

# India's Energy Transition

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## India's Energy Transition: Strategy, Security, and Sustainability

### Context:

As India became the **4th largest economy in 2025** with a GDP of **\$4.3 trillion**, energy security has emerged as a key pillar of its developmental and strategic agenda. In a recent op-ed, the Union Petroleum Minister outlined India's energy transition journey, emphasizing the nation's achievements in **biofuels**, **green hydrogen**, and infrastructure development. This comes at a time when India's energy needs are growing rapidly, and its climate responsibilities are becoming more demanding.

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### India's Energy Security: Why It Is Crucial

- **Rising Energy Demand:** India is projected to contribute **25% of the global energy demand by 2047**, underlining the need for a reliable and clean energy supply.
- **Strategic Independence:** Reducing dependence on volatile international energy markets enhances **sovereignty and national security**.
- **Developmental Imperative:** With a **6.7% growth rate in Q1 2025**, continuous energy supply is essential for supporting infrastructure, industry, and services.
- **Balanced Regional Development:** Energy access through **city gas distribution** and **rural LPG penetration** ensures equitable growth across regions.
- **Global Climate Commitments:** To achieve **net-zero emissions by 2070**, India must diversify its energy mix and invest in sustainable alternatives.

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### India's Multi-Dimensional Energy Strategy

- **Diversification of Energy Sources:** India is expanding energy imports from **new international partners** while promoting **domestic production** to reduce oil dependency.
  - **Exploration Expansion:** Through reforms in **OALP and DSF**, exploration coverage has increased from **8% in 2021 to 16% in 2025**, with a goal of **1 million sq. km by 2030**.
  - **Gas Pricing Reforms:** Natural gas is now priced based on **10% of India's crude basket**, and a **20% premium** is offered for new wells, encouraging private investments.
  - **Infrastructure Expansion:** India has developed **24,000 km of product pipelines** and **96,000 fuel retail outlets**. ONGC and Oil India have added **75 MMtoe** through new oil and gas finds.
  - **Digital Governance:** Over **1 lakh energy assets** have been mapped under **PM Gati Shakti**, leading to **₹169 crore** in cost savings through logistics optimization.
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## Green Energy Push: India's Transition to Clean Fuels

- **Ethanol Blending Milestone:** Ethanol blending rose from **1.5% in 2013 to 19.7% in 2025**, saving **₹1.26 lakh crore** in foreign exchange and generating **₹1.79 lakh crore** in payments to distillers.
  - **Green Hydrogen Progress:** India has tendered **8.62 lakh tonnes** of green hydrogen. IOCL has awarded a **10 KTPA green hydrogen plant at Panipat**, while NRL leads hydrogen deployment in the Northeast.
  - **Compressed Biogas (CBG) Growth:** Under the **SATAT** scheme, over **100 CBG plants** are operational. India aims for **5% CBG blending by 2028**, promoting circular economy and waste reduction.
  - **Gas Pipeline Network:** The national gas grid has expanded to **25,000 km**, with a target of **33,000 km by 2030** to enhance last-mile energy connectivity.
  - **Hybrid Energy Leases:** A **2024 amendment** allows the co-existence of **hydrocarbon and renewable projects** on the same site, accelerating low-carbon transitions.
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## Conclusion: India's Shift from Energy Anxiety to Energy Assurance

India's approach to energy has evolved from dependency to resilience. Through **policy innovation**,

**infrastructure growth**, and a strong push toward **renewables**, India is building a **secure and sustainable energy ecosystem** that aligns with its **development goals** and **international climate commitments**.

Dr. Shivakumar's



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