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Introduction

Welcome to the Indian Journal of Legal Affairs and Research (IJLAR), a distinguished platform dedicated to the dissemination of comprehensive legal scholarship and academic research. Our mission is to foster an environment where legal professionals, academics, and students can collaborate and contribute to the evolving discourse in the field of law. We strive to publish high-quality, peer-reviewed articles that provide insightful analysis, innovative perspectives, and practical solutions to contemporary legal challenges. The IJLAR is committed to advancing legal knowledge and practice by bridging the gap between theory and practice.

Preface

The Indian Journal of Legal Affairs and Research is a testament to our unwavering commitment to excellence in legal scholarship. This volume presents a curated selection of articles that reflect the diverse and dynamic nature of legal studies today. Our contributors, ranging from esteemed legal scholars to emerging academics, bring forward a rich tapestry of insights that address critical legal issues and offer novel contributions to the field. We are grateful to our editorial board, reviewers, and authors for their dedication and hard work, which have made this publication possible. It is our hope that this journal will serve as a valuable resource for researchers, practitioners, and policymakers, and will inspire further inquiry and debate within the legal community.

Description

The Indian Journal of Legal Affairs and Research is an academic journal that publishes peer-reviewed articles on a wide range of legal topics. Each issue is designed to provide a platform for legal scholars, practitioners, and students to share their research findings, theoretical explorations, and practical insights. Our journal covers various branches of law, including but not limited to constitutional law, international law, criminal law, commercial law, human rights, and environmental law. We are dedicated to ensuring that the articles published in our journal adhere to the highest standards of academic rigor and contribute meaningfully to the understanding and development of legal theories and practices.

ROLE OF HYDRO POWER IN BUILDING A VIKSIT BHARAT BY 2047

AUTHORED BY - TANVEEN KAUR

Introduction

India's energy transition is increasingly being celebrated as a story of scale. Installed renewable capacity has crossed 260 Gega Watt, and non-fossil sources now account for over half of total installed power capacity. [1] Electricity systems do not run on installed capacity; they run on reliable generation at the right time, which is dispatched when there is demand or energy needs to be stored. By that measure, India's transition remains structurally incomplete. Thermal power continues to supply more than 70 percent of actual electricity generation and dominates evening and night-time peaks.[2]

Renewable energy curtailment is rising in high-capacity states due to grid constraints. Simultaneously, financially stressed distribution companies continue to lock in long-term coal-based power purchase agreements to hedge against supply uncertainty.[3]

What emerges is a paradox: a system that is green in capacity, but still fossil in function.
This gap between capacity and system reliability is not a technical aberration; it is a structural outcome of how India's power sector is governed. The decisive levers of the transition—land allocation, intra-state transmission, procurement strategies, tariff design—sit with states, not the Centre. Yet, the geography of the transition is deeply uneven.

Transition is not merely a climate imperative; it is a question of economic viability, fiscal stability, and energy security.

[1] Ministry of New and Renewable Energy, Government of India, https://www.pib.gov.in/PressReleasePage.aspx?PRID=2209478
[2] Centre for Research on Energy and Clean Air, *India Power Sector Overview FY 2024–25: Thermal Generation Growth Slowest Since COVID*, CREA, 2025, https://energyandcleanair.org/publication/india-power-sector-overview-fy-2024-25/.
[3] Central Electricity Authority, *National Generation Adequacy Plan 2026–27 to 2035–36*, Government of India, 2026, https://cea.nic.in/wp-content/uploads/notification/2026/03/Generation_Adequacy_Plan_2035_36.pdf.

This divergence creates a deeper systemic risk. An energy transition that advances unevenly across states risks producing a two-speed India: one that attracts green capital, new industry, and infrastructure, and another that remains burdened by stranded assets, and rising political resistance.

Despite this, most existing assessments of India's energy transition remain either capacity-centric or nationally aggregated, offering limited insight into whether states are institutionally and systemically prepared to deliver the next phase of the transition: reliable, round-the-clock renewable energy.[4]

Power Sector Ecosystem in India

India's power sector is a multi-layered system where generation, transmission, distribution, markets, regulation, and finance are institutionally distinct but functionally interdependent. Its structure reflects a vertically unbundled architecture, yet one where outcomes are determined by the coherence across these layers.

At the upstream end, electricity generation is undertaken by a mix of central public sector undertakings, state-owned utilities, and private developers, drawing on a diversified energy base that includes coal, hydro, nuclear, and an expanding portfolio of renewable sources. While capacity addition has accelerated, particularly in renewables, the operational profile of generation remains anchored in thermal power, reflecting the system's continued dependence on dispatchable baseload for reliability.

Transmission forms the backbone that connects generation centres to demand nodes. A centrally coordinated national grid, supported by interstate and intrastate transmission networks, enables power flows across regions. Real-time system balancing and grid discipline are maintained through a layered load dispatch architecture, ensuring frequency stability and reliability in an increasingly complex generation mix.[5]

At the consumer interface lies the distribution segment, dominated by state-owned distribution

[4] JMK Research, "India Installed 29.5 GW of Solar and 4.96 GW Wind Capacity in the First Nine Months of 2025," 2025, https://bluebirdsolar.com/blogs/all/india-installed-29-5-gw-of-solar-and-4-96-gw-wind-capacity-in-the-first-nine-months-of-2025.
[5] Ministry of Power, Government of India, "Power Grid," https://powermin.gov.in/en/content/power-grid.

companies, alongside select private operators in urban centres.

Overlaying these physical layers is an evolving electricity market architecture. Power exchanges, bilateral contracts, and open access mechanisms are gradually introducing competitive price discovery and enabling greater participation of large consumers in procurement decisions.

The entire ecosystem is governed through a federal regulatory framework. While the central government sets broad policy direction, the decisive levers—tariff setting, procurement approval, grid planning, and market access—reside with state-level regulators. Financial institutions further underpin the system by enabling capital flows into generation, transmission, and distribution infrastructure. Taken together, the Indian power sector is not merely a technical system but an institutional one, where outcomes are shaped less by individual components and more by the alignment—or misalignment—across them. As the energy transition advances, this interdependence becomes more pronounced, the shift to clean energy is no longer a question of adding capacity, but of reconfiguring how these layers interact to deliver reliable, affordable, and low-carbon power.

Policy Recommendations

- Increase the power import capability of each state to at least 60% of its peak demand. This approach ensures that states with limited generation capacity can meet their electricity needs by importing power from other regions or neighbouring States and union territories should establish land banks based on on-ground validation. States and union territories should create graded land banks for various projects to accelerate India's energy transition.
- Ensure the total transfer capability of states are greater. The ratio of a state to its requirement should be greater than 100% to ensure that power can be transferred without affecting security. This ratio can also be used to evaluate access performance and plan future expansion.
- Connectivity approvals often face bottlenecks due to overlapping regulatory requirements, which can increase the financial burden on developers. As of 2023, connectivity delays have impacted nearly 20% of the projects, underscoring the need for streamlined processes.

- India has developed the National Single Window System, a digital platform designed to streamline the process for businesses and investors seeking approvals and clearances. Launched in September 2021, the NSWS aims to serve as a one-stop shop, integrating approvals across various central departments and state governments. There is a need for renewable energy industry to provide feedback to enhance the system's effectiveness.
- A Power Council, similar to the Goods and Services Tax Council, should be established to promote coordinated policy development and implementation across states in the power sector. This would facilitate the resolution of inter-state challenges, create a unified regulatory framework, and ensure that reforms are consistently applied. By fostering collaboration, the council would support the sector's efficiency and sustainable growth, aligning state-level actions with national objectives.
- Reactive transmission planning and substation construction delays are causing commissioning delays. Completion time for transmission is less than 2.5 years vs 1.5 year for renewable energy projects. Aligning transmission upgrades with these project timelines is essential. A coordinated effort between central and state utilities to synchronize infrastructure with these projects can help. Additionally, investing in transmission specifically in renewable energy rich regions, along with smart grid technologies, will enhance resilience and accommodate fluctuating supply.
- In India, a significant part of renewable energy project is delayed due to the lack of Power Purchase Agreements between Renewable Energy Implementing Agencies and developers. This delay hinders progress towards the nation's renewable energy goals and affects compliance with Renewable Purchase Obligations. To address this issue, a "deemed approval" mechanism, where Power Purchase Agreements are automatically considered approved after a specified period, could also be implemented.[6]

Conclusion

Companies must continue to innovate and integrate sustainability into their core strategies, leveraging green technologies and enhancing transparency in climate disclosures. They must leverage their company's opportunities and strengths and engage with the right pools of capital to raise green finance. Private investors have a crucial role in this transition, not only by

[6] Scenarios towards Viksit Bharat and Net Zero report by NITI AAYOG

diversifying their portfolios with green assets but also by venturing into riskier (than usual) investments that have long-term environmental impact and financial returns. They should consider investing across a company's lifecycle and engage with blended finance instruments to balance risk and reward. Development Finance Institutions are tasked with the critical function of de-risking investments in the green sector. By offering guarantees and other financial instruments, one can provide the assurance needed to spur private sector investment into climate technologies and essential infrastructure. Venture capital firms have the distinct opportunity to fuel innovation by supporting early-stage green startups, thus seeding the market with transformative solutions that can scale.

Private equity, with its substantial capital reserves and long-term investment horizon, is strategically positioned to fund large-scale green infrastructure projects, playing a pivotal role in the energy transition narrative. The stakeholders need to work together not only to meet climate targets but also to take advantage of the economic opportunities that come with this transition. To access these opportunities, they must be prepared and make deliberate collective efforts. By aligning their actions towards a common goal, stakeholders can unlock the full potential of climate aligned capital. This will drive India towards a greener and more resilient future, making it an attractive destination for climate-focused capital.