Merchant Tail Risk and Debt Sizing for India RE Hybrids and Storage in 2026

By Sudarshan Karweer · 28 August 2026 · growthifye.com

A 2026 practitioner guide to sizing debt for Indian renewable, hybrid and storage projects with merchant exposure and tighter lender tests.

India's utility-scale renewable market in 2026 is being financed on a more selective basis than many sponsors expected. The headline story is still capacity growth across solar, wind, hybrid, firm and dispatchable renewable energy, and battery energy storage systems. But at the debt desk, the real debate has shifted from generic bankability to a narrower question: how should lenders size debt when part of the project's revenue depends on merchant prices, short-tenor offtake, peak-price capture, ancillary markets or a residual tail after the contracted period?

This is especially relevant for projects that sit between traditional categories. A plain vanilla 25-year central-agency solar PPA is one thing. A 300 MW solar-wind hybrid with a 100 MWh battery, a 12-year state utility contract, a merchant tail, and some curtailment risk is another. The same applies to C&I portfolios built around open access, group captive structures, and partial merchant optimisation. In 2026, these structures are financeable, but only if sponsors understand how lenders convert revenue uncertainty into leverage, pricing, reserve requirements and covenants.

For Indian developers, lenders, utilities and large C&I buyers, this is now the practical frontier of project debt strategy.

Why merchant tail risk matters more in 2026

Several market conditions have made merchant-tail analysis central to credit underwriting this year.

- Tariffs on many competitively bid renewable projects remain tight, often in the range of roughly Rs 2.40-3.20/kWh for solar or hybrid structures depending on tender design, location, and firmness requirements.
- FDRE, RTC and hybrid tenders increasingly require shaped delivery rather than simple energy volume, which introduces penalties, battery augmentation assumptions and profile risk.
- State discom payment behaviour is still uneven. Even where counterparty risk is acceptable, lenders may not want to assume a long residual value from a weak offtaker after the initial contracted tenor.
- Standalone BESS and solar-plus-storage projects are beginning to monetise more than one revenue line, including capacity-style payments, energy arbitrage, peak support and grid services, but most lenders still haircut non-contracted revenues heavily.
- Curtailment, transmission availability and evacuation congestion remain relevant in states with high renewable penetration.

The result is simple: lenders are no longer satisfied with "there will be a merchant upside later." In most cases, they want to know exactly how much debt can be serviced if post-contract revenues come in lower than the sponsor's base case.

Where merchant exposure shows up in Indian RE structures

Merchant risk is not limited to fully uncontracted projects. It appears in multiple ways across today's financing pipeline.

- Projects with 10-15 year PPAs but 20-22 year loan-life assumptions or extended useful life assumptions
- Hybrid and FDRE assets where a portion of revenue depends on performance incentives or variable settlement mechanisms
- C&I open access portfolios with staggered customer contracts, renewals and replacement risk
- Solar-plus-storage projects where the battery's economic value partly depends on time-of-day spreads
- Standalone BESS bids where fixed availability revenue is complemented by variable dispatch income
- Wind repowering or life-extension cases where refinancing depends on residual generation and market prices after the current supply arrangement

For lenders such as IREDA, PFC, REC, infrastructure NBFCs, select banks and private credit participants, the issue is not whether merchant revenue exists. The issue is how much of it should count for debt sizing.

How lenders are sizing debt against merchant and residual value risk

In 2026, debt sizing for renewable and storage projects in India generally starts with contracted cash flow and then layers progressively more conservative treatment for uncertain revenue.

A typical underwriting framework now includes the following screens.

- Minimum DSCR based on contracted revenues only, often the primary debt-sizing case
- Secondary DSCR including a haircut to merchant or residual revenues
- PLF, CUF and degradation sensitivities, especially where solar-wind complementarity is central to the business case
- Curtailment and grid unavailability assumptions by state, substation and ISTS/intrastate configuration
- Counterparty payment delay assumptions and working-capital stress
- Battery augmentation, round-trip efficiency and replacement reserve assumptions for storage-backed projects
- Refinanceability tests near the end of PPA tenor or before major equipment replacement cycles

For plain contracted utility-scale renewable projects, lenders may still underwrite to minimum annual DSCR thresholds around 1.20x-1.25x and average DSCR around 1.30x-1.35x, depending on counterparty, construction risk and sponsor quality. For projects with material merchant tail exposure, lenders may either reduce base leverage or insist that the entire scheduled amortisation be supported by contracted cash flow only.

That distinction matters. If a sponsor expects 75-78% leverage based on blended contracted and merchant revenues, a lender may instead offer 65-72% based only on the contracted period. The gap then has to be addressed through equity, subordinated capital, back-ended structuring, sponsor support, or a redesign of the offtake arrangement.

For example, consider a hybrid project with a first-year base revenue assumption of Rs 3.80-4.60/kWh blended across fixed offtake and merchant optimisation, but only Rs 3.00-3.30/kWh is clearly contracted. A lender may haircut the variable portion by 30-60%, or ignore it entirely for initial debt sizing. The same pattern is visible in C&I portfolios, where replacement tariffs and customer churn risk are being stress-tested harder than in 2024-25.

The key variables that change leverage

There is no single merchant-risk formula. In practice, five variables do most of the work in changing debt capacity.

1) Contract tenor versus loan tenor

If the offtake agreement runs 12 years and the loan is expected to amortise over 16-18 years, the uncovered period becomes the main credit question. Lenders usually respond in one of three ways.

- Match amortisation largely to contracted tenor
- Allow a shorter merchant tail with heavy revenue haircut
- Build a balloon or mini-perm style structure with refinance expectations

The first option is safest but lowers leverage. The third can preserve leverage, but only for stronger sponsors with credible refinancing pathways.

2) Revenue shape, not just average tariff

A project with the same annual tariff but better evening delivery, seasonal fit or peak coincidence may support better debt metrics than one with flat but poorly timed generation. This is why hybrid and storage cases require hourly or sub-hourly modelling, not just annual CUF assumptions.

For BESS-backed structures, lenders are focusing on:

- Guaranteed availability windows

n- Dispatch obligations and penalties

- Charging energy source and cost
- Degradation path over 8-12 years
- Augmentation capex timing
- Round-trip efficiency under actual operating conditions

This is where [Lender-grade financial modelling](/coreservices/greenfinancing/lendergradefinancialmodelling) becomes decisive. A monthly model is often insufficient for projects with time-of-day settlement logic.

3) Counterparty and payment behaviour

A Rs 4.20/kWh tariff from a weaker payer may support less leverage than a Rs 3.40/kWh tariff from a stronger central intermediary, once collection lag and reserve requirements are included. In India, practical debt sizing still reflects receivable days, LC enforceability, and real payment track record, not just nominal tariff.

4) State policy and open-access stability

For C&I portfolios, debt providers are scrutinising cross-subsidy surcharge, additional surcharge, banking rules, scheduling restrictions and group-captive compliance much more carefully. Projects in states with recurring regulatory volatility may face lower leverage, shorter door-to-door debt tenors or larger DSRA requirements even if customer credit quality is strong.

5) Equipment and performance risk

For hybrids and storage, technology choices now flow directly into financing terms. Module degradation, inverter replacement cycles, wind turbine availability guarantees, battery cell chemistry, thermal management and augmentation strategy all affect residual value assumptions. In 2026, lenders are generally unwilling to grant aggressive tail value to batteries without a clear augmentation and warranty framework.

Practical structuring options to improve bankability

If a project carries merchant or residual exposure, sponsors still have several levers to improve debt outcomes.

Strengthen the offtake stack

The cleanest solution is to replace uncertain tail exposure with contracted cash flow.

- Extend offtake tenor where possible
- Add floor-price features in merchant-linked arrangements
- Use portfolio-level customer diversification in C&I deals
- Split revenue between fixed capacity-style and variable energy components
- Prioritise counterparties with stronger payment discipline over headline tariff alone

For many developers, a slightly lower tariff with better contract durability will increase leverage more than a theoretically higher but uncertain merchant case.

Rework amortisation

Instead of forcing long-tenor debt onto a short-tenor revenue contract, sponsors can front-load amortisation during the firm PPA period. This may reduce equity IRR pressure later and improve refinance options. Cash sweep mechanisms can also help, particularly where generation outperformance is likely in early years.

Ring-fence reserves intelligently

Where lenders are nervous about merchant periods, reserve design can bridge the gap.

- DSRA of 3-6 months, depending on counterparty and volatility
- Major maintenance and inverter replacement reserves
- Battery augmentation reserve for storage assets
- Receivables buffer for delayed utility payments

Well-designed reserves do not eliminate risk, but they can convert a marginal credit into a bankable one.

Use blended capital carefully

For first-of-kind or partially contracted assets, [Blended & concessional finance](/coreservices/greenfinancing/blendedandconcessionalfinance) can sometimes improve viability, especially where climate outcomes, storage integration, grid support or industrial decarbonisation objectives are clear. The point is not to subsidise a weak project indefinitely. The point is to de-risk an asset class long enough for commercial lenders to participate with confidence.

Build stronger lender materials from day one

Projects with merchant exposure need tighter underwriting packs than plain vanilla projects. That means:

- Hourly generation and dispatch analysis
- Revenue waterfall clarity by contracted and non-contracted streams
- State-specific regulatory risk mapping
- Sensitivity cases for tariff compression and lower utilisation
- Warranty-backed augmentation assumptions for storage
- Clear downside and break-even analysis

This is where [Green financing frameworks](/coreservices/greenfinancing/greenfinancingframeworks) and robust technical-financial integration help sponsors speak the language lenders now expect.

What lenders will challenge in diligence

Sponsors should expect focused diligence on the following points before sanction or disbursement.

- Whether contracted revenues alone cover debt service in downside scenarios
- Whether merchant assumptions rely on unrealistic peak spreads or utilisation rates
- Whether battery augmentation capex is understated or pushed too far into the future
- Whether CUF complementarities between wind and solar are based on representative long-term data
- Whether open-access savings are durable after charges, losses and curtailment
- Whether tail-period tariffs assumed in the model are above likely market-clearing prices
- Whether refinancing assumptions depend on future leverage that a new lender may not accept

In several 2026 processes, sponsors are finding that lenders will still approve the deal, but at lower leverage, with tighter cash sweep triggers, or with restricted dividend distribution until performance is proven.

What this means for developers, C&I buyers and policymakers

For developers, the message is that merchant exposure is not unfinanceable, but it must be explicitly structured and priced. Optimism cannot substitute for credit discipline. Stronger offtake design, realistic tail assumptions and detailed operating models are now central to achieving competitive debt terms.

For C&I buyers, there is an opportunity here. Long-term, well-structured offtake can materially lower the project's cost of capital, which can support better delivered tariffs over time. Buyers that offer volume visibility, predictable payment behaviour and sensible contractual flexibility become more valuable financing counterparts.

For lenders, the next wave of renewable credit growth will come from better differentiation rather than blanket caution. Projects with storage, shaped delivery and partial merchant elements should not be treated like plain solar assets, but neither should they be rejected using outdated templates.

For policymakers and utilities, consistency matters. Stable open-access rules, predictable banking treatment, enforceable payment security and workable ancillary-service frameworks can do more to unlock private debt than headline announcements alone.

India's renewable market is evolving beyond simple kWh sale contracts. As hybrid, FDRE, RTC and storage structures expand, the winners in project finance will be those who can translate technical flexibility into lender-acceptable cash flow certainty.

That is the real debt challenge of 2026: not whether a project has upside, but whether enough of that upside can be converted into underwritable revenue.

If you are structuring a hybrid, storage, RTC or C&I renewable transaction and need a lender-ready view on leverage, risk allocation and financing options, contact Growthifye's advisory desk. We help sponsors and offtakers shape bankable capital structures, diligence materials and debt strategy for financial close.

Explore Growthifye's related capabilities

This analysis connects directly to our advisory practice: [Green financing frameworks](/coreservices/greenfinancing/greenfinancingframeworks) · [Sustainability-linked

loans](/coreservices/greenfinancing/sustainabilitylinkedloans) · [Blended & concessional finance](/coreservices/greenfinancing/blendedandconcessionalfinance) · [Impact quantification & MRV](/coreservices/greenfinancing/impactquantificationandmrv).

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