India Data Centre Energy Risk Register 2026: Shape, Basis, Curtailment and BESS

By Sudarshan Karweer · 09 September 2026 · growthifye.com

A practitioner guide to India data centre energy risk allocation in 2026 across OA, RTC, BESS, curtailment, basis and EMS design.

India's data centre market in 2026 is scaling into a power-procurement problem as much as a real-estate and digital-infrastructure story. Hyperscale campuses and colocation operators are adding IT load faster than state utilities can guarantee low-cost, interruption-free supply at all hours. As a result, the winning energy strategy is no longer defined by a single solar or wind PPA, or by a headline renewable percentage. It is defined by how well the operator identifies, allocates, prices and monitors energy risk across the full stack: utility supply, open access renewable procurement, scheduling, deviations, curtailment, backup systems, battery dispatch and internal load flexibility.

This article lays out a practical energy risk register for Indian data centres in 2026. The focus is different from a generic 24/7 clean energy procurement discussion. Instead of asking only how to buy renewable power, the better question is: which risks will affect uptime, landed cost, claims integrity, financing and operating margin, and how should those risks be allocated among the utility, generator, trader, battery operator and data centre off-taker?

For operators planning 10 MW to 150 MW campuses in markets such as Maharashtra, Tamil Nadu, Telangana, Karnataka, Uttar Pradesh and Gujarat, this risk-led approach is now essential.

Why a risk-register approach matters in 2026

In 2026, the cost stack for Indian data centre power is affected by several moving variables at once:

- Utility HT/EHT tariffs often range from about Rs 6.5/kWh to above Rs 9.5/kWh depending on state, demand category, voltage level, time-of-day structure and electricity duty.
- Open access renewable supply can still clear well below utility tariffs on an energy-only basis, but landed delivered cost after wheeling, banking where available, cross-subsidy surcharge, additional surcharge and losses may land anywhere from roughly Rs 4.5/kWh to Rs 7.5/kWh depending on state and structure.
- Hybrid RTC contracts that bundle wind, solar and balancing often price above plain vanilla solar because someone has to absorb shape risk, imbalance costs and firming capacity costs.
- BESS capex has improved, but four-hour systems deployed for outage bridging and limited arbitrage still need careful dispatch logic to justify returns.
- Grid outages, transmission constraints and curtailment remain location-specific and can materially affect achieved uptime and diesel runtime.

A risk register converts these variables into bankable decisions. It helps answer questions lenders and investment committees now ask early:

- What proportion of the load is price-fixed, indexed or floating?
- Who bears renewable intermittency and under-generation risk?
- What happens if open access permissions are delayed?

- How much of the outage risk is absorbed by dual-source utility design versus on-site BESS versus diesel gensets?
- How are curtailment, force majeure and change-in-law settled in cash terms?
- What data and EMS architecture is needed to verify performance each 15-minute block and increasingly each hour?

The seven energy risks that matter most for data centres

A usable energy risk register for a data centre should not contain fifty theoretical items. In practice, seven risk classes drive most of the commercial and operational outcomes.

1. Shape risk

Data centre demand is comparatively flat versus many industrial loads, but it is not perfectly flat. Campus buildout occurs in phases, cooling load changes by season, and AI-oriented racks can sharply alter load density. Renewable generation profiles are inherently shaped by weather and time of day.

If a 50 MW data centre signs a 70 MWp solar-heavy portfolio expecting low-cost daytime supply, the evening and night residual will still need utility power, market purchases, storage dispatch or contracted firming. The mismatch between generation shape and demand shape is shape risk.

In 2026, the cost of shape risk is often underestimated during bid comparison. A solar PPA at Rs 2.8 to Rs 3.4/kWh may appear attractive, but if the same off-taker must buy 35% to 45% of energy during non-solar blocks at Rs 7 to Rs 10/kWh equivalent, the blended delivered economics may disappoint. Wind-solar hybrids and RTC structures reduce this exposure, but they do not eliminate it. Someone still pays for residual mismatch.

Mitigation measures include:

- Start with hourly and 15-minute load modelling, not annual energy targets alone.
- Phase procurement to match campus ramp-up rather than over-contracting from day one.
- Use storage primarily for reliability and peak block shaping, not as a blanket solution for all renewable variability.
- Build contractual generation-shape guarantees carefully, with realistic seasonal bands.

This is where Growthifye's [24/7 clean power contracting](/coreservices/datacentersenergymanagement/247cleanpowercontracting) and Energy management systems capabilities become valuable: the commercial contract and the operating data layer must be designed together.

2. Basis risk

Basis risk arises when the price or availability of power at the generation injection point differs from the economics at the data centre drawal point. In Indian open access structures, basis risk can come from transmission loss assumptions, congestion, changing wheeling charges, banking constraints, balancing-market exposure and state-specific regulatory treatment.

For example, a generator in one state may quote an apparently low tariff into an ISTS-linked route, but the off-taker's actual drawal economics can change if scheduling losses are revised, waivers phase down, or congestion limits usable delivery during high-value blocks. Likewise, state open access consumers can face revised surcharges or changed treatment of standby and banking.

For lenders, basis risk matters because debt sizing based on a simple ex-bus tariff may overstate DSCR resilience. For off-takers, it matters because the delivered cost delta versus utility supply may narrow materially over the PPA term.

Best practice in 2026 is to model at least three basis scenarios:

- Base regulatory case
- Adverse charges-and-losses case
- Restricted-delivery or congestion case

Any procurement memo that presents only generator-bus pricing is incomplete.

Curtailment and outage risk need separate treatment

One of the most common mistakes in data centre energy planning is to combine renewable curtailment risk with grid outage risk as if they are the same problem. They are not.

Renewable curtailment means contracted renewable generation is available in principle but cannot be evacuated, scheduled or delivered due to grid constraints, backing down instructions or network conditions. Grid outage risk refers to interruption at the data centre supply point itself. A site can suffer no distribution-level outage yet still lose renewable delivery and fall back on utility or market power. Conversely, the site can face a local outage even while the contracted renewable plant is generating normally.

For a data centre, these risks have different consequences:

- Curtailment primarily affects energy cost, renewable share and balancing procurement.
- Grid outage primarily affects uptime, transfer logic, UPS loading, BESS autonomy and diesel runtime.

Commercially, the contract should specify curtailment categories:

- Grid curtailment at generator/interconnection side
- Economic backing down or dispatch instructions
- Local site import restrictions
- Force majeure-linked curtailment

The settlement mechanism should also be explicit. Is the remedy deemed generation, liquidated damages, replacement power support, or simply relief from obligation? In 2026, many off-takers are accepting weak curtailment language because they are focused on headline tariffs. That is a mistake for mission-critical loads.

On the site side, outage risk still requires a conventional reliability hierarchy:

- Dual utility incomers where available
- Independent upstream paths and transformer redundancy
- UPS and static transfer coordination
- On-site BESS for no-break bridging and controlled ride-through
- Diesel gensets for extended outages

A four-hour BESS is not an economical replacement for long-duration diesel backup in most Indian data centres today. But a properly integrated BESS can reduce genset starts, improve transfer performance, support black-building restart sequences and lower the energy penalty from micro-outages and poor power quality.

BESS risk is not just capex risk

Battery discussions in data centres are still too often reduced to one question: what is the project cost per MWh? In reality, BESS risk in 2026 has five distinct layers.

Performance risk

Will the battery deliver the warranted usable energy, response time and cycle capability under the actual thermal and dispatch conditions of the site? A 10 MW/40 MWh system used mostly for rare reliability events behaves very differently from one cycled daily for peak shaving and renewable shaping.

Control risk

Poor EMS logic can destroy battery value. If the battery discharges during moderate tariff windows but is unavailable during a true outage or evening scarcity event, the operator loses both resilience and economics. Dispatch hierarchy must be pre-defined.

Augmentation risk

Over a 10- to 15-year horizon, usable capacity degrades. Buyers need a clear augmentation philosophy, including trigger thresholds, who pays, and how replacement modules interact with existing PCS and EMS architecture.

Safety and insurability risk

Insurers now look closely at cell chemistry, enclosure separation, fire suppression, thermal monitoring, emergency response procedures and OEM warranty strength. These factors affect both premium and lender comfort.

Revenue-stacking risk

Many financial models assume too many use-cases at once: outage support, demand optimisation, ToD arbitrage, renewable smoothing and grid services. In practice, mission-critical reliability constraints limit the freedom to monetise all those applications simultaneously.

The right answer for data centres is usually not maximum cycling. It is priority-based dispatch with a reliability reserve floor. Growthifye's [On-site generation & BESS](/coreservices/datacentersenergymanagement/onsitegenerationandbess) work typically needs to be tied to site-specific load criticality, not generic battery payback templates.

Contract design: who should hold which risk?

There is no perfect one-size-fits-all structure, but some allocation principles are emerging in Indian data centre deals.

The generator or seller should usually hold:

- Plant availability risk within defined norms
- Forecasting and scheduling obligations where contracted
- Interconnection-side operational compliance
- Technology performance within warranty limits

The off-taker should usually hold:

- Site load variability risk beyond committed bands
- Internal distribution and facility-side operating constraints

- Dispatch priorities related to business continuity

Shared or specifically negotiated risks include:

- Curtailment beyond seller control
- Change in law affecting open access charges or viability
- Replacement power pricing during under-delivery events
- Deviation charges where both schedule quality and load swings contribute

For RTC and firmed products, the key issue is whether the seller is truly taking shape and balancing risk, or merely passing it through under a packaged label. Operators should insist on answers to a few practical questions:

- Is the supply obligation defined by annual energy, monthly energy, block-wise availability or a contracted schedule?
- What under-supply threshold triggers compensation?
- Is replacement power physically arranged or only financially settled?
- Are market purchases capped, passed through or embedded in tariff?
- How are force majeure and transmission constraints carved out?

Without these clauses, a so-called firm power contract may still leave the data centre carrying most of the economic variability.

The role of EMS and operational governance

A modern data centre energy strategy can fail even with good contracts if the metering, controls and governance are weak. By 2026, the minimum serious architecture should include:

- Revenue-grade metering across utility incomers, OA drawal, DGs, UPS, major cooling systems and battery nodes
- 15-minute and hourly visibility for scheduling, settlement and performance review
- Curtailment and outage event tagging with root-cause classification
- Battery state-of-charge controls linked to outage probability and tariff windows
- Cooling and non-IT load optimisation linked to tariff and reliability conditions

For example, a campus with 1.45 PUE and partial thermal flexibility may be able to pre-cool selectively in lower-cost blocks, preserve battery reserve for critical events and avoid avoidable evening imports at high marginal cost. That is not only an efficiency measure; it is risk management.

This is where [Load & reliability engineering](/coreservices/datacentersenergymanagement/loadandreliabilityengineering) and Energy management systems intersect. The operator needs a single operating philosophy spanning procurement, controls, resilience and reporting. Siloed teams create blind spots: procurement optimises tariff, facilities optimises uptime, and finance discovers months later that delivered cost and risk are out of tolerance.

A practical 2026 checklist for boards, lenders and operators

Before financial close or major contract signature, decision-makers should test the following:

- Has the site load been modelled at 15-minute granularity for current and ramp-up phases?

- Is there a delivered-cost model including all OA charges, losses, backup energy and balancing assumptions?
- Have utility, OA and behind-the-meter options been compared on a like-for-like uptime basis?
- Does the contract define curtailment, under-supply and replacement-power responsibilities precisely?
- Is BESS sized for a specific reliability function, rather than generic storage enthusiasm?
- Are EMS controls specified early enough to support contractual KPIs and event analytics?
- Has lender downside analysis tested regulatory change, congestion and lower-than-expected renewable delivery?
- Is there a governance cadence for monthly risk review after commissioning?

For many Indian data centres, the best answer in 2026 will be a layered portfolio rather than a single-source solution: strong utility backbone, selective open access renewable procurement, limited but high-value on-site BESS, tight EMS control, and contracts that recognise the true cost of firmness and flexibility.

The key takeaway is simple. Data centre energy procurement is now a risk-allocation exercise before it is a tariff exercise. Operators that quantify shape, basis, curtailment, outage and battery-dispatch risk upfront will make better decisions on PPA structure, grid design, capex allocation and lender engagement.

If your team is evaluating a new campus, utility-plus-OA portfolio, or BESS-backed reliability design, contact Growthifye’s advisory desk for a practical review of your energy risk register, contract structure and operating model.

Explore Growthifye's related capabilities

This analysis connects directly to our advisory practice: [Load & reliability engineering](/coreservices/datacentersenergymanagement/loadandreliabilityengineering) · [24/7 clean power contracting](/coreservices/datacentersenergymanagement/247cleanpowercontracting) · [Grid connectivity & redundancy](/coreservices/datacentersenergymanagement/gridconnectivityandredundancy) · [On-site generation & BESS](/coreservices/datacentersenergymanagement/onsitegenerationandbess).

ABOUT THE AUTHOR

Sudarshan Karweer — Chief Executive Officer, Growthifye

Over 23 years in management consulting — concept to scale — building and scaling new-age digital and energy businesses. An EY alumnus, Sudarshan leads Growthifye's renewable energy & storage advisory, EPC, transmission engineering and green-financing practices for developers, utilities and C&I consumers across India.
Contact: info@growthifye.com · +91 84510 99371 · growthifye.com