



States' Role in Energy Transition

This editorial is based on [Seeing India's energy transition through its States](#) which was published in The Hindu on 07/06/2023. It talks about the role of states in India's renewable energy transition journey.

Prelims: [PM KUSUM](#), [Solar Energy](#), [Renewable Energy](#),

Mains: Role of States in Energy Transition - Challenges and Way Forward

India is planning to propose a multiple energy pathways approach to accommodate the diverse contexts and development trajectories of countries. The diversity of India's States, which necessitates multiple pathways, will determine its own domestic energy transition. India's global climate pledges — 50% non-fossil electricity generation capacity by 2030 and net-zero emissions by 2070 — are backed by domestic energy targets at the national level.

States are critical actors in India's energy transition as there is a multi-tier governance of energy production and usage. An effective transition will require bridging the ambitions and implementation gaps between the Centre and the States. Simultaneously, national ambitions need to factor in the varying incentive structures, processes, and institutional capacities at the State level.

Why States matter?

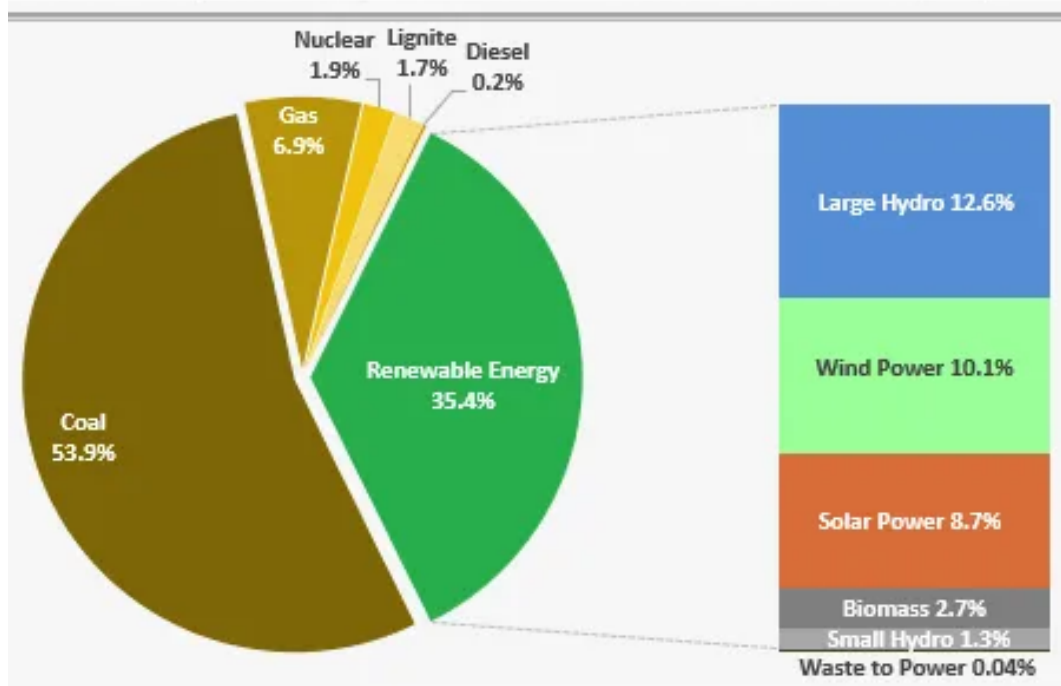
- **Critical to the Realisation of National Targets:** States as spheres of implementation are critical to the realisation of national targets. While the Centre may set goals, and use carrots and sticks to help achieve them, the realisation of these goals often depends on how they are aligned with State priorities and capabilities.
- **Crucial for an Inclusive Development:** India's progress towards its 175 GW [renewable energy](#) target is complex. Only three states met their individual targets, and 80% of current renewable energy capacity is in six states in the west and south. An inclusive approach involving all states is necessary for a successful clean energy transition.
- **Energy Policy Formulation:** States can customize their renewable energy policies to meet their unique energy requirements and resources. **Renewable energy targets, incentives, and regulations can be designed to promote clean energy adoption based on local conditions.**
 - Moreover, Unresolved electricity sector issues, such as high losses and unreliable supply, may worsen during the clean energy transition. State-level solutions are needed as these issues are embedded in the State political economy.
- **Renewable Energy Potential:** India's diverse geography and climate lead to varying renewable energy resources across states. **States can leverage their specific resources, such as solar, wind, or hydroelectric, to set up projects, attract investments,** and contribute to the country's renewable energy capacity.

- **Laboratories of Policy Innovations:** States have been instrumental to policy innovations related to India's energy transition. For example, early initiatives by Gujarat and Rajasthan on solar, and Maharashtra and Tamil Nadu on wind energy technologies, have contributed significantly to renewable energy uptake at the national level.
 - Similarly, [PM KUSUM](#) is an adoption of successful State experiments on the solarisation of agriculture at a national scale.
- **Roadblocks to National Goals:** While States have the power to promote clean energy adoption, they could also become roadblocks to national goals, especially if the goals are perceived to conflict with State priorities.
 - For example, a coal-dependent State may resist phasing out coal-fired power plants. Achieving national clean energy targets may be difficult without the cooperation of all States.
- **Demand-Side Management:** States can control demand-side management strategies as major energy consumers. **They can promote energy efficiency measures, smart grid technologies, and energy conservation practices at the local level.** States can also incentivize the use of electric vehicles, rooftop solar installations, and energy-efficient building designs.
- **Collaboration and Knowledge Sharing:** States can collaborate with each other, share best practices, and learn from successful initiatives. Forums like the National Institution for Transforming India (NITI Aayog) and other state-level agencies facilitate knowledge sharing, allowing states to benefit from the experiences and lessons of others.

What are the Challenges?

- **Varying Renewable Energy Potential:** States have varying renewable energy potential, making it difficult to balance contributions and targets. Some states have more capacity to contribute to the renewable [energy mix](#) than others.
- **Policy Variations:** States have their own energy policies, causing differences in approaches and targets. Aligning policies and creating a coordinated framework can be challenging.
- **Financial Disparities:** States in India have varying levels of financial resources, making it challenging for some states to invest in renewable energy projects. The availability of funding mechanisms and access to capital also differ among states.
- **Technical Capacity:** The technical capacity and expertise required for planning, implementing, and operating renewable energy projects may vary among states. Some states may have a more developed renewable energy sector and technical know-how, while others may lack the necessary expertise.
- **Infrastructure Readiness:** Grid infrastructure varies across states and needs upgrading to integrate renewable energy. Some states may face challenges due to limited resources.
- **Political Will and Administrative Efficiency:** Uniform energy transition needs political will and administrative efficiency across states. Differences in priorities and capabilities can affect the pace and effectiveness. Coordination among states is crucial for success.
- **Regional Interests and Priorities:** Each state has its own unique set of regional interests and priorities, which may sometimes conflict with the broader national goals. Balancing regional and national interests in the energy transition is complex and requires effective negotiation and consensus-building among states.
- **Stakeholder Engagement:** Involving stakeholders is crucial for a successful energy transition. To address their concerns and promote cooperation, inclusive and participatory processes must be designed, especially since perspectives and interests may differ across states.

India - Cumulative Installed Power Capacity Mix (%)



What should be the Way Forward?

- **A State-level framework:** As a complement to the techno-economic discourse, there is a need for a State-level framework to understand plans, actions, and governance processes towards an energy transition. Applying such a framework will enable an expedited transition in multiple ways.
 - It broadens the transition discourse from a narrow set of outcomes to include processes that shape outcomes. Understanding the effects of transitions on transparency, accountability, affordability, and reliability is crucial.
 - It leads to greater transparency which could enable participation of stakeholders in the processes and ensure public legitimacy and buy-in to complex decisions.
 - State preparedness leads to better understanding of state-level differences and helps make evidence-based policy choices for a practical and faster energy transition.
- **National Renewable Energy Policy Framework:** Create a national renewable energy policy framework that guides states to align their policies with national goals, while addressing state-specific challenges and promoting coordination and consistency.
- **Capacity Building and Knowledge Sharing:** Invest in capacity building to enhance technical expertise and knowledge-sharing among states. This can include training, workshops, conferences, and collaborative research projects.
- **Financial Support Mechanisms:** Ensure fair access to funds, establish mechanisms to bridge financial gaps between states. Options include creating funds for renewable energy projects, incentivizing private sector investments, and facilitating access to low-cost financing.
- **Standardization and Harmonization:** Encourage standardization and harmonization of policies, regulations, and technical standards across states. This can promote consistency, reduce complexity, and facilitate smoother inter-state project implementation and grid integration.
- **Grid Infrastructure Development:** Focus on strengthening and modernizing grid infrastructure, particularly in states with high renewable energy potential. Upgrading transmission and distribution systems, implementing advanced grid management technologies, and establishing robust inter-state transmission networks can support the integration of renewable energy sources.
- **Institutional Coordination and Collaboration:** Strengthen institutional coordination and collaboration between the central government, state governments, regulatory bodies, and other stakeholders. Establish dedicated platforms or task forces that facilitate regular communication, exchange of ideas, and coordination on energy transition-related matters.
- **Inclusive and Just Transition:** Ensure that the energy transition takes into account the social and economic aspects, particularly in regions heavily dependent on fossil fuel-based industries.

Implement measures to support the affected communities, provide alternative livelihood opportunities, and ensure a just and equitable transition for all.

What are Some State Governments' policies w.r.to Renewable Energy?

- **Andhra Pradesh has its Renewable Energy Export Policy 2020** for solar, wind, and wind-solar hybrid projects. The policy aims to promote the export of renewable energy outside the state without any obligation of power procurement by state distribution companies (DISCOMs).
- **Gujarat has a Solar Power Policy 2021**, which offers benefits such as exemption from electricity duty, banking facility, waiver of cross-subsidy surcharge, etc. for solar power projects.
- **Karnataka's Renewable Energy Policy 2022-2027** which aims to facilitate development of 10 (Ten) GW of additional RE projects with or without energy storage systems in the State.
- **Tamil Nadu's Solar Energy Policy 2019**, which targets to achieve 9 GW of solar power by 2023, with provisions for grid-connected and off-grid projects, rooftop solar systems, solar parks, etc.

Conclusion:

While India has set laudable goals for its energy transition and has been working towards creating incentives and enforcement mechanisms, a critical next step is to engage with diverse State contexts, capabilities, and priorities. These are shaped by the interplay between multiple drivers, barriers, and enablers, including available techno-economic options, fiscal space, and social and political imperatives.

Drishti Mains Question:

States have a crucial role to play in India's energy transition journey. Discuss the challenges associated with the role of states in India's energy transition and suggest measures to overcome them.

UPSC Civil Services Examination Previous Year Question (PYQ)

Mains

Q. India has immense potential of solar energy though there are regional variations in its developments. Elaborate (2020)