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**DAILY EDITORIAL
ANALYSIS**

TOPIC

***INDIA'S ENERGY TRANSITION: WHY THE
GREEN SHIFT STILL RUNS ON COAL?***

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Context

- The recent escalation of **conflict in West Asia** and the resulting rise in global crude oil and LNG prices have once again highlighted **India's vulnerability to external energy shocks**.
- **Nearly half of India's fossil fuel** imports transit through the **Strait of Hormuz**, including crude oil from Saudi Arabia and LNG imports from Qatar.
 - ♦ **Key Trends in India's Energy Sector**
- Renewable energy accounted for **42.4% of installed power capacity by March 2026**, compared to just **0.72% in 2005**.
- Coal's share in installed capacity declined from **58.7% in 2005 to 42.2% in 2026**.
- Since 2017, renewable energy has contributed the largest share of new capacity additions.
 - ♦ However, installed capacity does not translate into actual electricity generation.
- In April 2026, renewables generated only **15.8%** of electricity. Coal still contributed around **71.8%** of total electricity generation.
 - ♦ It reveals that renewable energy is being added **alongside coal rather than replacing it**.

Why Coal Still Dominates?

- **Baseload Requirement:** Coal provides continuous and reliable electricity needed for industries, railways and urban centres.
- **Intermittency of Renewables:** Solar and wind power depend on weather conditions and time of day.
- **Lack of Storage Infrastructure:** India still lacks adequate battery storage and pumped hydro systems.
- **Grid Limitations:** Existing transmission systems are not fully capable of integrating large-scale renewable power.
- **Slow Retirement of Coal Plants:** Very few old coal plants have been phased out.
 - ♦ As a result, coal acts as the balancing source whenever renewable output declines.

Need for Energy Transition in India

- **Energy Security:** India imports over 85% of its crude oil needs. Dependence on imported fossil fuels exposes the economy to geopolitical disruptions and price volatility.
- **Climate Commitments:** Under the **Paris Agreement** and **India's Panchamrit goals** announced at COP26, India has committed to:
 - ♦ Achieving **500 GW non-fossil fuel capacity by 2030**
 - ♦ Reducing emissions intensity
 - ♦ Achieving net-zero emissions by 2070
- **Reducing Inflationary Pressures:** Global spikes in oil and coal prices directly affect electricity tariffs, transport costs, industrial production, and fiscal deficit.
 - ♦ A stronger renewable system can reduce such external shocks.
- **Sustainable Economic Growth:** Clean energy sectors generate employment in solar manufacturing, green hydrogen, battery storage, and EV ecosystem.
- **Environmental Protection:** Coal-based power contributes significantly to air pollution, greenhouse gas emissions, and public health burden.
 - ♦ Thus, energy transition is necessary for sustainable development.

Concerns, Challenges and Issues in India's Energy Transition

- **Capacity vs Generation Gap:** There is a mismatch between renewable installed capacity and actual generation.

- ◆ Large installed capacity figures create an impression of transition, but coal still dominates real electricity supply.
- **Intermittent Nature of Renewables:** Solar and wind power cannot ensure uninterrupted supply without storage systems, flexible grids, and demand management.
- **High Cost of Energy Storage:** Battery storage remains expensive and technologically dependent on imports.
- **Grid Modernisation Challenges:** India's transmission infrastructure requires significant upgrades for renewable integration, cross-state transmission, and smart grid management.
- **Financial Stress in DISCOMs:** State electricity distribution companies suffer from high losses, delayed payments, and weak financial health.
 - ◆ It affects renewable power procurement.
- **Coal Dependency of Key Sectors:** Sectors like steel, cement and heavy industries still rely heavily on coal.
- **Geopolitical Vulnerability:** Even domestic electricity prices remain indirectly linked to global fossil fuel markets because coal determines the marginal cost of power generation.

Related Government Efforts and Initiatives

- **National Solar Mission:** Launched under the National Action Plan on Climate Change (NAPCC), it aims to promote solar energy deployment.
- **PM-KUSUM Scheme:** Promotes solar pumps and decentralised renewable energy in agriculture.
- **Green Energy Corridor Project:** Focuses on strengthening transmission infrastructure for renewable integration.
- **National Green Hydrogen Mission:** Aims to make India a global hub for green hydrogen production.
- **Production Linked Incentive (PLI) Scheme:** Encourages domestic manufacturing of solar modules, and advanced chemistry batteries.
- **International Solar Alliance (ISA):** India-led initiative promoting global solar cooperation.
- **Faster Adoption and Manufacturing of Electric Vehicles (FAME):** Supports electric mobility and reduction in oil dependence.

Way Forward: What More Needs to be Done?

- **Expand Energy Storage Infrastructure:** Large-scale investment is needed in battery storage, pumped hydro storage, and grid-scale backup systems.
- **Modernise the Electricity Grid:** India needs to build smart grids, flexible transmission networks, and real-time power balancing systems.
- **Gradual Coal Transition Strategy:** Instead of abrupt shutdowns, India should retire inefficient plants, improve efficiency of existing plants, and ensure just transition for coal-dependent regions.
- **Strengthen Domestic Manufacturing:** Reducing import dependence in solar modules, lithium batteries, and rare earth materials is essential for energy security.
- **Promote Green Mobility:** Expansion of EV infrastructure and public transport can reduce oil imports.
- **Reform DISCOMs:** Financially stable DISCOMs are critical for scaling renewable procurement.
- **Diversify Energy Sources:** India should expand nuclear energy, bioenergy, offshore wind, and green hydrogen.

Daily Mains Practice Question

[Q] Examine the structural challenges associated with India's energy transition and discuss the measures required to build a reliable and sustainable low-carbon energy system.

Source: TH

