



# India's AI-Driven DC Surge

Noah Analytics

2025/08/05



# CONTENTS

- 01 Market Spine
- 02 Hyperscaler Shock
- 03 Energy Chokepoint
- 04 AI-Ready Reality
- 05 Resource Friction



# 01

Market Spine



**CHAPTER**

## Central trajectory locked

01

CBRE, ICRA and Colliers triangulate on 4.5 GW national stock by 2030, implying 2.9 GW must be freshly commissioned inside six years—equal to adding one new 500 MW hyperscaler campus every year.

## Hyperscaler step-change

02

Single announcements like Google's Visakhapatnam hub instantly shift the national tally by 15-20 %; execution of 2-3 such gigaprojects determines whether the spine lands at 4.5 GW or slips to the low 2.9 GW band.

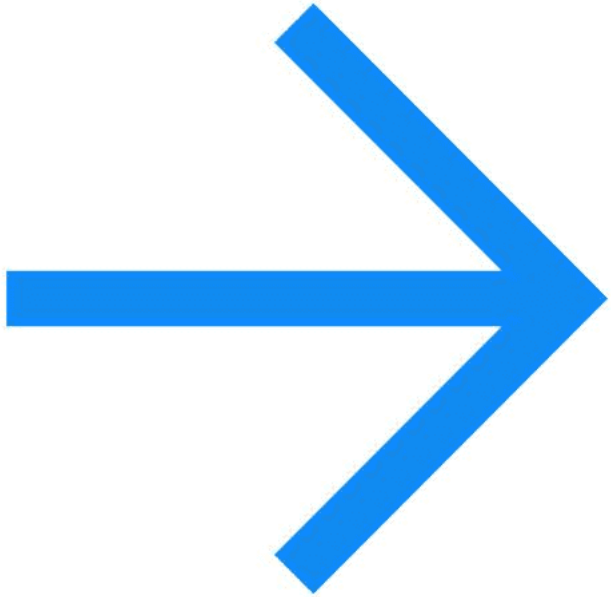
# From 1.6 GW to 4.5 GW by 2030

## Third-party steady filler

03

Beyond marquee names, 300 MW per year of colocation and enterprise builds must still reach commercial operation; without this baseline the central forecast unravels even if hyperscalers deliver on time.

# Scenario Bands Shape Risk



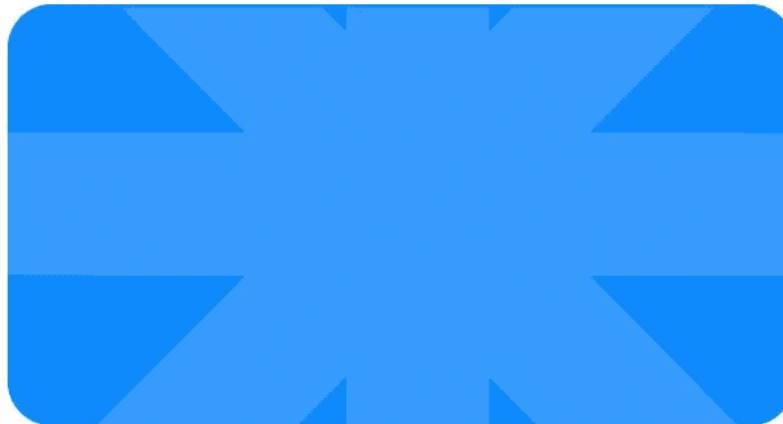
## Energy swing factor

Each 1 GW deviation equals ~9 TWh annual consumption at 1.5 PUE; choosing low vs high case changes grid planning by the output of two 1 GW coal plants, so PPAs must be signed before steel hits the ground.



## Financing already aligns

USD 20-25 bn capital commitments map to the high 6.4 GW scenario, yet money cannot convert electrons without transmission reservations—making energy, not equity, the binding constraint for investors.



# 02

Hyperscaler Shock



**CHAPTER**



# Single Campus Moves National Needle

## 01 Quantum leap in one MOU

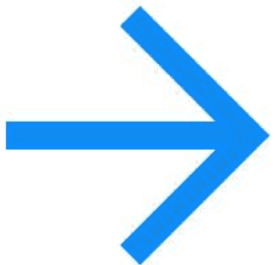
Google's \$15 bn Visakhapatnam pledge delivers >1 GW on a single site—comparable to India's entire 2024 third-party stock—so a solitary groundbreaking ceremony can reprice national supply-demand models overnight.

## 02 CLS timeline is the swing vote

Cable-landing station completion by 2027 unlocks subsea latency promises; a six-month slip pushes energisation into 2029 and shoves 15 % of India's required capacity into the next decade.

## 03 Concentration risk magnified

Because one campus equals >15 % of national additions, any land, environmental or grid delay produces an outsized shortfall, forcing operators to fall back on costlier backup power or miss AI demand windows.



# Concentration Risk in Three Hubs



## 80 % of MW in 300 km radius

Mumbai, Navi Mumbai, Visakhapatnam and Chennai cluster attract four-fifths of announced capacity, creating latency advantages but stacking water, transmission and permit queues that can stall multiple projects simultaneously.

## Cascade failure scenario

A single coastal environmental stay or submarine cable fault can idle gigawatts across neighbouring campuses, making portfolio diversification into Tier-2 cities a prudent hedge for hyperscaler supply chains.



# 03

Energy Chokepoint



**CHAPTER**



# Capital Is Plenty, Electrons Aren't



## Finance queue vs grid queue

USD 20-25 bn of declared equity and debt covers the high-case 6.4 GW build, yet Maharashtra and Andhra Pradesh transmission offices already show 18-month interconnection backlogs—money cannot buy megawatts without wires.



## Firming scarcity premium

24x7 AI loads require RE plus 4-6 hour storage; only 2 GW of such firming capacity is contracted today, creating a seller's market where storage suppliers can demand 20-year take-or-pay deals at premium tariffs.



## Stranded asset warning

Shells completed without PPAs risk becoming dark MT structures, burning OPEX on diesel gensets while awaiting grid upgrades—eroding IRR by 300-500 bps versus projects that locked in long-tenor renewable offtake.





## Doubling data-centre load

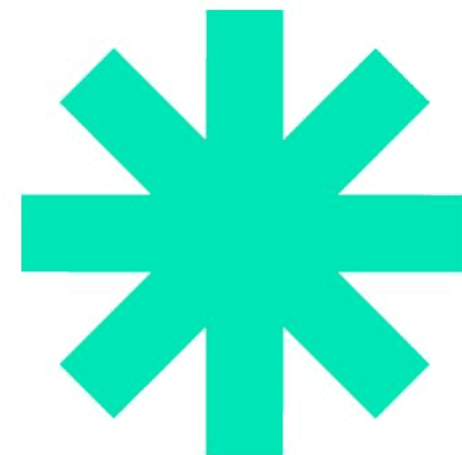
Central 40 TWh addition equals India's current aluminium sector consumption; state utilities must carve out this slice from already tight reserve margins, requiring advance procurement of firmed renewables and transmission upgrades.

**25–55 TWh  
New Demand  
Looms**



## Peak vs energy challenge

AI training racks draw 50 kW steady for weeks, flattening traditional IT diurnal curves and pushing DISCOMs to re-rate transformers; planning on energy (TWh) alone misses the 2–3 GW new simultaneous peak by 2030.





01

## Virtual PPA unlocks off-site firming

New regulatory template lets hyperscalers bank renewable electrons remotely and dispatch via grid, bypassing land-scarce coastal hubs while still meeting 24x7 carbon-free targets—turning firming into a tradable instrument.

## VPPA Framework as De-Risker

02

## First-mover interconnection priority

State load dispatch rules grant transmission access to projects with signed VPPAs; early movers effectively jump the queue, shaving 12-18 months off energisation schedules and securing ROI before tariff escalation.

# 04

AI-Ready Reality



**CHAPTER**

# Gross MW $\neq$ AI Compute

**1**

GPU gap  
hollows  
megawatts

A 100 MW legacy hall delivers 5 kW/rack air-cooled; retrofitting to 50 kW GPU racks requires liquid cooling, bus-way up-rates and floor loading checks—without these only 30 % of nameplate power converts to sellable AI compute.



**2**

Thermal  
envelope is  
the ceiling

Chip vendors quote 35 °C inlet for direct-to-chip loops; if chilled-water capacity tops out at 25 °C, operators must throttle GPUs or face service-level penalties—turning marginal cooling Capex into revenue-limiting bottleneck.



**3**

Design once,  
monetise fast

Specifying AI-ready racks, manifolds and CDUs during shell construction adds <5 % to Capex but accelerates tenant fit-out by six months, capturing premium tariffs before GPU supply gluts normalize pricing.





# 05

Resource Friction



**CHAPTER**

# Water Budgets Can Halt Builds

Visakhapatnam and Mumbai corporations received show-cause orders for untreated sewage discharge; any new data-centre demanding millions of litres faces heightened environmental scrutiny that can stall commissioning by 12-24 months. \*

Closed-loop cooling cuts fresh-water draw by 90 % and is fast becoming a state-level gating condition; projects without recycled-water MOUs risk permit rejection regardless of land or power clearances. \*

A 10 MLD co-located desal plant adds ~USD 25m but can unlock 200 MW of AI capacity; compared with 18-month delay penalties and diesel OPEX, payback falls below three years under current tariff structures. \*

NGT notices already flying



Closed-loop as licence to operate



Desal capex beats delay cost

## States compete on acreage

Andhra Pradesh and Tamil Nadu offer 200-acre data-park parcels with single-window clearance; land scarcity has flipped to buyer's market, shifting negotiation leverage to operators who can guarantee 24x7 firm power and recycled-water plans.

## Resource budgets replace land price

Due-diligence checklists now prioritise water-allocation letters and 132 kV substation bays over land cost; a cheap plot without 50 MLD water reserve or transmission headroom is effectively unbankable.



# Land Is Not the Constraint



# 06

Strategic Plays



**CHAPTER**

# Aggressive: Anchor East-Coast GW

## Lock in CLS and PPA today

Secure priority cable-landing slots and 500 MW RE+storage VPPAs before 2026; first-mover position allows 2027 energisation that captures hyperscaler lease-up at premium tariffs, targeting 18-20 % IRR if schedule holds.

ONE

## Concentration risk is extreme

A single permitting slip can idle 20 % of national pipeline; mitigate via phased capital calls tied to land transfer, environmental clearance and grid-connection certificates, limiting equity at risk per milestone.

TWO

## Exit via tenancy syndication

Pre-negotiate sale of 49 % stake to anchor tenant once 50 % occupancy is achieved, recycling capital into next corridor while retaining O&M fees—turning execution risk into monetisable platform value.

THREE

# Balanced: Milestone-Linked Tranches



01

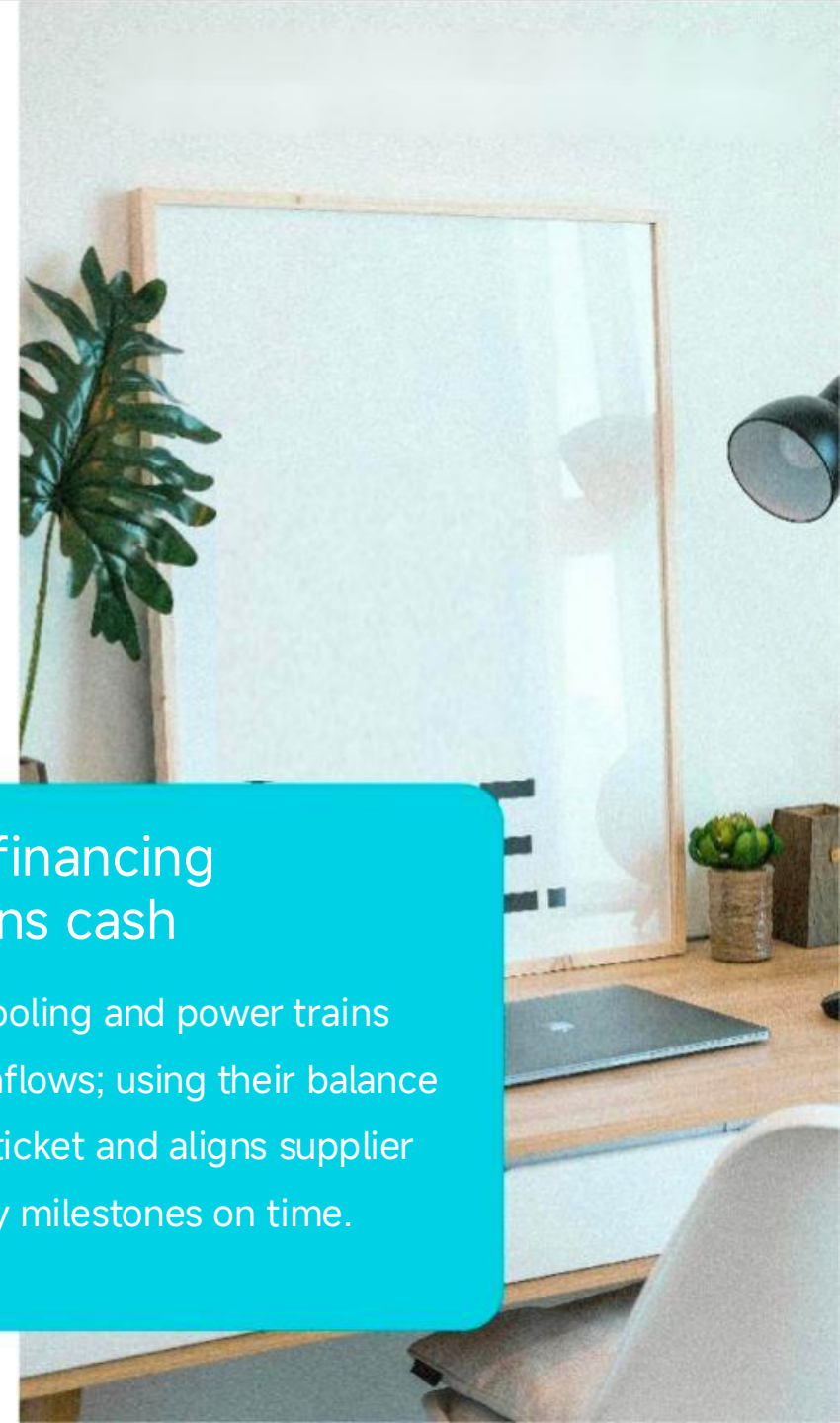
PPA as drawdown trigger

Structure 100-300 MW acquisitions where equity is injected only after long-tenor RE+storage PPA and transmission reservation are demonstrated; this caps downside while preserving upside to sell or refinance once commissioning is proven.

02

Vendor financing cushions cash

OEMs offer 70 % LTV on cooling and power trains repayable from tenant cashflows; using their balance sheet reduces your equity ticket and aligns supplier incentives to hit GPU-ready milestones on time.



# Defensive: Stick to AI-Ready Retrofits



Upgrade legacy halls with liquid-cooling manifolds and 50 kW racks; Capex 30 % of greenfield yet yields 40 % higher kW tariffs from GPU tenants, protecting cashflow while avoiding speculative land exposure.

## Demand AI-readiness clauses

Insert GPU delivery schedules and thermal-envelope acceptance into colocation contracts; if tenant hardware slips, you keep progress payments and can re-market the slot at prevailing AI premiums—limiting stranded inventory risk.



# 07

Call to Action



## CHAPTER



01

## Make PPA the investment gate

Board memos should mandate executed RE+storage offtake as the non-negotiable threshold for any >50 MW allocation; without it, commissioning windows stretch beyond 2028 and IRR erosion exceeds 400 bps under high-demand scenarios.

## Secure Long-Tenor PPAs First

02

## Procure at scale today

Form a 1 GW procurement vehicle now to lock 15-year fixed tariffs before storage cost inflation and interconnection queues harden; aggregating demand gives bargaining power and secures priority slots in state transmission roadmaps.

# Track CLS, GPU, Water Milestones



## Build a live risk dashboard

Plot quarterly commissioned MW, cable-landing RFS dates, GPU hall start-ups and site water permits; colour-code deviations >90 days and reprice equity IRR automatically—turning project management into a tradable risk signal.

## Tie funding to lead indicators

Link subsequent equity drawdowns to dashboard milestones; if CLS or environmental clearance slips, funding pauses and force-majeure discussions start early, protecting capital while still preserving contractor relationships.

## Publish tracker to investors

Sharing the dashboard with lenders and tenants builds credibility and can lower cost of debt by 25-50 bps—transparency converts execution risk into a measurable variable rather than an opaque equity discount.

## 300 MW per year is the floor

To meet the central 4.5 GW target India must commission at least 300 MW every year through FY28; missing even one year pushes supply shortfall into the high-demand 6.4 GW band, triggering tariff spikes and sovereign cloud delays.



## Window Closes After FY28

### Late entrants face scarcity pricing

After 2028, surplus turbine and transformer inventory will be exhausted; late projects will pay spot premiums for equipment and interconnection, turning today's 12 % IRR into sub-8 % returns even if demand materialises.

THANK  
YOU.



2025/08/05

Noah Analytics