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BESS Intelligence — India vs the China wall

CATL's stacked containers, Cat-1/Cat-2 OEM landscape, India Inc's cell retreat, EMS control layer, CEA/MoP rulebook and the honest readiness verdict.

22% CATL global BESS cell share (H1) Hithium 10.2% · EVE 9% · BYD 6.7%	**~10 yrs away** India cell self-sufficiency 226 GWh announced through 2035, negligible operating	**9 MWh** Largest single container CATL TENER Stack, two-in-one under 36 t/unit	**Apr 2027** CEA BESS safety framework Fire suppression, thermal runaway, BMS mandates

01 · Technology frontier — CATL TENER Stack & the density race

CATL's TENER Stack is a 9 MWh grid-scale system launched at ees Europe (May 2025) — a stacked, two-in-one configuration of half-height units, each under 36 tonnes, engineered specifically around global road-transport weight limits. It builds on the 6.25 MWh TENER platform and its five-year zero-degradation claim, lifting energy per container footprint by ~50%.

The cell race has moved past 314Ah: 587Ah-class ultra-large cells are the industry's primary development focus, though integrators remain in wait-and-see mode on which format standardises. Every jump in cell size compresses $/kWh at system level — and widens the technology gap for anyone outside China's supply chain.

Container energy density evolution (MWh per 20-ft class footprint): 280Ah era 3.44MWh · 314Ah (current India imports) 5.015MWh · CATL TENER 6.25MWh · TENER Stack (2-in-1) 9.0MWh

02 · Who's who — Cat-1 vs Cat-2 cell/system OEMs & India availability

Cat-1 here = gigafactory-scale, bankability-grade OEMs that clear lender/insurer diligence in Indian utility tenders. Cat-2 = credible challengers that win on price or niche but need wrapping (LDs, insurance, balance-sheet support) to be financed. Availability in India is shaped less by the OEM's appetite and more by Beijing's export-control posture and India's trusted-vendor screening.

OEM	Origin	Category	In India?	Notes
CATL	China	Cat-1	Imports only	Global #1 (22% H1 share). In component-supply talks with Reliance for Jamnagar assembly; no cell tech transfer
BYD	China	Cat-1	Restricted	6.7% global share. FDI screening (Press Note 3) blocks manufacturing entry; product imports only
EVE Energy	China	Cat-1	Active	9% global share. Regular cell/DC-block supplier into Indian integrators
Hithium	China	Cat-1	Active	10.2% global share. Reliance licensing deal collapsed under China's export controls; still ships product
Gotion High-Tech	China	Cat-1/Cat-2 border	Active	VW-backed. Supplies cells & containers into Indian C&I and utility tenders; aggressive pricing
Narada Power	China	Cat-2	Active	Long telecom/UPS legacy in India; grid-scale LFP containers now offered with local service
RJE Tech (Rongjie Energy)	China	Cat-2 rising	MoUs signed	3–4 GWh LFP cell supply pact with Pace Digitek's Lineage Power (2027); JSW Energy MoU for ~5 GWh of ESS on RJE 314Ah & 588Ah cells (5 / 6.26 MWh systems)
REPT Battero / Great Power	China	Cat-2	Selective	Price challengers appearing in Indian RFQs; bankability wrapping usually required

OEM	Origin	Category	In India?	Notes
Samsung SDI / LG ES	Korea	Cat-1 (non-China)	Limited	NMC heritage, limited grid LFP; relevant where 'non-Chinese cell' is specified
Tesla / Fluence / Wärtsilä	US/EU	Cat-1 integrators	Selective	System + EMS layer on top of (mostly Chinese) cells; strong software, premium pricing

Global BESS cell shipment share — H1 2026 (Benchmark Minerals): CATL 22 · Hithium 10.2 · EVE 9 · BYD 6.7 · Others 52.1

03 · India Inc's cell retreat — JSW stalls, Reliance pivots to sodium-ion

JSW Group has put its proposed 50 GWh Odisha cell plant on hold — leadership says LFP cell technology is 'tightly guarded by China and unavailable elsewhere', pushing the group downstream into cell-to-pack assembly for BESS and EVs. JSW has meanwhile signed an MoU with RJE Tech (Rongjie Energy) for 5 MWh and 6.26 MWh ESS systems built on RJE's 314Ah and 588Ah LFP cells — buying systems while cell manufacturing waits.

Reliance's licensing deal with Hithium collapsed after Beijing tightened export controls on sensitive clean-energy technologies (Jan 2026). Reliance has since pivoted from cell synthesis to containerised BESS assembly at Jamnagar, procuring components from CATL and others — while accelerating sodium-ion work: no Chinese LFP licence needed, domestic soda-ash feedstock, and better tolerance of Indian ambient temperatures than NMC.

The pattern repeats across India Inc (Adani included): retreat from upstream cell chemistry to system integration, because non-Chinese technology routes are costlier and slower than PLI milestones assumed.

Why the China wall is real

• LFP cell IP, precursor know-how and manufacturing equipment are export-controlled by Beijing

• India imports effectively 100% of grid-scale cells; graphite/anode chain is equally China-dominated

• VGF-supported projects need ≥20% domestic content — met today via containers, EMS, PCS & BoP, not cells

• Developers optimise duty via AIFTA routes (Malaysia/Indonesia) — a workaround, not a fix

• Every large-format cell generation (314Ah → 587Ah) resets the catch-up clock for Indian fabs

04 · Indian champions — who is actually building (Pace Digitek, AmpereHour, Replus & co.)

Company	What they do	Proof points
Pace Digitek / Lineage Power	Integrated BESS manufacturing + EPC + O&M	NTPC Nabinagar 200 MW/400 MWh EPC; SECI 600 MW/1,200 MWh (~■1,159 cr); 5 GWh line by Oct-2026, scaling to 10 GWh; 4 GWh LFP cell framework with RJE Tech (2027); BESS MoU with Bondada Renewable
AmpereHour Energy	AI-driven, hardware-agnostic EMS (ELINA) + turnkey systems	Multi-OEM real-time monitoring, predictive dispatch; one of few Indian EMS stacks running utility assets
Replus Engitech	Pune-based BESS OEM — packs, containers, EMS	C&I and utility containers with indigenous BMS/EMS integration
Neuron Energy / Feston SEV	Container-level assembly plants	Early movers in localising the container & pack layer
Waaree ESS / Exicom	Storage systems, telecom & EV charging heritage	Leveraging existing power-electronics channels into grid BESS
Delectrik Systems	Indian VRFB (vanadium flow) OEM	India's first utility-scale flow battery — 100 MWh / 16.7 MW at Khavda for NTPC REL (with Bondada, 2027); 3 MWh NTPC pilot at Greater Noida
Bondada Engineering	EPC & storage deployment partner	Partner on NTPC REL's 100 MWh Khavda VRFB; BESS MoU with Lineage Power (Pace Digitek)

05 · The EMS layer — who controls the brain (and why origin matters)

The EMS decides dispatch, SoC strategy, curtailment response and market bidding — it sees every telemetry point in the plant. That makes EMS origin a cybersecurity and sovereignty question, not just a software choice. CEA's cyber regime effectively pushes critical-grid operators toward auditable, India-resident control layers.

EMS	Owner	Origin	Indian origin?	Notes
ELINA	AmpereHour Energy	India	YES	Hardware-agnostic, AI dispatch, multi-OEM fleets
Replus EMS/BMS stack	Replus Engitech	India	YES	Integrated with own containers
Sheru	Sheru (software)	India	YES	Cloud VPP/storage aggregation layer
Mosaic / Fluence OS	Fluence	US	No	Bid optimisation heritage (AES/Siemens)
GEMS	Wärtsilä	Finland	No	Utility-scale fleet controller
Autobidder	Tesla	US	No	Market bidding, Megapack-locked
Chinese OEM-bundled EMS	CATL/Hithium/Gotion etc.	China	No	Ships 'free' with containers — the exact layer CEA cyber rules scrutinise

06 · CEA, MoP & cybersecurity — the rulebook is hardening

2021 — CEA Cyber Security in Power Sector Guidelines. ISMS baseline, CISO mandates, incident reporting for grid entities

2022 — MoP trusted-vendor order. Grid-connected equipment from 'prior-reference' countries needs testing/approval — aimed squarely at Chinese power electronics

2024 — CEA Cyber Security Regulations. CSIRT-Power, ISO-27001 alignment, data residency, no remote firmware/configuration access from outside India

2026 — GRID India grid-forming directive. BESS >50 MW must provide grid-forming (GFM) capability — frequency/voltage support, not just grid-following

Apr 2027 — CEA BESS safety framework in force. Fire suppression, thermal-runaway management and BMS requirements for all new grid BESS

Net effect: imported cells are tolerated, but imported control layers (BMS/EMS with offshore telemetry) are increasingly not. Compliance-ready, India-resident EMS is becoming a tender differentiator — which is precisely where Indian software players can win before Indian cells exist.

07 · Honest readiness verdict — is the Indian ecosystem ready?

Container fabrication & system integration: 8/10 — Pace Digitek, Replus, Neuron scaling now

EMS / software control layer: 6/10 — ELINA & co. credible; needs utility-scale references

PCS / power electronics: 5/10 — Assembly exists; semiconductors imported

Cells: 1/10 — No grid-scale LFP cell production; tech access blocked

Upstream minerals & precursors: 2/10 — NCMM & recycling schemes are seeds, not supply

Verdict: India is execution-ready and cell-deficient. The 2026–2030 play is unapologetically import-cells → localise-everything-else, with sodium-ion and recycling as the sovereign hedges. Anyone underwriting 'domestic cells by 2028' into a bid is taking technology-transfer risk that JSW and Reliance have already repriced.

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• POWERGRID Invites Bids for 265 MW/530 MWh BESS Project in Haryana (Energetica India Magazine)

• Why India's BESS growth story depends on delivering bankable projects (EY)

• SECI Invites Bids for 100 MWh Standalone Energy Storage (mvapulse.com)

• 5 Battery and Energy Storage Stocks India 2026: Roadmaps (Univest)

• India’s energy storage push gathers momentum, but tariff viability and financing hurdles loom large (Institute for Energy Economics and Financial Analysis (IEEFA))

- From 2 To 4 Hours-The Quite Shift In India's Energy Storage Tenders And Its Impact (Saur Energy)
- GUVNL discovers INR 2.32 lakh/MW/month tariff in 450 MW/900 MWh BESS tender (pv magazine India)
- CATL Debuts World's First Field-Validated Sodium-Ion BESS, Bringing Sodium Storage to Commercial Reality (■■■■·CATL)
- Inside the container: looking at CATL’s sodium-ion Tener’s specs (Energy-Storage.News)
- Behind CATL’s ‘zero degradation’ BESS technology (Energy-Storage.News)