May 2026

Institute for Energy Economics and Financial Analysis

JMK Research & Analytics

Viability of standalone battery energy storage tariffs discovered in 2025

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Key findings

India's clean energy transition is increasingly becoming dependent on large-scale storage deployment, with procurement shifting toward standalone energy storage system (ESS) tenders that contract storage capacity without being tied to a specific renewable generation asset. These standalone tenders made up more than 71% of the total capacity tendered in India in 2025, with standalone battery energy storage system (BESS) projects accounting for 60% of this capacity.

A total of 10.4GW of standalone BESS capacity was allocated in 2025, with the 2-hour, 2-cycle configuration accounting for the bulk of this capacity.

Tariff viability of the 2025 standalone BESS bids, however, remains a concern. Standalone BESS tariffs fell, with the lowest tariffs discovered reaching INR1.48 lakh/megawatt/month (USD1,576/MW/month) for the 2-hour system. Nearly 75% of allocated 2-hour BESS capacity falls into the at-risk viability category, indicating a major gap between discovered tariffs and actual project costs.

Execution risks can constrain BESS project realisation. Financing conditions remain stringent, while declining tariffs, rising battery input costs, and heavy reliance on China across key segments of battery supply chain are expected to create execution challenges.

There's a need for reforms, such as cost-reflective tariff floors, stricter eligibility criteria, and stronger payment security mechanisms. Over the longer term, domestic manufacturing, critical mineral partnerships, and a diversified technology mix will be crucial for building a resilient BESS ecosystem.

Executive summary

India's battery energy storage system (BESS) segment is entering a critical phase as the country's clean energy transition becomes increasingly dependent on large-scale storage deployment. India's cumulative tendered energy storage capacity has grown from 6.8 gigawatts (GW) in 2018 to 90.7GW by 2025. Standalone energy storage system (ESS) tenders, that contract storage capacity without being tied to a specific renewable generation asset, represented more than 71% of the total capacity tendered in 2025, with standalone BESS projects accounting for 60% of this.

Of the 10.4GW of standalone BESS actually allocated, the 2-hour, 2-cycle configuration with a 12-year contract tenor was the most prevalent, representing 57% of the total allocated capacity. The cost of storage, or tariffs, paid by procurers (distribution companies, power generation companies or central agencies like the Solar Energy Corporation of India Ltd [SECI]) to BESS developers declined sharply with the lowest discovered tariffs reaching INR1.48 lakh/megawatt/month (USD1,576/MW/month) for 2-hour systems, and INR2.85 lakh/MW/month (USD3,035/MW/month) for 4-hour systems.

Despite strong procurement momentum, the economic viability of the 2025 standalone BESS bids remains a key concern. Against a benchmark tariff of INR2.3 lakh/MW/month (USD2,449/MW/month) for the 2-hour, 2-cycle configuration, nearly 75% of allocated capacity in this segment falls within the risky category. In contrast, the 4-hour segment appears relatively more viable, with more than two-third of the allocated capacity aligned with the benchmark tariff. In the second half of 2025, tariff reduction accelerated with several large-scale tenders awarded at very low prices, suggesting speculative bidding behaviour.

Execution risks further constrain project realisation. Between 2022 and 2025, tariffs declined by over 71%, far exceeding the 36% reduction in battery pack prices over the same period, indicating a growing divergence between tariffs and the underlying cost structures. During 2025, prices for lithium carbonate, a key input in lithium iron phosphate (LFP) cell manufacturing, in China increased sharply; and now the phased removal of export rebates from April 2026 is expected to further increase landed battery costs in India. Developer capability remains uneven, with only 46.3% of allocated capacity awarded to players with standalone BESS execution capabilities. The financing conditions also remain conservative as lenders typically expect internal rates of return (IRR) in the range of 15–20%.

Execution risks in standalone BESS are expected to have broader implications for the sector. Implementation delays in the range of nine to 18 months may persist due to challenges related to financial closure, procurement and commissioning. Cost pressures at lower tariffs could also lead to compromised asset quality, system reliability and safety. These challenges may ultimately constrain effective renewable energy integration in India's energy mix.

Revisiting procurement frameworks will be critical to address emerging risks in the standalone BESS segment. This would include introducing cost-reflective tariff floors, tightening eligibility criteria, and

revisiting the auction framework to ensure tariffs remain aligned with execution realities. Alongside this, a standardised payment security mechanism will be necessary to improve project bankability. In parallel, domestic manufacturing ecosystem and local supply chains will develop gradually. Introduction of the Approved List of Battery Manufacturers (ALBM), acceleration of cell manufacturing under the Production Linked Incentive (PLI) scheme, and the National Critical Mineral Mission (NCMM), will be essential to support this transition and reduce import dependence over time.

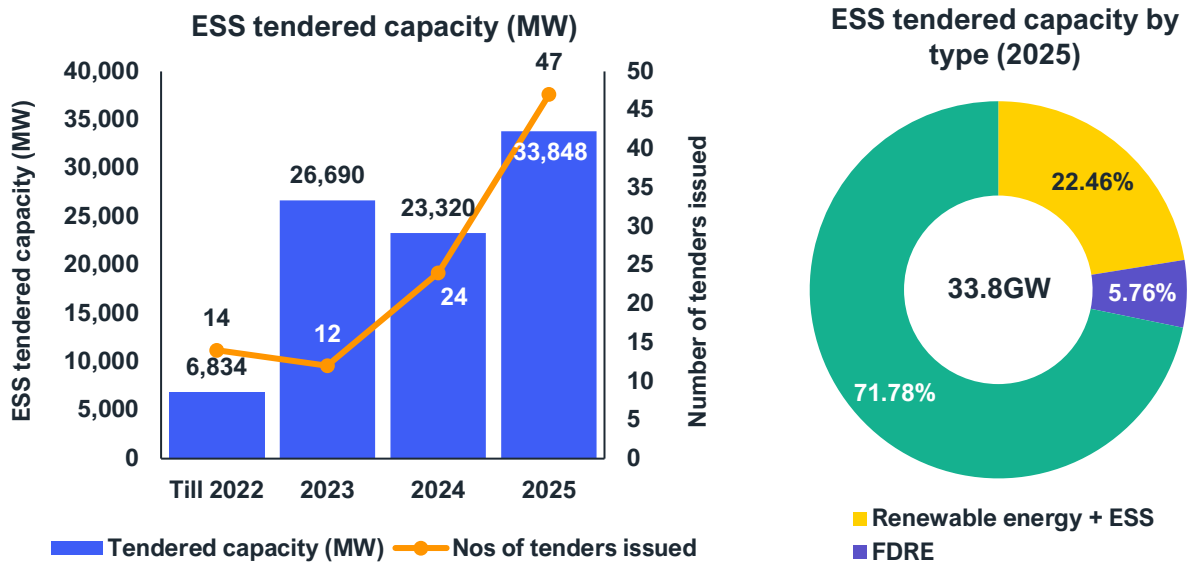
India's BESS sector is transitioning from the tendering and pipeline stage to execution and on-ground project deployment. Near-term execution challenges could result in delays or cancellations for a portion of the allocated capacity. In the near term, supply chains will remain dependent on lithium carbonate imports from China, with a gradual diversification of sourcing and a shift towards a more diverse technology mix taking place. Ultimately, the pace and scale of energy storage deployment will determine India's trajectory to achieve its 500GW renewable energy target by 2030.

Background

Energy storage procurement in India has evolved significantly, transitioning from limited pilot projects to grid-scale competitive tenders. The cumulative energy storage systems (ESS) tendered capacity, comprising projects that contract storage capacity without being tied to a specific renewable generation asset, increased from around 6.8 gigawatts (GW) in 2018 to approximately 90.7GW by 2025, with a large share of the growth occurring in the past three years. Currently, ESS deployment in India, across both grid scale and commercial and industrial (C&I) segments, is broadly emerging under three configurations. These include:

- **Renewable energy + ESS*:*** Here, the storage is paired with renewable generation and is typically owned or contracted by renewable developers to store excess generation and dispatch it during periods of higher demand. The size of individual components — generation and storage — are defined separately, based on specific system configuration.
- **Firm and dispatchable renewable energy (FDRE):** These projects deliver renewable power on a firm and dispatchable basis, with bidding and offtake structured around the contracted delivery profile rather than installed capacity. FDRE includes configurations such as round-the-clock (RTC), peak power, and demand-following supply.
- **Standalone ESS*:*** These storage systems are deployed independently of generation assets and owned by utilities, grid operators, or third-party providers. They primarily support grid operations through services such as peak shaving, load shifting, frequency regulation, and energy arbitrage, while also facilitating renewable energy integration.

Figure 1: ESS tenders issuance trends



Source: Tendering authorities, JMK Research

In 2025, procurement activity showed a marked acceleration towards standalone ESS, making up over 71% of total ESS tender issuance during the year (Figure 1). Standalone BESS made up around 60% of this tendered standalone ESS capacity, emerging as the largest energy storage category in India in 2025 based on issued tenders. The remaining 40% consisted of standalone pumped hydro storage (PHS) tenders. This growth coincided with declining battery prices and supportive policy measures such as the introduction and expansion of viability gap funding (VGF) for standalone BESS projects.

This report focuses on the tariff outcomes observed in standalone BESS tenders in India. It examines the factors influencing tariff discovery, evaluates the economic viability of the discovered tariffs under current market conditions, and discusses key considerations shaping the near-term outlook for standalone energy storage deployment.

Standalone ESS auctions and tariffs in 2025

During 2025, 18 tenders totalling about 10.8GW of standalone BESS capacity were auctioned, of which nearly 10.4GW was allocated, reflecting an allotment rate of around 97%. Of the allocated capacity, the majority, around 86%, was for the 2-hour storage duration system, while the remainder was for the 4-hour storage duration system. The lowest tariffs discovered for standalone ESS tenders during the year were INR1.48 lakh/megawatt/month (USD1,575.85/MW/month) and INR2.85 lakhs/MW/month (USD3,034.57/MW/month) for the 2-hour and 4-hour storage durations[1], respectively.

Standalone BESS tenders allocated in 2025 also varied in commercial design and contract structure. They can be further classified based on cycling profile[2] (one cycle or two cycles), project tenure (12-20 years) and charging responsibility (whether under the developer's scope or not).

The key configurations observed across tenders are summarised in the table below:

Table 1: Classification of standalone BESS tenders auctioned in 2025

Storage duration	Cycles /day	Contract tenure (years)	Capacity allocated (MW)	% capacity VGF-supported	Lowest tariff
2-hour	2	12	5,890	91.5%	INR1.48 lakh/MW/month (USD1,575.85/MW/month)
	2	15	1,000	100%	INR1.775 lakh/MW/month (USD1,889.95/MW/month)

[1] Storage duration: Refers to the energy storage duration of the system at rated power output. A 2-hour system for instance, can discharge continuously at full rated capacity for two hours.
[2] Cycles: Denotes the number of complete charge–discharge cycles the system is contracted to deliver per day, where one cycle corresponds to the battery being charged from its minimum state of charge to its maximum and then discharged back.

	1	15	2,000	100%	INR1.66 lakh/MW/month (USD1,767.51/MW/month)
4-hour	1	12	375	100%	INR4.34 lakh/MW/month (USD4,621.44/MW/month)
	1	15 (developer-led charging)	250	100%	INR6.64/kilowatt-hour (USD0.07/kWh)
	1	15	500	100%	INR2.85 lakh/MW/month (USD3,034.57/MW/month)
	1	20	375	100%	INR3.59 lakh/MW/month (USD3,822/MW/month)

Source: Tendering authorities, JMK Research

The 2-hour, 2-cycle, 12-year configuration was the primary tender design type in 2025, accounting for 57% of the total allocated capacity. Overall, the 2-hour, 2-cycle tender configuration empowers the energy offtakers to address both morning and evening peak windows in India's emerging duck-curve type demand profile. Since mid-2025, the 4-hour segment has been increasingly gaining prominence, as its higher single-cycle energy throughput is well suited to meet evening peak demand requirements.

Standalone BESS tariff viability analysis

This section evaluates whether the lowest winning tariffs discovered in India's 2025 standalone BESS auctions are consistent with financially viable project delivery. Standalone BESS tariffs in India are driven by both technical configuration and financial parameters. Storage duration and cycling frequency are the key technical determinants for initial capacity requirements, degradation curve and augmentation costs. Moreover, other parameters such as battery prices and VGF support, among other things, also play a defining role in determining project economics.

JMK Research has estimated indicative benchmark tariffs for the three most common 2025 standalone tender BESS types based on system configuration (discharge duration and cycling) and contract tenure.

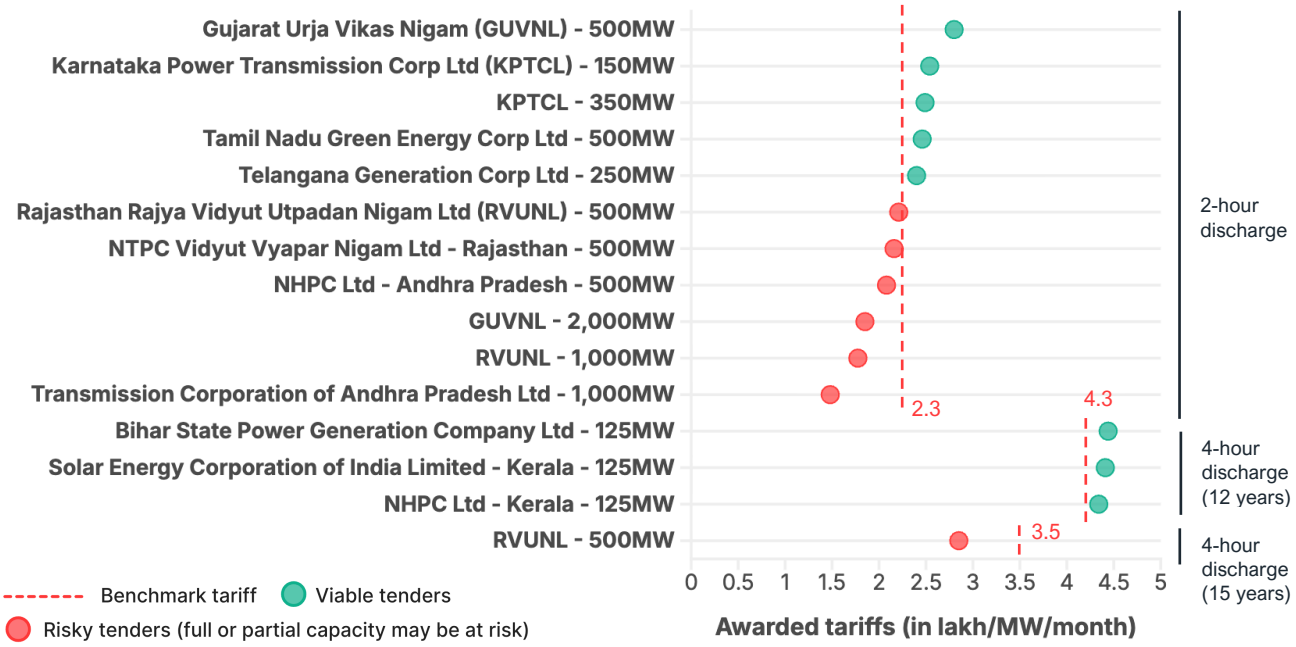
- **2-hour/2-cycle 12-year tenure**: INR2.3 lakh/MW/month (USD2,448.95/MW/month)
- **4-hour/1-cycle 12-year tenures:** INR4.3 lakh/MW/month (USD4,578.48/MW/month)
- **4-hour/1-cycle 15-year tenures or more:** INR3.5 lakh/MW/month (USD3,726.67/MW/month)

These are broad estimates and may vary depending on project-specific scope, including whether the land and power evacuation infrastructure responsibilities fall on the developer or the procurer, among other factors.

To assess tariff viability across standalone BESS category, the lowest winning bids are benchmarked against reference tariff levels derived through a combination of JMK Research analysis and

stakeholder consultation. Subsequently, auctions are classified based on their lowest discovered tariffs: 'Viable' (at or above benchmark) or 'risky' (below benchmark). Although classification is anchored to the lowest (L1) winning tariff of each auction, all other winning bids also consistently fall on the same side of the benchmark.

Figure 2: 2025 standalone BESS tenders — allocated tariffs vs viability benchmark



Source: JMK Research
Note: 1. Tender labels in the figure denote total tendered capacity; allocated capacity may differ.
2. Benchmark tariffs are based on BESS system capital expenditure (capex) of USD115/kWh (all-inclusive), an exchange rate of INR85 per USD; annual operations and maintenance (O&M) costs fixed at 1.5% of capex, a round-trip efficiency (RTE) of 90%, depth of discharge (DoD) of 80%, inverter losses of 5%, a salvage value of 5%, and no discounting of future cash flows.

Analysed against the auction classification framework described above, the outcomes in Figure 2 reveal several key trends in tariff viability:

- For 2-hour 2-cycle auctions, tariffs are heavily skewed below the benchmark with roughly 75% (5,165MW) of the total awarded capacity across the 12 auctions (6,890MW) falling in the risky category[3]. Viable outcomes are limited to early-stage, smaller procurements from five state-based standalone BESS auctions. These tenders originate from Karnataka, Tamil Nadu, Telangana, and Gujarat.
- The 4-hour, 1-cycle segment reflects a comparatively stronger viability profile than the 2-hour configuration. Of the four tenders in this segment included in the benchmark analysis in Figure 2

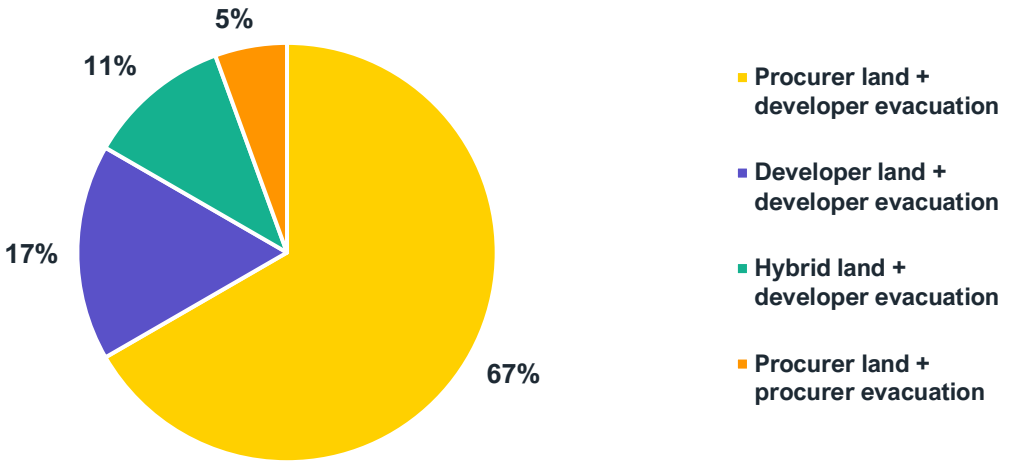
[3] Awarded capacity is a little lower than the total auctioned capacity in all the auctions. For example, the total auctioned capacity for 2-hour, 2-cycle auctions is 7,250MW, and the awarded capacity is 6,890MW. Figure 2 represents auctioned capacity.

above, three are viable (around 67% of the capacity covered) and one is risky, limited to the 15-year tenure procurement.

- Across both configurations, procurement size emerges as a key determinant of tariff viability. Tenders below 500MW show a significantly higher share of viable outcomes than those at or above 500MW. This indicates that smaller tenders tend to result in more disciplined, benchmark-aligned tariffs. In contrast, larger tenders discover more aggressive tariffs driven by expectations of scale-driven pricing advantages and lower supply chain costs at higher volumes.
- Tariff reduction accelerated sharply in the second half of 2025. In the first half of the year, tenders were largely awarded in the range of INR2.1–2.8 lakh/MW/month (USD2,234–2,979/MW/month), with averages aligned to benchmark levels. In contrast, second half procurements cleared at lower tariffs in the range of INR1.5–1.9 lakh/MW/month (USD1,596–2,021/MW/month). The sharp decline in tariffs appears disproportionate to the changes in key input costs across the two halves of the year, especially given the reduction in VGF support from INR27 lakh per megawatt-hour (USD28,723/MWh) to INR18 lakh/MWh (USD19,149/MWh), and an increase in battery raw material prices.

In 2025, the most prevalent configuration, accounting for approximately 67% of tenders, involved the procurer providing land at nominal cost while the developer bears full power evacuation responsibilities (Figure 3).

Figure 3: Standalone BESS tenders classification by configuration in 2025



Source: JMK Research

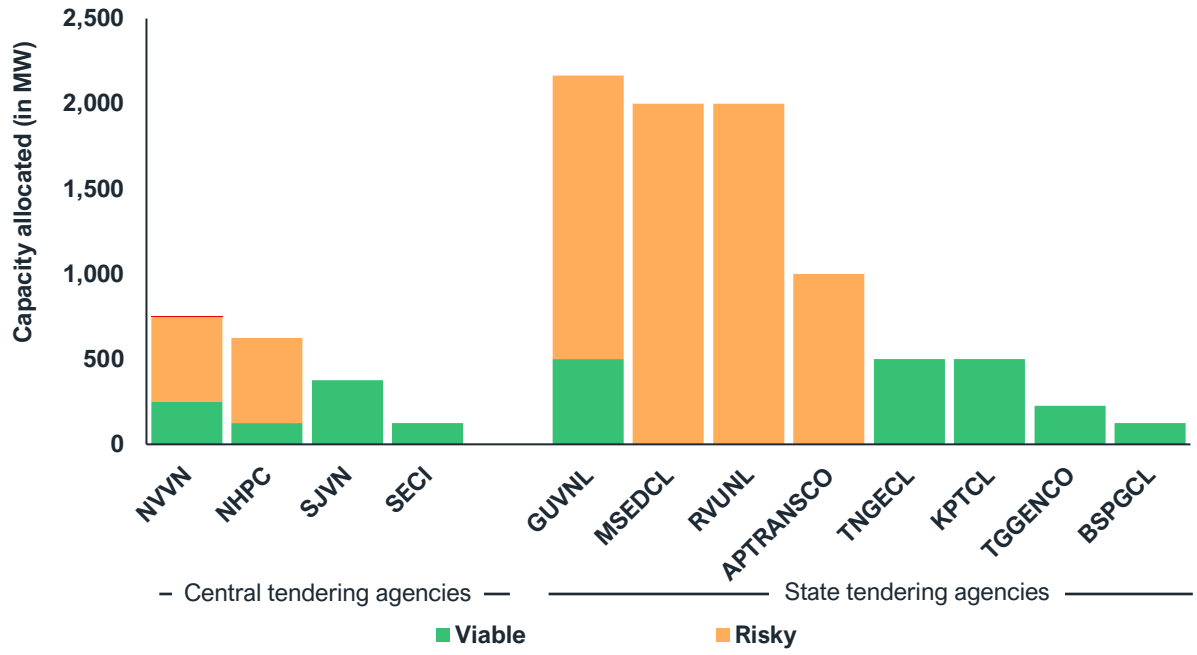
***Note:** 'Hybrid Land' = procurer provides land at actual charges if available, otherwise developer arranges own*

Apart from the tenders included in the benchmark analysis, there were three other ESS tenders following distinct commercial structures and were, therefore, not directly comparable. Their tariff

feasibility is determined based on broad market analysis and JMK Research's stakeholder consultations.

- NTPC Vidyut Vyapar Nigam Ltd's (NVVN) 250MW pan-India tender is a 4-hour, 1-cycle configuration, with developer-led charging. The lowest tariff discovered was INR6.64/kWh, which is largely feasible.
- Maharashtra State Electricity Distribution Co. Ltd's (MSEDCL) 2,000MW is a unique tender having 1-cycle per day format in a 2-hour configuration. The lowest tariff discovered, of INR1.66 lakh/MW/month (USD1,767/MW/month), sits marginally below the viability benchmark, classifying the tender as risky but with limited downside.
- SJVN's 375MW Uttar Pradesh tender is a 4-hour, 1-cycle configuration with a longer 20-year contract tenor. The lowest tariff discovered was INR3.59 lakh/MW/month (USD3823/MW/month), which supports viable project economics.

Figure 4: Capacity allocated by tendering agency and viability classification



Source: Tendering authorities, JMK Research

State agencies allocated the largest share of capacity, led by Gujarat Urja Vikas Nigam (GUVNL) with 2,165MW, MSEDCL with 2,000MW, and Rajasthan Urja Vikas Nigam (RVUNL) with 2,000MW. Together these three agencies account for 6,165MW, or nearly 59% of the total ~10.4GW allocated capacity across the dataset (Figure 4).

- RVUNL and MSEDCL, two of the three largest awarding agencies stand out for the absence of any benchmark-consistent outcomes. None of RVUNL's 2,000MW allocated capacity falls in the viable category.

- Central agencies show stronger alignment with benchmark tariffs. About 46.7% (875MW) of capacity allocated by central agencies falls in the viable category, compared with 21.7% (1,850MW) for state agencies.

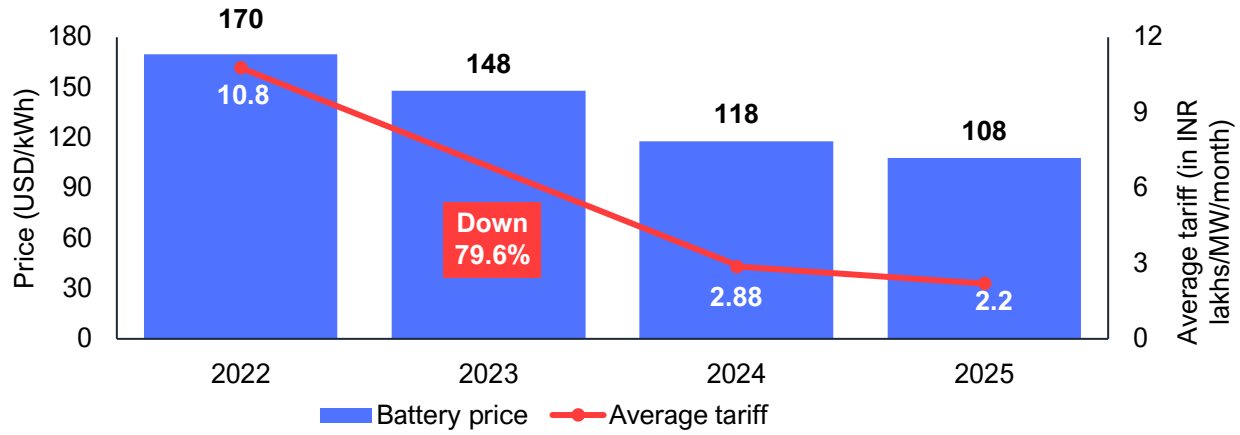
Execution risk evaluation

This section evaluates the key factors influencing the execution of allocated BESS capacity, focusing on battery cost trends, developer capabilities, and financing conditions. Given the aggressive tariff levels observed in recent auctions, these factors play a crucial role in determining the extent to which allocated capacity translates into timely project commissioning.

Battery price risk

Battery remains the most critical cost component in BESS projects, accounting for approximately 60% of total project capex.[4] Accordingly, developers have continued to anchor bidding strategies to aggressive expectations of declining battery costs. Between 2022 and 2025, tariff reduction far exceeded battery cost reductions. Average standalone BESS tariffs declined by 79.6% during this period, whereas battery pack prices fell by 36.5%[5,6] (Figure 5).

Figure 5: Lithium-ion battery pack prices vs average tariffs discovered (2022–2025)



Source: Bloomberg NEF, JMK Research

Note: Prices shown are a global volume-weighted average across lithium-ion (Li-ion) chemistries and all end-use applications; prices for stationary storage battery packs are typically lower than this average; there is no representative auction to derive an average tariff in 2023.

India's reliance on imported cells, particularly from China, makes BESS projects vulnerable to global supply chain disruptions. Recent developments in the mineral markets suggests that the trend of

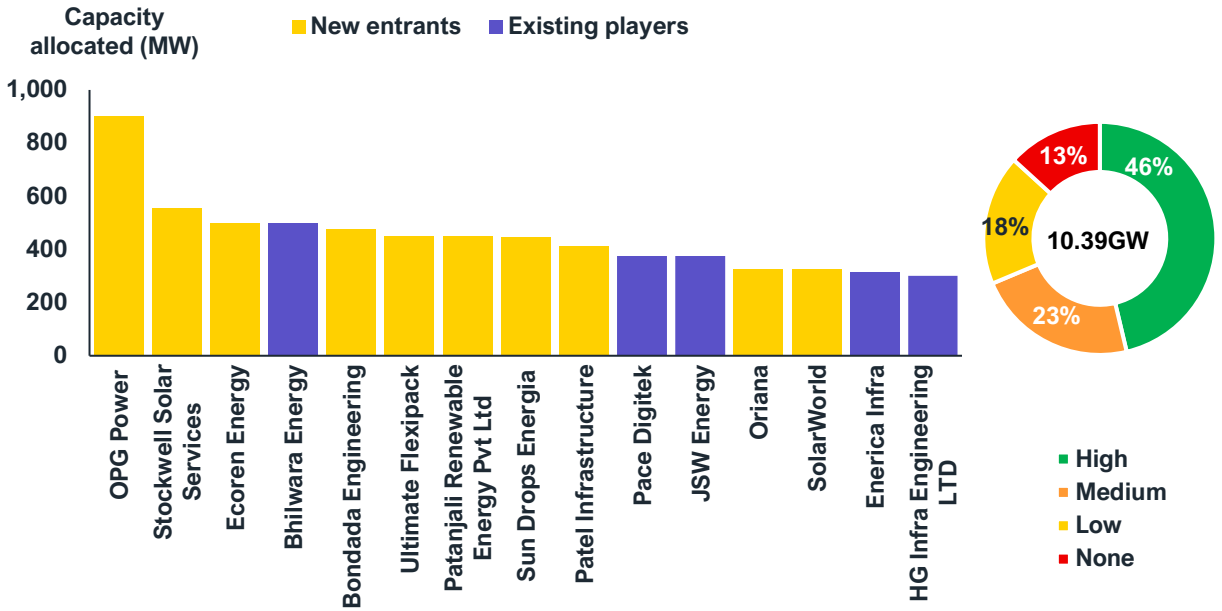
[4] Ember. How cheap is battery storage? December 2025
[5] Economic Times. Battery energy storage cost falls to Rs 2.1/unit from Rs 10.18 in 2022-23: Power Min. March 2026
[6] BloombergNEF. Lithium-Ion Battery Pack Prices Fall to $108 Per Kilowatt-Hour, Despite Rising Metal Prices. December 2025

steady decline in battery prices might face potential pressure. Prices for lithium carbonate, a key input material in lithium iron phosphate (LFP) cell manufacturing, in China started an upward climb in mid-2025 after months of stability, almost doubling by December 2025.[7] At the same time, policy changes such as the phased reduction of China's battery export rebates from 9% to 6% starting April 2026, with full removal by 2027[8], are expected to increase the resultant battery prices in Indian markets, indicating emerging project execution risks.

Execution readiness of allocated developers

Given the nascent nature of the Indian BESS market and associated integration of novel and technologically complex subsystems, developer capability is one of the prime determinants for a project's execution. However, only 4,810MW, representing 46.3% of the total 10,390MW allocated capacity, was awarded to developers considered to have high standalone BESS execution readiness (Figure 6). This assessment was based on prior experience in energy storage project execution, existing capabilities in manufacturing batteries and associated BESS equipment, or an established presence in the independent power producer (IPP) or engineering, procurement and construction (EPC) segments.

Figure 6: Execution readiness assessment of top 15 developers awarded in 2025 BESS auctions



Source: Tendering authorities, JMK Research

[7] Benchmark Mineral Intelligence. Why are lithium prices in China soaring this week? March 2026
[8] Shanghai Metals Market. Overview of the new tax rebates for battery exports from China, effective from 1 April 2026. March 2026

The remainder of the auctioned capacity (around 53.7%) was allocated to entities with minimal to no prior experience in BESS deployment. Awardees also include firms primarily engaged in unrelated industries such as food processing, mining and packaging. Of the top 15 awardees in the standalone BESS space, 10 were new entrants, underlining an elevated execution risk for standalone BESS tenders allocated in 2025.

Long-term financing challenges for BESS projects

Following the execution of the battery energy storage purchase agreement (BESPA), developers are generally required to achieve financial closure within six to 12 months, with nine months being the most common deadline. During this time, lenders perform independent viability assessments before committing capital towards the project. Additionally, industry consultation revealed that financial institutions (FIs) expect an internal rate of return (IRRs) in the range of 15–20% for BESS projects, given the high input cost variability risks and lack of historical precedence for judging the segment. Hence, it becomes imperative for the projects to demonstrate that contracted revenues can support debt servicing while meeting expected return thresholds.

The aggressive tariff discovery observed in recent storage auctions is also beginning to raise questions regarding the financial viability of such projects. Industry participants note that margins in some recent awards may fall into the single-digit range, thereby leaving minimal room for developers to absorb cost overruns or delays. FIs also account for technical credibility of the battery-supplier, with more favourable debt terms extended to developers sourcing from tier-1 suppliers. Additionally, they typically apply more conservative assumptions on capital costs, system performance, and long-term revenue than those used by developers during aggressive bidding.

Based on JMK Research stakeholder consultations, several awardees across recent standalone storage auctions have encountered challenges in structuring viable financing arrangements. In some cases, this has led to more conservative financing structures requiring higher equity investments, stringent sensitivity analysis and enhanced due diligence before capital is committed.

Impact on sectoral development

The uncertainty around battery prices, execution capability of allocated developers and financing constraints is expected to translate into broader sectoral impacts. These risks may lead to implementation delays, degradation in asset quality, and ultimately result in broader renewable energy integration challenges.

Implementation delays

BESS projects in India have historically experienced commissioning delays ranging from six to 18 months, primarily due to prolonged bidding timelines and the technological complexities associated with execution. While the bidding framework is now largely being streamlined and the

implementation ecosystem is maturing (factors that should improve timelines going forward), the emerging execution risks highlighted in the preceding section suggest that delays may persist in the near term or even intensify.

Any further slippages are likely to stem from challenges across the entire project value chain, including financial closure, procurement, construction, and final commissioning. Overall, cumulative delays are expected to remain in the range of nine to 18 months.

Asset quality degradation

According to industry stakeholders, the pressure to meet contractual obligations and adhere to stipulated delivery timelines may lead to compromises in asset quality, particularly in projects allocated at tariffs significantly below benchmark levels. Such compromises could manifest in the use of lower-cost components and greater reliance on tier-2 suppliers, potentially affecting the quality of project engineering, testing, and system integration. This risk is amplified by the inherently multi-component nature of BESS, where system performance is contingent on the integration of multiple subsystems rather than battery quality alone.

These challenges not only result in sub-standard systems but also elevate safety risks associated with lithium-ion infrastructure. Failure events such as thermal runaway can trigger self-sustaining fires, gas release, and re-ignition risks, particularly under India's operating conditions characterised by high temperatures. Consequently, asset quality risks can lead to skewed cost structures, where developers prioritise batteries and power conversion system (PCS) while underinvesting in thermal systems, energy management system (EMS), and EPC quality. Ensuring long-term operational reliability therefore requires maintaining high standards across all system components rather than optimising selectively for cost.

Renewable energy integration bottlenecks

India's power sector is nearing a critical inflection point, where the pace of further sustainable renewable capacity additions will increasingly depend on the availability and robustness of supporting energy storage infrastructure. In 2025, for instance, India added 38GW of solar capacity and yet had to curtail approximately 2.3 terawatt-hour (TWh) of solar generation between May and December.[9]

Meanwhile, India's installed BESS capacity remains around 1.8 gigawatt-hour (GWh) (as of March 2026, with most of it having come online in the last six months of financial year [FY] 2026), even as other major renewable energy markets are rapidly scaling up storage deployment. The US

[9] Ember. India lost 2.3 TWh of solar generation due to grid security concerns, largely concentrated in the second half of 2025. February 2026

commissioned around 50GWh of BESS capacity in 2025, while China added nearly 65GWh in December 2025 alone.[10]

If not addressed in a timely manner, execution risks and implementation delays in BESS deployment could constrain the effective, large-scale integration of renewables into India's energy mix, thereby impacting the country's broader target of achieving 500GW of renewable capacity by 2030.

Future outlook

India's 2025 standalone energy storage market has reached an inflection point. With over 92GWh of BESS in the pipeline, the next few years will be pivotal in shaping the trajectory of the country's energy storage sector.

Timeline pressures and capacity retendering

As the projects allocated in calendar year 2025 move towards financial closure in 2026, developers are likely to seek timeline extensions to realign with market realities and supply chain disruptions. In some cases, where such extensions are not granted or not feasible, projects may undergo changes in ownership structure. This could lead to stranded capacity and subsequent retendering or cancellations.

This will gradually influence how tariff outcomes are assessed in the future, with the regulators placing greater emphasis on considerations around market alignment and execution feasibility alongside price discovery.

Evolution of bidding framework

Recent auction outcomes are likely to prompt adjustments in procurement design. These include:

- **Introduction of floor tariffs**: Future tenders may incorporate cost-reflective and market-aligned tariff floor levels which enables the discovered tariffs to remain within executable range. These floor levels could be anchored in normative cost and return assumptions, similar to those applied in general tariff frameworks.
- **Stricter eligibility criteria**: Future tenders will likely introduce stricter technical criteria mandating prior BESS project execution experience, along with more stringent earnest money deposit (EMD) and performance bank guarantee (PBG) requirements and demonstrated technical and financial strength.
- **Revisiting the auction bidding process**: Using the lowest bids as discovered from reverse auctions has disconnected allocated tariffs from underlying cost realities. This mirrors the experience of the wind sector after 2017, when aggressive tariff discovery resulted in only 41%

[10] Benchmark Mineral Intelligence. China BESS installations in December surpass US 2025 total. January 2026

of the Solar Energy Corporation of India Limited (SECI)-awarded projects (FY2018–2021) being commissioned.[11] The government subsequently intervened by temporarily replacing e-reverse auctions with closed bidding for wind under a composite tariff framework. A similar temporary intervention in standalone storage may be required to align tariffs with execution realities.

- **Standardised bidding timelines and limiting corrigenda**: Frequent last-minute changes to the core operational parameters of the project leave developers with insufficient time to reassess costs and technical requirements, leading to mispricing and aggressive bidding. This was observed in MSEDCL's 2,000MW/4,000MWh tender, where subsequent corrigenda revised key parameters like tenure and required cycles per day very close to the final bidding dates.
- **Diversifying battery chemistry beyond Li-ion:** Overwhelming reliance on lithium-ion technology has exposed the Indian energy storage sector to global supply chain shocks. Going ahead, tendering agencies are likely to equally focus on alternative battery technologies having longer lifespans, higher salvage value, and lower exposure to supply-chain risks, such as with vanadium redox flow (VRF), sodium-ion and solid-state batteries etc. NTPC Renewable Energy Limited's (NTPC REL) recent vanadium redox flow 16.7MW/100MWh tender at Khavda, Gujarat, marks a positive step in this direction.

Standardised payment security mechanism framework for standalone BESS

Unlike the solar and wind segments, payment security mechanisms (PSMs) for standalone energy storage lack a standardised, sector-specific framework. Instruments such as payment security funds (PSF), letters of credit (LC), and statutory provisions like late payment surcharges (LPS) are being applied across tenders, but their structure and coverage vary significantly across procurers, making a fragmented framework insufficient to address ESS-specific risks.

As allocated projects advance toward commissioning, this gap is becoming increasingly evident. Moreover, with future ESS projects development likely to be more state-driven, where off taker profiles and payment risks introduce greater uncertainty, the need for a centralised framework becomes more critical. Industry stakeholders expect central regulators to formulate and introduce an ESS-specific payment security framework in the near future.

Strengthening domestic manufacturing and supply chains

Aggressive bidding and execution delays in BESS projects have clearly highlighted the need for self-sufficiency and reducing heavy import reliance. It is likely to further motivate the central government's push for a strong BESS domestic manufacturing ecosystem. Following provisions are set to take centre stage as India balances project development targets with manufacturing localisation ambitions.

[11] CRISIL Ratings. Wind energy sector set to surge 4-5x on policy tailwinds. March 2023

- **Approved list of battery manufacturers (ALBM):** Like it did for solar photovoltaic (PV) modules, the ALBM will result in quality standardization, as well as generate a significant domestic demand for locally manufactured battery cells. ALBM is likely to be seamlessly integrated with VGF-based tenders to initiate its wide-scale acceptance.
- **Battery cell manufacturing:** Domestic cell manufacturing in India remains at a nascent stage. Against a 50GWh target under a production-linked Incentive (PLI), only 1.4GWh capacity is operational so far, with domestic demand still being largely met through imports. In contrast, more than 10 non-PLI manufacturers have announced around 178GWh of capacity.[12] However, a large share of this remains at the announcement stage, with limited visibility on near-term commissioning. Non-PLI players are expected to drive future scaling up, while import dependence is likely to persist in the short term.
- **National Critical Mineral Mission (NCMM):** This has transitioned from policy to active implementation, with 59 critical mineral blocks auctioned since April 2024.[13] The mission will require sustained efforts to deepen this momentum through global partnerships, domestic exploration, and recycling initiatives to secure lithium, cobalt, and nickel, effectively reducing price volatility and ensuring long-term cost stability.

Conclusion

India's battery energy storage ambitions are entering a decisive phase, where on-ground execution will ultimately determine the scale and pace of deployment. Although the near-term challenges highlighted in the execution risk chapter may lead to some project cancellations or delays, the eventual growth of ESS is inevitable. This momentum is already visible, with the majority of the approximately 1.8GWh of grid scale BESS capacity installed as of March 2026 having come online in the last six months of FY2026. In parallel, the aggressive bidding observed in 2025 is expected to gradually normalise as market participants recalibrate keeping in mind execution realities.

In the near- to medium-term, supply chains are expected to remain largely dependent on China. However, a gradual but clear diversification of sourcing is likely to emerge, with domestic manufacturing assuming a more prominent role as local capabilities strengthen and the market matures. This transition will occur alongside India's efforts to develop partnerships with alternative supplier countries for critical minerals, while battery technologies evolve toward chemistries with lower exposure to import-related risks.

Going ahead, the BESS technology landscape will be a diversified mix of storage technologies including Li-ion, flow batteries, sodium-ion etc. Their co-existence will be driven by different use cases, capacities, and tender designs, each offering distinct advantages in terms of duration, safety,

[12] Press Information Bureau. PLI-ACC SCHEME. February 2026
[13] Ministry of Mines. National Critical Mineral Mission (NCMM). January 2026

lifecycle, and cost structures. Recent utility-scale tenders, specifically for the vanadium flow technology, such as the one issued by NTPC Limited, validate this emerging trend.

Growth at the utility scale will also serve as a key catalyst for storage capacity expansion in the commercial and industrial (C&I) segment, as demand for clean and firm power continues to increase, to support corporate decarbonisation goals. These large-scale deployments and their operational performance will address the primary entry barriers in the C&I segment by validating ESS business models, mitigating technology risks, and progressively reducing costs through economies of scale. At the same time, state-level policies mandating storage integration, as seen in Maharashtra and Rajasthan, are likely to expand C&I BESS demand.

Ultimately, while the road ahead may be arduous, this phase is a necessary transition. India's ability to successfully address the emerging challenges in the ESS sector will hinge on coordinated action and a comprehensive long-term strategy that balances the interests of key stakeholders, including central and state governments, regulators, tendering agencies, developers, and manufacturers. This collective approach will not only shape the growth trajectory of the BESS market but also define its role as a foundational pillar of India's clean energy transition.

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