



KAMARAJ IAS ACADEMY
Only IAS Academy by Grandson of "Perunthalsivam Kamarajar"

ENERGY SOVEREIGNTY FOR INDIA

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Introduction

Energy sovereignty refers to a nation's ability to secure, produce, and manage its energy resources in a manner that ensures reliability, affordability, sustainability, and minimal dependence on external sources. For India — the world's third-largest energy consumer (IEA, 2024) — achieving energy sovereignty is essential to meet its developmental aspirations, fulfill climate commitments, and safeguard national security.

Importance of Energy Sovereignty for India

1.Strategic Autonomy & National Security

Reduces vulnerability to external supply shocks and geopolitical crises.

Example: Russia–Ukraine war (2022) disrupted global crude supplies; India diversified sources and increased Russian imports to safeguard domestic needs.

2.Economic Stability

Cuts foreign exchange outflow on oil/gas imports (~\$150 billion annually).

Example: Rupee payments for Russian crude and renewable energy expansion help reduce dollar dependence.

3.Price Stability & Inflation Control

Domestic energy capacity buffers India against global crude price volatility.

Example: OPEC+ production cuts in 2023 triggered price hikes, but India cushioned the impact via discounted Russian oil.

4.Support for Sustainable Development Goals

Energy sovereignty underpins universal access, affordability, and climate commitments.

Example: Saubhagya scheme achieved 99% household electrification; Renewable energy share crossed 180 GW (2024).

5.Climate Commitments & Green Growth

Aligns with India's net-zero by 2070 pledge and 500 GW renewable target by 2030.

Example: National Green Hydrogen Mission (2023) promotes clean fuel independence.

6.Rural & Agricultural Empowerment

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Ensures reliable power for irrigation, rural households, and agro-processing.

Example: PM Kusum Scheme enables farmers to install solar pumps, reducing diesel dependency.

7.Industrial Competitiveness & Energy Security for Growth

Stable, affordable energy supply is crucial for Make in India, EVs, and Digital India.

Example: Production-Linked Incentive (PLI) scheme for solar modules and advanced chemistry batteries reduces reliance on China.

8.Resilience to Global Supply Chain Disruptions

Reduces overdependence on critical imports (solar PV modules, lithium batteries).

Example: India–Australia Critical Minerals Partnership (2023) secures lithium and cobalt supply.

Challenges to Energy Sovereignty in India

1.High Import Dependency

India imports ~85% of crude oil and ~50% of natural gas.

Example: In FY 2023–24, crude oil imports cost over \$160 billion, exposing India to external shocks.

2.Volatile Global Prices

Crude price swings strain fiscal deficit and inflation.

Example: OPEC+ output cuts in 2023 pushed Brent crude above \$90/barrel, increasing India's import bill.

3.Overdependence on Specific Regions

West Asia supplies >60% of India's crude needs.

Example: Ongoing conflict in the Middle East (2023–25) threatens supply routes in the Strait of Hormuz.

4.Coal Dominance vs. Climate Goals

Coal still generates ~55% of electricity, conflicting with net-zero 2070 targets.

Example: Power shortages in 2022 forced record coal imports despite green transition plans.

5.Renewable Energy Intermittency

Solar and wind are weather-dependent; lack of storage infrastructure creates reliability issues.

Example: Grid instability in Rajasthan and Gujarat (2023) due to sudden fall in wind generation.

6.Technology Dependence on Foreign Players

Imports dominate in solar PV modules (~75% from China), lithium-ion batteries, and electrolyzers.

Example: In 2023, India imported solar equipment worth over \$3 billion from China.

7.Critical Mineral Shortages

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India lacks domestic reserves of lithium, cobalt, nickel required for EVs and batteries.

Example: Lithium discovery in J&K (2023) is promising but not yet commercially viable.

8. Infrastructure Bottlenecks

Transmission losses (~18%), inadequate storage, and delays in pipeline/grid expansion.

Example: Renewable projects in Ladakh face delays due to lack of transmission lines to mainland grids.

Way Forward

1. Diversify Import Sources – Reduce overdependence on West Asia by strengthening ties with Africa, Latin America, and Central Asia.
2. Invest in Storage & Grid Modernisation – Smart grids, pumped hydro, large-scale battery storage.
3. Accelerate Green Hydrogen Economy – Incentivise R&D, establish global hydrogen value chains.
4. Localise Critical Minerals Supply Chain – Secure lithium, cobalt, and nickel through strategic reserves and overseas asset acquisitions.
5. Strengthen International Partnerships – IEA, ISA (International Solar Alliance), I2U2 for technology and finance.
6. Just Energy Transition – Balance coal phase-down with employment security in coal-dependent regions

Conclusion

Energy sovereignty is not merely about self-sufficiency but about resilience, sustainability, and strategic flexibility. For India, it is a critical enabler of Atmanirbhar Bharat, green growth, and a secure future in a geopolitically volatile world. By harnessing renewables, diversifying imports, investing in technology, and ensuring inclusive access, India can truly achieve energy sovereignty while honoring its developmental and climate commitments.