



# The Age of Exponential Energy

When Tariffs, Timelines, and Technology Collide

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# The Contract That Couldn't Keep Up

## The Problem

In the time it took to approve a single tariff, the cost of battery storage fell by **40 per cent**. India's energy transition isn't failing—it's accelerating.

## The Reality

Yet our regulatory architecture is still designed for a slower age. The Central Electricity Regulatory Commission's (CERC) 2025 decision to refuse tariff adoption for JSW's 500 MW / 1,000 MWh battery storage project has become emblematic of a deeper structural problem.

## The Challenge

The ruling was not a rejection of technology—it was a rejection of time lag. When technology costs fall exponentially, even a two-year administrative delay can distort market economics.

The once-rational tariff becomes obsolete before the ink on the Power Purchase Agreement (PPA) dries. India's energy revolution is running at tech speed, but its contracts are still operating at bureaucratic speed.

# Flashpoint 1 – JSW BESS: When Time Kills Value

## The Award

In 2022, JSW Renew Energy Five won SECI's first large-scale battery energy storage (BESS) tender.

## The Collapse

By the time tariff adoption reached CERC in 2024, global lithium-ion prices had plunged from about **USD 300 / kWh to USD 150 / kWh**.

## The Decision

CERC's 2025 order (Petition No. 138/AT/2024) refused to adopt the tariff, holding that the delay in signing Battery Energy Storage Purchase Agreements (BESPA/BESSA) had rendered the bid economically outdated.

APTEL later upheld the decision, noting that approving the old tariff would effectively overcharge consumers. This case signalled a regulatory awakening: **the cost of waiting can be as damaging as the cost of error**.

Parameter	Details
Project Description	500 MW / 1,000 MWh BESS tendered by SECI; awarded to JSW Renew Energy Five Ltd.
What Went Wrong	Delay in signing BESPA/BESSA; BESS costs fell $\approx$ 40 %; tariff misaligned with 2025 market.
Regulatory Decision	CERC Order 138/AT/2024: Refused tariff adoption under Section 63 due to market misalignment.
Commissioning	Not commissioned; capacity to be re-tendered / renegotiated.
Current Status (2025 Q4)	APTEL upheld CERC; JSW exploring new bids.
Key Learnings	Static PPAs cannot track tech cost curves; need for dynamic or indexed tariffs.

# Flashpoint 2 – KERC 50 MW Solar: When Delay Becomes Liability

A developer in Karnataka sought a 180-day extension for a 50 MW solar project delayed by land and transmission issues. By the time the plant was ready, a new tariff period had begun with lower rates.

KERC refused the extension, applying the revised tariff of **₹ 2.85 / kWh** instead of the earlier, higher one. The Appellate Tribunal upheld this stance, reaffirming that tariffs belong to time windows, not projects.

This ruling reinforced the discipline of execution velocity. In a falling-cost environment, **time is not neutral—it's expensive.**

Parameter	Details
Project Description	50 MW solar PV plant under state PPA (Karnataka).
What Went Wrong	180-day delay; developer sought to retain old tariff.
Regulatory Decision	KERC (2024): Denied extension; lower tariff applied. APTEL (2025): Upheld decision.
Commissioning	Yes – under reduced tariff.
Current Status	Operating; returns reduced $\approx$ 10–12 %.
Key Learnings	Delay erodes bankability; strict timelines safeguard consumers; need clear delay clauses.

# Flashpoint 3 – CESC Hybrid: When Compliance Outpaces Intention

## The Tender

In 2024, CESC Ltd floated a 300 MW wind-solar hybrid tender. The process, though competitive, deviated from MNRE's standard bidding guidelines and was filed late for approval.

## The Rejection

CERC rejected tariff adoption, citing procedural non-compliance and delay in deviation approval.

## The Outcome

The tender, meant to promote hybrid flexibility, collapsed under administrative rigidity.

Parameter	Details
Project Description	300 MW wind-solar hybrid procurement by CESC (Kolkata).
What Went Wrong	Guideline deviations unapproved; delay in filing for tariff adoption.
Regulatory Decision	CERC (2024): Rejected petition for non-compliance with Section 63.
Commissioning	No – likely to be re-tendered.
Current Status	Awaiting revised bid under updated MNRE hybrid framework.
Key Learnings	Process discipline is critical; regulatory timeliness equals market confidence.

# The Pattern Beneath the Problems

All three flashpoints expose a systemic tension between exponential technology and linear regulation.

Factor	Policy Cadence	Technology Cadence
Battery Costs	Revised every 2–3 years	Fall 15–20 % annually
PPA Timelines	18–24 months	Plants deployable in 6 months
Market Signals	Annual tenders	Real-time price variation

The energy sector has entered the **Exponential Zone**: every delay destroys data relevance. The result is predictable—developers face uncertainty, regulators face litigation, and consumers pay for outdated prices.

## From Contract 2.0 to Market 3.0

India's power market is still anchored in Contract 2.0 thinking—fixed-price PPAs designed for a static world.

The coming decade demands **Market 3.0**—adaptive, digital, and algorithmic.

Regulation must evolve from approval to automation—with digital audits, API-based data feeds, and time-stamped cost indices ensuring tariffs stay relevant to market reality.

Model	Defining Feature	Future Enabler
Fixed PPA	Locked price for 20–25 years	High exposure to tech cost decline
Indexed PPA	Linked to commodity / tech index	Reduces stranded cost
Smart Contract	Blockchain-based real-time dispatch	Automates tariff alignment
Flexibility Market	Pay-for-capacity and response	Integrates BESS & DSM services

# Firstgreen's Perspective: Building Adaptive Energy Markets

## Our View

At Firstgreen Consulting, we see these flashpoints not as failures but as early-warning indicators of an outdated contracting paradigm. Our consulting experience across solar, hybrid, and storage projects shows that tariff obsolescence is now one of the biggest hidden risks in project bankability.

## Our Advocacy

To bridge this, Firstgreen advocates:

- Dynamic tariff mechanisms indexed to technology cost curves.
- Regulatory sandboxes under CERC/SERCs for pilot blockchain-based PPAs.
- Shorter bid-to-commissioning cycles ( $\leq 9$  months).
- Market-linked flexibility payments for BESS and hybrid assets.

## Our Vision

India can lead the world by building the first adaptive contracting framework for renewables—one that reflects real-time economics rather than static assumptions.

## The Future Is Not Linear

The story of JSW BESS, KERC's solar ruling, and CESC's hybrid rejection all converge on one truth:

**The future of energy will not wait for paperwork.**

As costs fall and technologies converge, the winners will be those who move at the speed of electrons, not files. India's clean-energy market must evolve from contract compliance to market intelligence—from **Contract 2.0 to Market 3.0**.