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EDITORIAL ANALYSIS

Net-Zero by 2070 and Viksit Bharat by 2047 — Can India Achieve Both Without Compromise?

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GS3



The Hindu

MAINS RELEVANCE:

GS Paper 3



INTERVIEW ANGLE

"India has committed to net-zero emissions by 2070 while also targeting developed-nation status by 2047 (Viksit Bharat). Are these two goals compatible, and what structural reforms are needed to pursue both simultaneously?"

WHY IN NEWS

NITI Aayog released its report “Scenarios Towards Viksit Bharat and Net Zero” — the first systematic attempt to map the pathways India needs to simultaneously achieve developed-nation status by 2047 and net-zero greenhouse gas emissions by 2070, revealing both the opportunities and the profound tensions between these twin ambitions.

THE DUAL AMBITION AND ITS INTERNAL TENSION

India has committed to two historically unprecedented simultaneous targets: becoming a **developed nation** (Viksit Bharat) by **2047** — the centenary of independence — and achieving **net-zero GHG emissions** by **2070**, India’s Nationally Determined Contribution (NDC) under the Paris Agreement.

The internal tension is real and structural. Development, historically, has meant industrialisation — and industrialisation has meant carbon emissions. The UK industrialised for 150 years on coal before beginning decarbonisation. The US built its \$25 trillion economy on cheap fossil fuels. China is still the world’s largest emitter as it continues its development trajectory. Why should India be different?

The NITI Aayog report represents India’s attempt to answer this question with analysis rather than assertion: that there is a pathway to development and decarbonisation simultaneously, but it requires structural transformation at a scale and speed that India has not achieved in any prior domain.

WHAT VIKSIT BHARAT ACTUALLY REQUIRES

Achieving **developed-nation status by 2047** implies reaching a **per capita income of approximately USD 12,000–15,000** (current developed-nation threshold; adjusting for inflation it may be higher). India's current per capita GDP is approximately **USD 2,500**. This requires **sustained growth of 7–8% annually** for over two decades.

This growth will be driven by:

Manufacturing scale-up: India's manufacturing share of GDP (~15%) must grow to 25%+ — requiring energy-intensive sectors (steel, cement, chemicals, heavy machinery)

Urbanisation: India will add 400 million urban residents by 2047 — each requiring infrastructure (buildings, roads, water systems) that is carbon-intensive to build

Energy access: India's electricity consumption per capita (~1,000 kWh/year) must approach developed-nation levels (~8,000–10,000 kWh/year) to power the productive economy

All three pillars of Viksit Bharat create enormous energy demand — and unless that demand is met by clean sources, it creates carbon lock-in that makes the 2070 net-zero target unachievable.

THE NET-ZERO 2070 PATHWAY

India's net-zero commitment involves:

Renewable energy scale-up: India's 2030 target is **500 GW of non-fossil fuel capacity** (current: ~200 GW). By 2070, essentially the entire power grid must be zero-carbon

Transport electrification: ~200 million ICE (internal combustion engine) vehicles must be replaced or converted to EVs

Hard-to-abate sectors: Steel, cement, chemicals, and aviation cannot electrify easily — requiring green hydrogen, carbon capture, or process innovation

Carbon sequestration: India's forests and agroforestry must be managed to absorb residual emissions

The 2070 timeline gives India **47 more years** — generous compared to developed nations' 2050 targets — but the emission trajectory is not linear. India's emissions are still **rising** as economic activity expands. The critical question is when India's **peak emissions** will occur. Delaying the peak means steeper decarbonisation slopes later.

FINANCING THE TRANSITION — THE MISSING PIECE

The NITI Aayog report identifies **climate finance** as the binding constraint. India's green transition requires:

USD 2.5 trillion in clean energy investments between 2026 and 2050 (approximately)

Current annual climate-related investment: ~USD 40–50 billion — a **20× scale-up required**

The **loss and damage fund** established at COP27 (Sharm el-Sheikh) and operationalised by COP28 (Dubai) provides some multilateral flows, but the scale is far below India’s requirement. The **Green Climate Fund (GCF)** and **Clean Development Mechanism (CDM)** have historically underdelivered on promises to developing nations.

India’s position — articulated consistently at UNFCCC COPs — is that **climate finance is a developed-nation obligation** under the principle of **Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC)**. The developed world, having emitted the majority of historical cumulative emissions, owes the developing world the financial and technology support to grow without repeating their emissions trajectory.

This is morally sound but operationally insufficient unless India simultaneously mobilises domestic capital, creates the right regulatory incentives for private climate investment, and develops the institutional infrastructure to absorb large-scale international climate finance.

WHAT INDIA MUST DO

Accelerate peak emissions: India must aim to peak its absolute GHG emissions by **2035 at the latest** — not just peak emissions intensity. This requires rapid deployment of renewables, energy efficiency standards for industry, and carbon pricing signals.

Price carbon domestically: India has a carbon trading pilot (PAT — Perform, Achieve and Trade — scheme for energy-intensive industries) but lacks a comprehensive carbon price. A properly designed carbon market would internationalise the cost of emissions and create incentives for clean technology adoption.

Green industrialisation: New manufacturing facilities (steel, cement, chemicals) should be built to zero-carbon or near-zero-carbon specifications from the outset — not built dirty and retrofitted later. The cost differential between green and conventional manufacturing is narrowing rapidly; locking in conventional plants creates stranded asset risks.

Just transition mechanisms: Coal mining employs approximately 3 lakh workers directly and supports millions of livelihoods in Jharkhand, Chhattisgarh, and Odisha. The transition away from coal must be accompanied by credible retraining, economic diversification, and social protection — as Germany’s Ruhr Valley transition and Canada’s Alberta transition illustrate.

THE OPPORTUNITY — NOT JUST THE CONSTRAINT

The NITI Aayog report’s crucial insight is that the green transition is not only a constraint on India’s development — it is an **economic opportunity**. India’s renewable energy sector is already one of the world’s most cost-competitive. India can be a **major exporter** of:

Solar modules and components (building on PLI schemes)

Green hydrogen (targeting USD 1/kg production cost)

Electric vehicles and components

Carbon credits under Article 6 of the Paris Agreement

A country that leads the green technology supply chain does not sacrifice development for climate — it builds a development model **on** climate leadership.

The 2070 net-zero target and Viksit Bharat 2047 are achievable together — but only if treated as a design problem requiring deliberate structural transformation, not as separate aspirations hoped to converge on their own.

UPSC RELEVANCE

India's net-zero target year (2070), Viksit Bharat (2047), NITI Aayog report "Scenarios Towards Viksit Bharat and Net Zero", India's NDCs under Paris Agreement, 500 GW non-fossil capacity target by 2030, PAT scheme (Perform Achieve and Trade), CBDR-RC principle, Green Climate Fund (GCF), CDM (Clean Development Mechanism), Loss and Damage Fund (COP27), COP28 (Dubai), India's per capita electricity consumption (~1,000 kWh/year).

India's climate commitments; NDCs and Paris Agreement; energy transition; green hydrogen; renewable energy policy; CBDR-RC; just transition; climate finance; coal dependency; carbon pricing in India.

★ FACTS CORNER — KNOWLEDGEPEDIA

INDIA'S CLIMATE COMMITMENTS (NDCS):

- Net-zero target: **2070** (India's NDC under Paris Agreement)
- Emissions intensity reduction: **45%** by 2030 (vs. 2005 baseline)
- Non-fossil electricity capacity: **500 GW** by 2030
- Current non-fossil capacity: **~200 GW** (solar + wind + hydro + nuclear)
- 50% of electricity from non-fossil sources by 2030

VIKSIT BHARAT 2047:

- Goal: Developed-nation status by India's centenary of independence (**2047**)
- Current per capita GDP: **~USD 2,500**; developed-nation threshold: **~USD 12,000–15,000**
- Required growth: **7–8% annually** for 20+ years

CLIMATE FINANCE GAP:

- India's green transition need: **~USD 2.5 trillion** (2026–2050)
- Current annual climate investment: **~USD 40–50 billion** (needs 20× scale-up)
- Loss and Damage Fund: Established at **COP27** (Sharm el-Sheikh, Egypt, 2022)
- GCF = **Green Climate Fund**; CDM = **Clean Development Mechanism**

KEY PRINCIPLES:

- CBDR-RC** = Common But Differentiated Responsibilities and Respective Capabilities
- Paris Agreement**: Adopted **December 12, 2015** (COP21, Paris); in force **November 4, 2016**
- India joined Paris Agreement: **October 2016**

DOMESTIC CARBON MECHANISM:

- PAT Scheme** (Perform, Achieve and Trade): India's existing carbon trading for energy-intensive industries under National Mission for Enhanced Energy Efficiency (NMEEE)
- Carbon Credit Trading Scheme (CCTS)**: India launched pilot in 2023

OTHER RELEVANT FACTS:

- India's coal employment: **~3 lakh direct workers** (Jharkhand, Chhattisgarh, Odisha)
- Green hydrogen target: **USD 1/kg** production cost (National Green Hydrogen Mission)
- Global warming scenarios: 1.5°C and 2°C pathways (IPCC AR6, 2021-22)
- India's electricity consumption per capita: **~1,000 kWh/year** (developed nations: 8,000–10,000)

Sources: The Hindu, NITI Aayog

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