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EDITORIAL ANALYSIS

Building Bridges: On India's Solar Surge and the Battery Storage Gap

THE HINDU

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EDITORIAL SUMMARY

The Hindu editorial (May 6, 2026) — *"Building Bridges: On India's Solar Generation and Battery Storage"* — acknowledges India's remarkable renewable energy achievement (150 GW solar, ranked 3rd globally per IRENA 2026) but issues a sharp warning: **the mismatch between solar generation capacity and grid-scale storage is creating a new energy vulnerability**. The piece documents **2.3 TWh of solar energy wasted (curtailed) in 2025** — equivalent to powering millions of homes — because the grid could not absorb peak midday generation. Meanwhile, **evening demand peaks continue to be met by coal and gas plants**, defeating the purpose of expanding solar.

The editorial argues that India's **500 GW non-fossil capacity target by 2030** (currently ~283 GW) requires a parallel, equally ambitious **Battery Energy Storage System (BESS) deployment programme** — and that without it, the renewable targets represent installed capacity on paper rather than reliable, dispatchable clean energy.

KEY ARGUMENTS

The Duck Curve Problem

India's grid exhibits a classic **"duck curve"** phenomenon:

TIME OF DAY	SOLAR GENERATION	GRID DEMAND	RESULT
Morning peak (6–9 AM)	Low (sunrise)	High	Fossil fuel fills gap
Midday (11 AM–3 PM)	Maximum	Moderate	**Over-generation; curtailment**
Evening peak (5–9 PM)	Near zero (sunset)	Maximum	**Fossil fuel essential**
Night	Zero	Moderate	Fossil fuel/hydro required

Without storage, **solar can only displace fossil fuels during midday hours** — it cannot address morning or evening peaks, which are precisely when grid stress is highest.

The Numbers

METRIC	VALUE
Solar energy curtailed (wasted) in 2025	**2.3 TWh**
India's installed solar capacity (March 2026)	**150.26 GW**
India's BESS capacity (deployed)	**~4–5 GWh** — a fraction of what's needed
CEA energy storage target	**60.63 GW total storage by 2030** (41.65 GW BESS + 18.98 GW pumped hydro)
India's NDC non-fossil target	**500 GW by 2030** (at 283 GW, ~57% of way there)
China's BESS deployment (2025)	**>200 GWh** — 40x India's current scale

What Needs to Happen

The editorial recommends:

1. **Mandatory storage requirements** — all new solar/wind tenders above a certain scale must include BESS component
2. **Viability Gap Funding (VGF)** for storage — as was done for solar in its early years
3. **Domestic battery manufacturing** — PLI for Advanced Chemistry Cell (ACC) batteries to reduce import dependence on China for lithium-iron-phosphate (LFP) cells
4. **Pumped hydro acceleration** — India has 96.5 GW of viable pumped hydro storage potential (only 4.7 GW developed); fastest-to-deploy for large scale
5. **Grid modernisation** — smart grid infrastructure for demand-side management

POLICY CONTEXT

POLICY/SCHEME	RELEVANCE
CEA Energy Storage Plan (2024)	60.63 GW total storage by 2030 — 41.65 GW BESS + 18.98 GW pumped hydro
PLI for ACC Batteries	₹18,100 crore; 50 GWh domestic cell manufacturing
PM KUSUM	Solar pumps for agriculture; reduces agricultural load on grid
RDSS (Revamped Distribution Sector Scheme)	Grid modernisation; smart meters
Green Energy Corridors	Transmission infrastructure for renewable integration
OSOWOG	One Sun One World One Grid — cross-border renewable integration

UPSC RELEVANCE

PAPER	ANGLE
GS3 — Energy	Solar energy, grid storage, BESS, pumped hydro, energy transition
GS3 — Environment	NDC targets, renewable integration, carbon emissions
GS3 — Economy	PLI for ACC batteries, energy security, import dependence

Mains Keywords: Battery Energy Storage System (BESS), duck curve, solar curtailment, 500 GW NDC target, pumped hydro storage, PLI ACC batteries, National Battery Storage Mission, Green Energy Corridor, grid modernisation, energy transition India

Prelims Facts Corner

ITEM	FACT
Solar curtailed 2025	**2.3 TWh** wasted in India
India solar installed	**150.26 GW** (March 2026; IRENA 3rd globally)
CEA energy storage target	**60.63 GW by 2030** (41.65 GW BESS + 18.98 GW pumped hydro)
PLI for ACC	₹18,100 crore; **50 GWh** domestic cell manufacturing
India pumped hydro potential	**96.5 GW** viable; only 4.7 GW developed
India NDC non-fossil target	**500 GW by 2030**
China BESS scale	>200 GWh deployed (2025) — ~40x India
Duck curve	Midday solar oversupply + evening fossil-fuel peak demand mismatch

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