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Bioenergy and Green Hydrogen Pivot: Shaktikanta Das Signals Energy-Transition Re-Prioritisation

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WHY IN NEWS

At the **CII Annual Business Summit 2026** held in New Delhi on **May 12, 2026**, **Shaktikanta Das**, **Principal Secretary to the Prime Minister** (former **RBI Governor 2018-2024**), flagged **bioenergy and green hydrogen** as the Government's two top energy-transition priorities. The pivot comes against a backdrop of **Strait of Hormuz tensions**, elevated crude (WPI fuel +24.71 per cent YoY for April 2026), and the work of the **5th Informal Empowered Group of Ministers (iEGoM)** on energy supply-chain disruption, chaired by Defence Minister **Rajnath Singh**.

THE PIVOT EXPLAINED

| PILLAR | PROGRAMME | OUTLAY / TARGET |
|-----------------------|--|--|
| Green Hydrogen | National Green Hydrogen Mission (NGHM) | Rs 19,744 crore; 5 MMT/year by 2030 |
| Bioenergy | National Bioenergy Programme (CBG, biomass, biodiesel) | ~Rs 800-1,000 crore/year + SATAT offtake guarantees |
| Cross-cutting | iEGoM Energy Supply Chain | Strategic stockpiles, alternative crude routes, SPR Phase II |

The thesis: with crude exposed to West Asia disruption, India must accelerate **indigenous fuel substitution** – bioenergy for transport and feedstock, green hydrogen for industry.

NATIONAL GREEN HYDROGEN MISSION – ARCHITECTURE

| PARAMETER | VALUE |
|------------------------------------|--|
| Cabinet approval | launched in 2023 (specifically January 4, 2023) |
| Outlay | Rs 19,744 crore (FY 2023-24 to 2029-30) |
| Production target by 2030 | 5 million metric tonnes (MMT) of green hydrogen |
| Renewable capacity addition target | 125 GW |
| Estimated investment | Rs 8 lakh crore |
| Estimated job creation | 6 lakh+ |
| Implementing Ministry | Ministry of New and Renewable Energy (MNRE) |
| Implementing agency for SIGHT | Solar Energy Corporation of India (SECI) |

What Is Green Hydrogen?

| TYPE | PRODUCTION METHOD |
|---------------------------|---|
| Grey hydrogen | Steam Methane Reforming (SMR) of natural gas – the current global default |
| Blue hydrogen | SMR + Carbon Capture, Utilisation and Storage (CCUS) |
| Green hydrogen | Electrolysis of water using renewable electricity – zero direct CO ₂ |
| Turquoise hydrogen | Methane pyrolysis with solid carbon as by-product |

SIGHT – Flagship Sub-Scheme

Strategic Interventions for Green Hydrogen Transition has two components:

- **SIGHT Mode 1:** Incentives for **electrolyser manufacturing** (3,000 MW capacity target by 2026; 8,000 MW by 2030)
- **SIGHT Mode 2:** Incentives for **green hydrogen production** – Rs 50/kg in Year 1, Rs 40 in Year 2, Rs 30 in Year 3

Progress Snapshot (as of 2026)

- Installed green-hydrogen production capacity: **~8,000 tonnes/year**
- Bids awarded for **electrolyser manufacturing**: ~2,000 MW (Reliance, Adani, L&T, Ohmium, BHEL among awardees)

- **Pilot Projects:** Steel (Tata Steel, SAIL); Shipping (Cochin Shipyard); Heavy Mobility (NTPC at Leh); Refining (IOCL Panipat)
- **Green Hydrogen Hubs:** Kandla, Tuticorin, Paradip notified as initial hubs (under MoPSW)

SATAT AND THE NATIONAL BIOENERGY PROGRAMME

SATAT – Sustainable Alternative Towards Affordable Transportation, launched **October 1, 2018** by MoPNG.

SATAT Architecture

- Long-term offtake guarantee (15+ years) from oil-marketing PSUs (IOCL, BPCL, HPCL)
- Per-unit pricing linked to a fixed reference, indexed to CNG retail
- **Letters of Intent (LoIs):** ~5,000+; **CBG plants commissioned by 2026:** 100+
- Target: **5,000 CBG plants** producing **15 MMT/year of CBG**

Feedstocks

- Agricultural residue (paddy straw, sugarcane bagasse, cotton stalk)
- Cattle dung; sewage sludge; press-mud from sugar mills
- Municipal solid waste (organic fraction)

National Bioenergy Programme (MNRE)

- **Phase I (2021-22 to 2025-26):** Rs 858 crore
- Three sub-schemes: **Waste-to-Energy, Biomass Programme (BPDB), Biogas Programme**

Ethanol Blending Programme (EBP) – complementary

- **EBP target:** 20 per cent (E20) by 2025-26
- Achieved blending: ~14-15 per cent through 2025-26
- 2G ethanol plants (e.g., **IOCL Panipat**) use agricultural residue
- The **Pradhan Mantri JI-VAN Yojana (2019)** supports 2G ethanol

BIODIESEL AND SAF

- Biodiesel from **non-edible oilseeds** (jatropha, karanja, mahua, neem)
- **B20 target:** 5 per cent blend by 2030

- **Sustainable Aviation Fuel (SAF):** Indigo, Air India flew limited SAF flights from 2024
- ICAO **CORSIA** offset framework applicable from 2027 (mandatory phase)

THE 5TH IEGOM AND ENERGY CRISIS MANAGEMENT

- **Informal Empowered Group of Ministers (iEGoM)** is convened to handle inter-ministerial coordination on energy supply
- Chaired by Defence Minister **Rajnath Singh**
- Membership: MEA, MoF, MoP&NG, MNRE, MoPSW, Cabinet Secretariat
- **Mandate:** contingency plans for Strait of Hormuz disruption; SPR drawdown protocols; alternative crude sourcing

INDIAN ENERGY MIX – CONTEXT

| SOURCE | APPROX. SHARE OF PRIMARY ENERGY |
|------------------------------|---------------------------------|
| Coal | ~55 per cent |
| Oil (mostly imported) | ~28 per cent |
| Natural Gas | ~6 per cent |
| Renewables + Nuclear + Hydro | ~10-11 per cent |

The Government's pivot is to expand the last category – of which **bioenergy** and **green hydrogen** are the most domestically resilient options.

STRATEGIC IMPLICATIONS

Energy Security

- Bioenergy substitutes imported petroleum and LNG with domestic biomass and waste
- Green hydrogen replaces imported grey hydrogen in refining and fertiliser; long-term replaces coking coal in steel-making
- Both reduce **exposure to Strait of Hormuz** disruption

Climate

- India's NDC commitments: 50 per cent non-fossil capacity by 2030; 45 per cent emission-intensity reduction (vs 2005); net-zero by 2070
- Green hydrogen is the principal route for **hard-to-abate sectors** (steel, fertiliser, refining, shipping)

Industrial Policy

- Electrolyser manufacturing creates a domestic supply chain
- 2G ethanol valorises agri-waste, addressing both paddy-stubble burning and farm income

Fiscal

- Capital subsidies and PLIs are sizeable; fiscal calendar must accommodate them
- Crude-substitution dividends accrue in foreign-exchange savings (every USD 10/bbl cut in import bill = ~USD 13 billion)

UPSC RELEVANCE

GS Paper 3 – Environment, Energy, S&T

- Renewable energy missions; green hydrogen and bioenergy
- Energy security and import substitution
- Climate commitments and NDCs

GS Paper 2 – Policies and Schemes

- Inter-ministerial coordination; iEGoM model
- Centrally Sponsored vs Central Sector schemes

Mains Angles

- 1 Discuss the National Green Hydrogen Mission and the SIGHT scheme. Why is green hydrogen central to India's hard-to-abate decarbonisation?
- 2 Evaluate SATAT and the National Bioenergy Programme as instruments of farmer income, energy security and climate action.
- 3 The Government has flagged bioenergy and green hydrogen as the principal energy-transition priorities. Examine the rationale in light of West Asia geopolitics.

Approved since 2023 (specifically **January 4, 2023**); outlay **Rs 19,744 crore**; target **5 MMT/year by 2030**; 125 GW associated RE capacity.

Strategic Interventions for Green Hydrogen Transition – flagship sub-scheme; two components (electrolyser manufacturing; green hydrogen production).

Sustainable Alternative Towards Affordable Transportation; launched **October 1, 2018** by MoPNG; promotes Compressed Bio-Gas (CBG).

Pradhan Mantri Jaiw Indhan – Vatavaran Anukool Fasal Awashesh Nivaran Yojana (2019); supports 2G ethanol plants from agri-residue.

Target **E20 by 2025-26**; achieved ~14-15 per cent.

Informal Empowered Group of Ministers on energy supply chain; chaired by Defence Minister Rajnath Singh; convened on West Asia disruption.

50 per cent non-fossil installed capacity by 2030; **45 per cent emissions-intensity reduction (vs 2005)**; **net zero by 2070**.

Launched **2010** under JNNSM; target now **280 GW solar by 2030**.

Coal ~55 per cent; oil ~28 per cent; gas ~6 per cent; renewables ~10 per cent of primary energy.

RBI Governor **December 2018-December 2024**; thereafter Principal Secretary to the Prime Minister.

New Delhi, May 12, 2026; key Government-industry interface.

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