clearance documents and six-monthly compliance reports are publicly available. Participants considered these a valuable source of facility-level data. These documents are, however, held project by project and across central and state authorities. Collating them into a usable dataset would require considerable effort.

Most approvals are obtained by developers before and during construction. Post-construction requirements are few, even though the entity operating the facility may be different from the developer.

Municipal norms written for IT and commercial buildings are also applied to data centres without adjustment. Parking is one example. Development control rules require parking spaces in proportion to a building's floor area, on the assumption of a large workforce. A data centre houses equipment rather than people, and employs very few staff. Developers must nonetheless set aside land for parking that largely goes unused. This is costly where industrial land is expensive, as in Navi Mumbai. Some authorities have recently relaxed these ratios. The underlying norms were still not designed with data centres in mind.

10.4 On Data and Evidence

Participants confirmed the evidence gap identified in this note. Operators disclose little facility-level information on power or water efficiency. Global operators often report their Indian facilities together with their overseas portfolio. Some operators do publish sustainability reports, largely in response to investor and customer requirements.

Public authorities face a similar gap. District officials often have no means of assessing the water or power impact of a proposed facility. Relevant data exists across land, power and water departments, but it is neither shared nor consolidated. Participants noted that municipalities already hold water consumption data through the water bills operators pay. Collating this data could settle much of the debate on water use.

10.5 On Power and Cooling

Participants noted that grid and distribution upgrades will be needed regardless of data centre growth, since transport, industry and household cooling are also electrifying. Participants reported that renewable developers can supply up to about 80 per cent of a facility's power through a combination of solar, wind and storage. Maharashtra's round-the-clock renewable tariffs show that distribution companies can also supply green power directly. Participants saw scope for data centres to provide demand-response services to the grid.¹⁰ Only five states currently have demand-response regulations in place.

Participants discussed cleaner options for dedicated and backup power, including gas-based captive generation and small modular nuclear reactors. The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025 now permits limited private participation in nuclear power, under regulatory oversight. The Nuclear Energy Mission, announced in the Union Budget 2025–26, allocates ₹20,000 crore to the development and deployment of small modular reactors (PIB, 2025).

On water, industry participants stated that operators moved away from evaporative cooling many years ago. Operators guarantee their customers that services will remain available almost without interruption. A facility dependent on large volumes of water risks shutting down during a shortage, which would breach these guarantees. Many facilities now report water use at domestic levels. Participants noted that newer cooling technologies, such as direct-to-chip and immersion cooling, have not been adequately tested in Indian climatic conditions. Undersea data centres, now operating commercially in China, were raised as an alternative design that removes the need for freshwater cooling.

10.6 On Efficiency Benchmarks

Industry participants reported a PUE of about 1.45 for air-cooled facilities and about 1.3 for liquid-cooled facilities. A PUE of about 1.25 was considered a practical lower limit in Indian conditions. Operators described efficiency as a commercial necessity, since energy costs directly affect competitiveness. In the absence of absolute benchmarks, participants suggested relative benchmarking as a starting point. A facility would be measured against its own past performance or against its peers. Participants also noted that data centres could eventually be brought within carbon intensity targets, as several energy-intensive industries have been. The absence of incentives for exceeding efficiency norms was identified as a further gap.

¹⁰Demand response refers to arrangements under which large electricity consumers reduce or shift their use of grid power during periods of peak demand, usually in return for payment or a lower tariff. A data centre can do this by drawing on its own battery storage or by rescheduling flexible computing tasks. This helps the grid meet short peaks without building new power plants.

10.7 On National and State Roles

Participants discussed whether a national data centre policy is needed. Most approvals fall within state and municipal jurisdiction, so a national policy would not bind the states. It could still provide direction and carry persuasive value with state governments. Participants identified standardised reporting, research and development funding, and model provisions for municipal and power rules as its most useful content. The national green hydrogen mission was cited as a precedent, where state policies came first and a national mission followed. An alternative view favoured central model guidelines for states to adopt, rather than a single central policy. The sector spans about a dozen central ministries, which has made a single national policy difficult to anchor. The line ministry has so far been unconvinced that a national policy adds value.

11. Recommendations

Data centres and residential communities are likely to coexist, whether through planned location or through the growth of cities around existing facilities. The recommendations below aim to make that coexistence work for both. Dispersal and renewable capacity expansion remain complementary responses. Dispersal eases local resource stress, while renewable expansion meets aggregate demand. Neither is sufficient on its own. The recommendations draw on the analysis in this note and on the webinar discussion. They follow the life cycle of a data centre, from information and planning, through construction and operation, to efficiency and governance.

1. Regulate data centres for their external impact.

Regulation should focus on the effects of data centres on local resources, the environment and neighbouring communities. Service reliability and uptime are already enforced through customer contracts and do not need separate oversight. This keeps regulation targeted at the concerns examined in Section 8, without adding to an already extensive approval process (Section 10.3).

2. Consolidate location information at the district level.

Land, power and water data held by different departments should be brought together on a single accessible platform. District officials currently have no means of assessing the resource impact of a proposed facility (Section 10.4). Investors face the same gap and often discover constraints after construction has begun. A consolidated platform would support better decisions by both.

3. Introduce standardised reporting on power, water and noise.

A common reporting format should be introduced, voluntary at first and mandatory over time. As an immediate step, municipalities should collate the water consumption data they already hold through operators' water bills. The absence of facility-level data is the central evidence gap identified in this note (Section 10.4). Reporting would allow concerns to be assessed on evidence. It would also provide the baseline for efficiency targets (Recommendation 12).

4. Base location policy on the carrying capacity of an area.

State location policies should assess whether an area's water, power and infrastructure can sustain a data centre, rather than rely on investment considerations alone. Water stress is local rather than national (Section 8.3). A carrying-capacity test would steer facilities away from already-stressed sources and towards areas better able to host them. This would help investors choose viable locations early, and give policymakers a clear basis for approving or declining proposals.

5. Adopt a two-track approach to data centre location.

Large hyperscale campuses should be located in dedicated digital infrastructure zones, designated in state master plans with dedicated power, water and fibre. These facilities draw the most power and water, and their scale makes them the hardest to integrate into residential neighbourhoods. Smaller facilities will continue to operate within or near residential areas, since many services depend on proximity to users (Section 10.1). Policy must plan for their presence rather than resist it. These facilities should meet clear norms on setback, noise and backup power, set out in Recommendation 6. Where housing is later permitted near an existing facility, the same norms should apply to the new development. Coexistence can arise from the growth of cities as much as from the location of data centres (Section 10.2).

6. Set clear norms for data centres in residential areas.

Facilities within or near residential areas should maintain a minimum setback distance from homes, as several other jurisdictions already require. Norms should also govern the placement of generator exhaust outlets, and existing noise standards should be enforced. Indian regulation currently addresses setback only indirectly (Section 8.4). Noise standards exist but are weakly enforced (Section 8.1). Generator emissions close to homes were identified as a specific concern (Section 10.2). Clear norms would allow data centres and residents to coexist with confidence.

7. Add a dedicated data centre chapter to the National Building Code.

The chapter should set norms suited to data centres, including parking, occupancy and power infrastructure. Municipal norms written for IT and commercial buildings currently apply without adjustment, as the parking example shows (Section 10.3). The National Building Code already guides state and municipal building rules. A single chapter would therefore standardise practice across states.

8. Provide a single window for land, water and power approvals.

Approvals should be coordinated through one window at the state level, with clear responsibility for compliance after construction. A single facility may need 40 to 48 approvals across many bodies (Section 10.3). Post-construction obligations are few, even where the operator differs from the developer. A single window would reduce delay while keeping existing safeguards in place.

9. Enable cleaner backup and dedicated power.

Policy should support battery storage and gas-based generation as alternatives to diesel generators. In dedicated digital infrastructure zones (Recommendation 5), small modular nuclear reactors could in time provide dedicated supply. The SHANTI Act, 2025 now permits limited private participation in nuclear power, and the Nuclear Energy Mission supports the development of small modular reactors (PIB, 2025). Cleaner backup would reduce generator emissions near homes. Dedicated supply would ease pressure on the local grid.

10. Frame demand-response regulations and green tariffs for data centre loads.

States should issue demand-response regulations, and distribution companies should offer round-the-clock renewable tariffs to data centres. Only five states currently have demand-response regulations (Section 10.5). Data centres could then help the grid meet peak demand. Green tariffs would give operators a reliable route to renewable power without relying solely on open access.

11. Draw cooling water from treated, non-potable sources.

Data centre parks should be connected to treated wastewater networks. The deemed distribution licence model already used for power in data centre parks should be extended to water (Section 3). Water is the most significant local concern identified in this note (Section 8.3). Replicable models already exist, and existing reuse targets for bulk water users provide a regulatory basis (Section 4.5).

12. Make efficiency standards mandatory, with incentives for exceeding them.

The metrics defined by the Bureau of Indian Standards should be made mandatory through a Quality Control Order. Targets should be facility-specific reductions, modelled on the Perform, Achieve and Trade scheme. A higher voluntary tier should carry incentives, such as faster approvals or lower tariffs. India has defined efficiency metrics but set no targets (Section 9). Participants also noted the absence of any reward for exceeding norms (Section 10.6). Relative targets avoid the difficulty of setting a single absolute benchmark across varied Indian climates.

13. Fund research on cooling technologies suited to Indian conditions.

Research funding should test water-efficient cooling technologies in India's hot and humid climates. It should also explore alternative designs, such as undersea facilities. The performance of newer cooling technologies in Indian conditions remains untested (Section 10.5). Evidence from this research would inform future efficiency and water standards.

14. Issue a national framework as model guidelines for states.

The Centre should issue non-binding model guidelines covering reporting formats, municipal and power norms, and research priorities. Most approvals sit with states and municipalities, and a binding national policy has proved difficult to anchor across ministries (Section 10.7). Model guidelines would reduce variation across states while respecting their jurisdiction. The national green hydrogen mission offers a precedent.

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