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EDITORIAL ANALYSIS

The Grid Is the Bottleneck: On Cheap Power and Stranded Renewables

DOWN TO EARTH

20 June 2026 · ENVIRONMENT · GS3

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Down to Earth 20 June 2026 GS3

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

INTERVIEW ANGLE

"If solar power is now the cheapest electricity ever, why is so much of it sitting idle, and what does that tell us about energy planning?"

Source: Original editorial ↗ Down to Earth

Every fact web-verified against primary sources (https://ujiyari.com/how-we-verify/)

WHY THIS MATTERS NOW

India has built some of the cheapest renewable electricity on the planet, and it is adding solar and wind capacity at a remarkable pace. Yet a paradox (https://ujiyari.com/vocab/paradox/) has emerged: clean power is being stranded. Commissioned projects sit idle because the transmission grid cannot carry their output to where it is needed. The constraint on India's energy transition has shifted from generation to the wires that move it, and that shift demands a new policy focus.

THE CRUX IN 60 WORDS

Solar and wind are now the cheapest power India has ever had, but much of it cannot reach consumers because transmission has not kept pace. Renewable capacity is clustered in a few states, output is variable, and evacuation infrastructure lags. The grid, not generation, is now the binding constraint, and unlocking it requires storage, better conductors, and smarter planning.

THE ISSUE, DECODED

ELEMENT	WHAT IT IS	WHY IT MATTERS
Stranded renewables	Clean power that cannot be evacuated	Wastes cheap capacity and forces coal use
Grid bottleneck	Insufficient transmission to load centres	The new binding constraint on the transition
Variability	Solar and wind output swings sharply	Needs flexible grids and storage
Green Energy Corridors	Transmission scheme for renewables	Partial fix, planning still lags
500 GW by 2030	Non-fossil capacity target	Achievable only if the grid can carry it

THE ANALYSIS: WHEN THE WIRES CANNOT KEEP UP

1. **Generation outpaced transmission.** Tariffs fell and capacity surged, but transmission is slow to build, requiring rights of way, clearances, and long lead times. The result is a structural mismatch.
2. **Geography concentrates the problem.** Renewable resources are richest in states like Rajasthan and Gujarat, while large load centres are elsewhere, so the burden falls on long inter-state transmission corridors.
3. **Variability stresses the grid.** Solar peaks at midday and wind fluctuates, producing sharp swings the grid must absorb. Without storage and flexibility, surplus power is curtailed and wasted.
4. **Stranding has real costs.** Idle projects cannot recover investment, curtailment wastes clean energy, and the country keeps burning coal to fill gaps that stranded renewables could have covered.

DATA AND INSTITUTIONS VAULT

India's goal of 500 GW of non-fossil-fuel electricity capacity by 2030.

Scheme to build transmission infrastructure for evacuating renewable power.

Waiver of inter-state transmission system charges to encourage renewable adoption.

General Network Access regime governing transmission access.

Battery energy storage and pumped-hydro storage to time-shift surplus generation.

THE DEBATE

The argument for building transmission and storage aggressively is that without it, cheap clean power is wasted, coal use persists, and climate targets slip. The grid is the strategic enabler of the entire transition.

The argument against rushing transmission is that building wires ahead of confirmed generation risks stranded grid assets and higher tariffs for consumers if projects do not materialise as planned.

The balanced verdict: the risk of under-building the grid now outweighs the risk of over-building it, given the pace of renewable growth. Coordinated planning that pairs transmission with confirmed generation and storage minimises both dangers.

HOW TO THINK ABOUT THIS (TRANSFERABLE SKILL)

> *In any system, find the binding constraint, the single bottleneck that limits the whole. For India's energy transition, that constraint has moved from generation cost to transmission capacity. Solving the wrong constraint, for instance adding still more cheap generation, yields nothing if the wires cannot carry it. Always ask: what is the limiting factor now, and is policy still fighting yesterday's constraint?*

DIAGRAM-IN-WORDS

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Cheap solar built -> Concentrated in few states -> Grid cannot evacuate -> Curtailment and stranding -> Storage plus conductors plus planning -> Power delivered
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THE WAY FORWARD

1. **Scale up storage**, both battery and pumped-hydro, to time-shift surplus midday solar to evening demand.
2. **Deploy advanced high-capacity conductors** to move more power over existing transmission corridors.
3. **Reform transmission planning** to build capacity in anticipation of renewable growth, not in reaction to it.
4. **Strengthen inter-state corridors** and coordinate generation and transmission timelines.
5. **Modernise grid operations** for flexibility to absorb variable renewable output.

THE TAKEAWAY BOX

Use for the energy transition, climate commitments, and the economics of renewable integration.

"Cheap clean power is only useful if it can be delivered."

500 GW non-fossil target by 2030, Green Energy Corridors, ISTS waiver, General Network Access, battery and pumped-hydro storage.

Balancing the urgency of climate action against the risk of stranded public infrastructure tests prudent (https://ujiyari.com/vocab/prudent/) stewardship of resources.

Connects to past questions on renewable energy and India's climate commitments.

Climate policy, energy security (https://ujiyari.com/terms/energy-security/), infrastructure financing, and the net-zero pathway.

Sources: Down to Earth (https://www.downtoearth.org.in/), PIB (https://pib.gov.in/)

Source: The Grid Is the Bottleneck: On Cheap Power and Stranded Renewables — Ujiyari.com | Free UPSC & State PCS Editorial Analysis

KEY ARGUMENTS AT A GLANCE

Record-cheap renewable generation is being stranded by transmission bottlenecks, making the grid, not generation, the binding constraint on India's clean-energy transition.

✓ SUPPORTING

- Renewable capacity is concentrated in a few resource-rich states while demand lies elsewhere, straining inter-state transmission.
- Variable solar and wind output needs storage and flexible grids that current infrastructure lacks.
- Evacuation delays leave commissioned renewable projects unable to sell their power.

⚠ COUNTER

Building transmission ahead of demand risks stranded grid assets and higher tariffs if generation does not materialise as planned.

→ WAY FORWARD

Invest in battery storage, advanced conductors, and transmission-planning reform to evacuate idle renewable capacity efficiently.

MAINS ANSWER FRAMEWORK

QUESTION

'India''s clean-energy transition is increasingly limited by transmission, not generation. Examine the grid bottleneck and the reforms needed to unlock stranded renewable capacity. (250 words)'

INTRODUCTION

India has achieved some of the cheapest renewable electricity in the world, yet a growing share of that clean power cannot reach consumers. The transition's binding constraint has quietly shifted from how cheaply we can generate to how reliably we can transmit.

BODY

Solar and wind tariffs have fallen to record lows, and capacity is being added rapidly toward the goal of 500 GW of non-fossil capacity by 2030. But generation is concentrated in resource-rich states such as Rajasthan and Gujarat, while load centres lie elsewhere, placing enormous stress on inter-state transmission.

Renewables are also variable: they surge at midday or in high winds and vanish otherwise, so the grid must be flexible enough to absorb sharp swings, which much of it is not. The consequence is stranding. Commissioned projects sit idle because evacuation infrastructure has not kept pace, and curtailment wastes clean power even as the country burns coal. Schemes such as the Green Energy Corridors and the inter-state transmission charge waiver have helped, but planning still lags generation.

The fixes are clear in principle: battery and pumped-hydro storage to time-shift surplus, advanced high-capacity conductors to move more power on existing rights of way, and a transmission-planning process that builds capacity in anticipation of, not in reaction to, renewable growth.

CONCLUSION

Cheap clean power is only useful if it can be delivered. India must treat the grid as the strategic frontier of its energy transition, investing in storage, conductors, and forward-looking planning to stop stranding the very capacity it celebrates.

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