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EDITORIAL ANALYSIS

Two Markets, One Cost Curve: How EV and Grid Storage Can Cut Cell Costs

DOWN TO EARTH

7 July 2026 · ECONOMY · GS3

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Down to Earth 7 July 2026 GS3

Source: ujiyari.com — researched, fact-checked & UPSC-mapped

INTERVIEW ANGLE

"India''s battery-cell PLI has commissioned barely 3 per cent of its target and its budget was cut. Can combining EV demand with grid-storage demand do what subsidies could not, structurally push down lithium cell costs?"

Source: Original editorial ↗ Down to Earth

THE LIFT LINE

> *"A subsidy buys a discount once. A cost curve, driven by scale, keeps giving. India has two battery markets, electric vehicles and grid storage, and treating them as one could bend the price of the cell in a way no incentive can."*

Global battery prices are falling fast, and the reason is not generosity but **scale**. Every doubling of cumulative production cuts costs by roughly a fifth. India, however, has bet on **incentive-led capacity** through its **Advanced Chemistry Cell (ACC) PLI**, which has commissioned barely **3 per cent of its target** and just had its budget cut. This editorial argues that combining **electric-vehicle demand with battery-energy-storage-system (BESS) demand** onto **one shared cost curve** is the structural way to cut lithium cell costs.

WHY THIS EDITORIAL MATTERS FOR YOUR EXAM

GS Paper 3: Infrastructure, energy; conservation and environmental impact; indigenisation (https://ujiyari.com/vocab/indigenisation/) of technology; the economics of the energy transition. It links to India"s climate commitments, critical-mineral security and manufacturing policy.

This theme lets you connect the learning-curve economics of batteries, India"s PLI performance, grid-storage targets and mineral security into one analytical answer, ideal for GS3 economy and energy questions.

BACKGROUND AND CONTEXT

The **lithium-ion cell** is the shared heart of both electric mobility and grid storage. Its cost has fallen dramatically:

- **2024:** pack prices fell 20 per cent to about **115 dollars per kWh**, the biggest annual drop since 2017.
- **2025:** a further 8 per cent to a record **108 dollars per kWh**; **stationary storage became the cheapest segment at about 70 dollars per kWh**, down 45 per cent in a year.

This follows a **learning curve (experience curve)**: cost falls by roughly **19 to 20 per cent for every doubling of cumulative production**, much like solar. The lesson is that **volume, not subsidy, is the durable cost lever**.

India"s manufacturing bet is the **Advanced Chemistry Cell (ACC) PLI**, a **Rs 18,100 crore** scheme targeting **50 GWh** of domestic cell capacity, run by the Ministry of Heavy Industries.

THE CORE ARGUMENT / ISSUE

The central claim is that **demand aggregation across EVs and grid storage** can bend the cell cost curve structurally, whereas India"s incentive-led capacity push is faltering.

The Incentive Route Is Under-Delivering

INDICATOR	STATUS
ACC PLI outlay	Rs 18,100 crore, target 50 GWh
Commissioned by Oct 2025 (IEEFA)	About 2.8 per cent (1.4 GWh), one firm
FY27 budget allocation	Cut 44.5 per cent to Rs 86 crore
Cell import dependence	Over 90 per cent, mostly from China

Per **IEEFA (Institute for Energy Economics and Financial Analysis)**, only about **2.8 per cent (1.4 GWh)** of the 50 GWh target was commissioned by October 2025, entirely by **Ola Electric**, and the **FY27 budget cut the annual allocation 44.5 per cent**. The design rewarded proposed capacity over operational manufacturing experience.

The Demand-Aggregation Alternative

India needs about **236 GWh of battery storage by 2031-32** (Central Electricity Authority, National Electricity Plan), supported by a **Viability Gap Funding (https://ujiyari.com/terms/viability-gap-funding/) scheme for BESS** whose supported capacity has been raised from 4,000 MWh toward 13,200 MWh within a Rs 3,760 crore VGF envelope. Simultaneously, **EV penetration is about 8 per cent** of vehicle sales, backed by the **PM E-DRIVE scheme (Rs 10,900 crore)**.

Crucially, **EVs and grid storage increasingly use the same LFP (Lithium Iron Phosphate) chemistry**. Pooling their demand onto one cell line reaches each **production doubling faster**, cutting costs along the learning curve, rather than depending on **fragile, budget-dependent one-off discounts**.

The Honest Counter

India still imports over 90 per cent of its cells, mostly from China, and demand aggregation cannot by itself create manufacturing capacity. Grid-storage demand depends on tenders and viability-gap support that are themselves uncertain. Aggregation is a powerful lever, but not a substitute for capacity and minerals.

HOW TO THINK ABOUT THIS (ANALYTICAL FRAME)

> *A subsidy lowers price once and disappears with the budget. A learning curve lowers price permanently, but only if volume keeps doubling. Ask whether a policy adds durable demand to the cell line or merely a temporary discount. Splitting EVs and grid storage into separate markets slows each toward its next doubling; merging them speeds both. The cheapest cell is not bought, it is manufactured at scale, and scale is a demand decision as much as a supply one.*

THE DIAGRAM IN WORDS

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Lithium cell = shared heart of EVs and grid storage -> cost falls ~19-20% per doubling of cumulative volume (learning curve) -> 2025 pack price record low 108 dollars/kWh, stationary storage cheapest at ~70 dollars/kWh -> lesson: scale, not subsidy, is the durable lever -> India bet on ACC PLI (Rs 18,100 crore, 50 GWh) -> but only ~2.8% (1.4 GWh) commissioned by Oct 2025 (IEEFA), FY27 allocation cut 44.5% -> India needs ~236 GWh storage by 2031-32 (CEA) + EV share ~8% -> EVs and BESS share LFP chemistry -> pool demand onto one cost curve = faster doublings = structurally cheaper cells -> caveat: over 90% cells imported from China -> fix: joint EV-BESS procurement + fix PLI design + scale VGF/storage + secure minerals (Reasi, NCMM)
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WAY FORWARD

1. **Aggregate demand deliberately.** Coordinate EV and grid-storage procurement around common LFP cells so pooled volume drives the learning curve, not two separate small markets.
2. **Fix the PLI design.** Reward operational, commissioned manufacturing and experienced makers over paper capacity, and re-tender lapsed quotas transparently.
3. **Scale the storage pipeline.** Expand the VGF for BESS and firm up the 236 GWh storage trajectory (https://ujiyari.com/vocab/trajectory/) so grid demand reliably feeds the cost curve.
4. **Secure the minerals.** Advance the Reasi (J&K) lithium resource to a bankable stage and use the National Critical Minerals (https://ujiyari.com/terms/critical-minerals/) Mission to reduce cell-import dependence.

PYQ LINKAGE AND PRACTICE

- **UPSC GS3 (2023):** "Explain the concept of a circular economy (https://ujiyari.com/terms/circular-economy/) and how it would be beneficial." (battery recycling and cost)
- **UPSC GS3 (2022):** "Describe the benefits of deriving electric energy from sunlight in contrast to conventional energy generation." (learning-curve parallel with solar)
- **UPSC GS3 (2020):** Questions on energy storage and India"s renewable-energy targets.

Practice Mains question (250 words, 15 marks): "India"s battery-cell strategy has leaned on incentive-led capacity that is under-delivering. Examine how aggregating electric-vehicle and battery-storage demand onto a shared learning curve could structurally lower lithium cell costs, and what enabling steps this requires."

Sources: Down To Earth (https://www.downtoearth.org.in), Ministry of Heavy Industries (https://heavyindustries.gov.in), Central Electricity Authority (https://cea.nic.in)

KEY ARGUMENTS AT A GLANCE

Because lithium-ion cell costs fall along a learning curve of roughly 19 to 20 per cent per doubling of cumulative volume, combining electric-vehicle demand with battery-energy-storage-system demand onto a single shared cost curve, increasingly on common LFP chemistry, can structurally lower cell prices, unlike India''s incentive-led ACC PLI, which has commissioned barely 3 per cent of its target and seen its FY27 allocation cut.

✓ SUPPORTING

- Global lithium-ion battery pack prices fell to a record 108 dollars per kWh in 2025, and stationary storage became the cheapest segment at about 70 dollars per kWh, showing grid storage can independently drive the cost curve down.
- India''s Advanced Chemistry Cell PLI, an 18,100 crore rupee scheme targeting 50 GWh, had only about 2.8 per cent (1.4 GWh) commissioned by October 2025 per IEEFA, and its annual allocation was cut 44.5 per cent in the FY27 budget.
- EVs and grid storage increasingly share LFP cells, so pooling their demand reaches each production doubling faster and cuts costs structurally, rather than through fragile, budget-dependent one-off discounts.

⚠ COUNTER

Sceptics note that India still imports over 90 per cent of its cells, mostly from China, that demand aggregation cannot substitute for domestic manufacturing capacity, and that grid-storage demand depends on tenders and viability-gap support that are themselves uncertain.

→ WAY FORWARD

Aggregate EV and BESS demand through joint procurement and standard LFP cells, fix the PLI design to reward operational manufacturing, scale the VGF for BESS and the storage pipeline, and secure critical minerals through the Reasi find and the National Critical Minerals Mission.

MAINS ANSWER FRAMEWORK

QUESTION

"India''s battery-cell strategy relies too heavily on incentive-led capacity and too little on demand aggregation." Examine how combining EV and battery-storage demand could structurally lower lithium cell costs. (250 words)

INTRODUCTION

The cost of an electric vehicle and the cost of grid storage both hinge on one component, the lithium-ion cell. Battery costs fall predictably with scale, so how India builds demand matters as much as how it subsidises supply.

Combining two markets onto one cost curve could do what incentives alone have not.

BODY

Lithium-ion battery pack prices fell to a record 108 dollars per kWh in 2025, down 93 per cent in real terms since 2010, and stationary storage became the cheapest segment at about 70 dollars per kWh. This follows a learning curve of roughly 19 to 20 per cent cost decline per doubling of cumulative production.

The policy implication is that scale, not one-off subsidy, is the durable lever. India''s Advanced Chemistry Cell PLI, an 18,100 crore rupee scheme targeting 50 GWh, illustrates the weakness of the incentive-led route: per IEEFA, only about 2.8 per cent, or 1.4 GWh, was commissioned by October 2025, entirely by one firm, and the FY27 budget cut the annual allocation by 44.5 per cent to 86 crore rupees.

Meanwhile India needs about 236 GWh of battery storage by 2031-32 per the Central Electricity Authority, alongside rising EV demand, now about 8 per cent of vehicle sales. Because both use LFP cells, pooling their demand hits each production doubling faster, structurally lowering costs.

India still imports over 90 per cent of its cells from China, so aggregation must pair with domestic capacity and secure minerals, including the Reasi lithium find.

CONCLUSION

India should stop treating EVs and grid storage as separate battery markets. Aggregating their demand onto one LFP cost curve, while fixing PLI design and securing minerals, offers a structural path to cheaper cells that subsidies alone cannot deliver.

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