



# INDIAN NATIONAL CLIMATE POLICY IMPLEMENTATION – A BRIEF REVIEW

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## Key Insights

- (a) Policy design issues are the most significant barrier to the implementation of Indian climate policies, followed by (b) weak vertical coordination, (c) gaps in data, communication, and information systems, (d) inadequate technological readiness, (e) inconsistent legal enforcement and compliance, and (f) competing policy goals.
- Policies require clearer implementation pathways, defined institutional responsibilities, and measurable targets.
- India's federal structure demands better alignment between central targets and state-level enforcement.
- A unified digital Monitoring, Reporting, and Verification (MRV) platform is needed to track compliance across policies.
- Public procurement and R&D incentives need to be aligned in order to foster domestic manufacturing of critical technologies.

- Transitioning from voluntary or incentive-based schemes to enforceable mandates is essential.
- Balancing climate ambition with developmental and energy-security objectives requires cross-sectoral planning instruments that internalize trade-offs early in the policy cycle.

## Introduction and Methodology

In furtherance of, and in addition to, its three stated Intended Nationally Determined Contribution (INDC) targets – (a) reduce emissions intensity of the economy 45% below 2005 levels by 2030, (b) increase the installed capacity of non-fossil fuel energy to 50%, and (c) create an additional carbon sink of 2.5 to 3 Billion tonnes by 2030 – India has a broad range of climate policies that can be classified into the following sectors: (a) economy wide, (b) energy, (c) forestry, (d) energy efficiency, industry, and buildings, and (e) transportation. The policy

**Table 1: Selected Policies for Implementation Gap Analysis - India**

Sector	Policies
Economy-wide	National Green Hydrogen Mission
	Emission standards for coal fired power plants
	GST coal compensation cess
	National Solar Mission
	Wind-Solar Hybrid Auction
	Viability Gap Funding Scheme under the Jawaharlal Nehru National Solar Mission Phase II
	Viability gap funding for development of Battery Energy Storage Systems (BESS)
Energy	Renewable Energy Certificates (RECs) and Renewable Portfolio Obligations (RPOs)
	Accelerated Depreciation Tax Benefit for wind and solar energy
	Inclusion of green finance under RBI's Priority Sector Lending
	National Offshore Wind Energy Policy
	National Smart Grid Mission
	Ujwal DISCOM Assurance Yojana (UDAY)
	Green Energy Corridor Project
Forestry	National Mission for a Green India
	Finance Commission Incentive for Creation of Carbon Sink
	INDC Target on Forestry – carbon sink of 2.5 to 3 GtCO <sub>2</sub> e through additional forest and tree cover by 2030
Energy Efficiency, Industry, & Buildings	National Mission for Enhanced Energy Efficiency
	Perform, Achieve, and Trade (PAT)
	National Program on Energy Efficiency and Technology Upgrade of MSMEs
	India Cooling Action Plan
	Energy Conservation Building Code for Residential Buildings
	Energy Conservation Building Code for Commercial Buildings
	Green Steel Taxonomy for India
India Green Steel Roadmap and Action Plan	
Transport	National Electric Mobility Mission Plan
	Faster Adoption and Manufacturing of (Hybrid)and Electric Vehicles (FAME) I and II
	Corporate Average Fuel Efficiency (CAFÉ) standards
	Bharat Stage (BS) pollution emission standards for cars and two wheelers
	Bharat Stage (BS) pollution emission standards for heavy duty vehicles

instruments used are diverse, ranging from fiscal policies such as the Coal Compensation Cess<sup>1</sup> and the Finance Commission's incentive to states for the creation of a carbon sink, and regulatory policies such as the Bharat Stage emission standards for passenger vehicles, to market-based mechanisms such as the Carbon Market Framework and Carbon Credit Trading Scheme. All put together, the large portfolio of policies (Table 1) attempts to achieve a range of objectives in addition to the reduction of emissions, including fostering innovation and structural change towards a green economy and incentivizing investments in climate adaptation.

A recent paper by the Climate Policy Lab<sup>2</sup> found that under a business-as-usual scenario with current policies, India's emissions will not reach net zero by 2070. The paper evaluated possible net zero pathways but did not study whether and how implementation gaps may hinder the achievement of climate goals. Despite some notable successes, such as in the cases of the expansion of installed solar capacity through the National Solar Mission and the widespread adoption of emission standards for passenger vehicles due to the Bharat Stage regulations, evidence on whether the country has been able to meet its climate policy goals is inconsistent. This policy brief provides a summary of findings from the Climate Policy Lab's ongoing Implementation Gap Analysis project on India that attempts to fill the aforementioned gap in the literature. This project's research design involves the combination of a comprehensive literature review with semi-structured interviews with climate policy experts in order to ascertain the implementations status of the policies being studied and the nature of implementation gaps that may affect them based on a policy gap typology created for this purpose with 17 different policy gaps broadly classified into four groups: (a) governance and institutional capacity, (b) political economy and interests, (c) financial

constraints, (d) technical and legal constraints. The 31 policies under study have been chosen based on their identification as India's most important climate policies during the Climate Policy Lab's India Policy Gap Analysis project.

## Key Findings

Preliminary findings, based on a literature review and 5 expert opinions, reveal that (a) policy design is most commonly cited as an implementation gap, with it being cited for 20 policies, followed by (b) vertical coordination – 12 policies, (c) data, communications, and information – 11 policies, (d) technology – 10 policies, (e) legal mechanisms – 9 policies, and (f) competing goals – 9 policies (see Figure 1). The definitions of each of these gaps according to the Implementation Gap Analysis framework are found in the Appendix.

The heatmap (Figure 2) visualizes where literature and stakeholder interviews converge in identifying policy implementation gaps. Each point reflects one source – either the literature or an individual interviewee – flagging a specific gap. Policies with no identified gaps were excluded from the figure; however, this absence reflects the scope of the sources consulted and should not be interpreted as evidence that no gaps exist.

## POLICY DESIGN

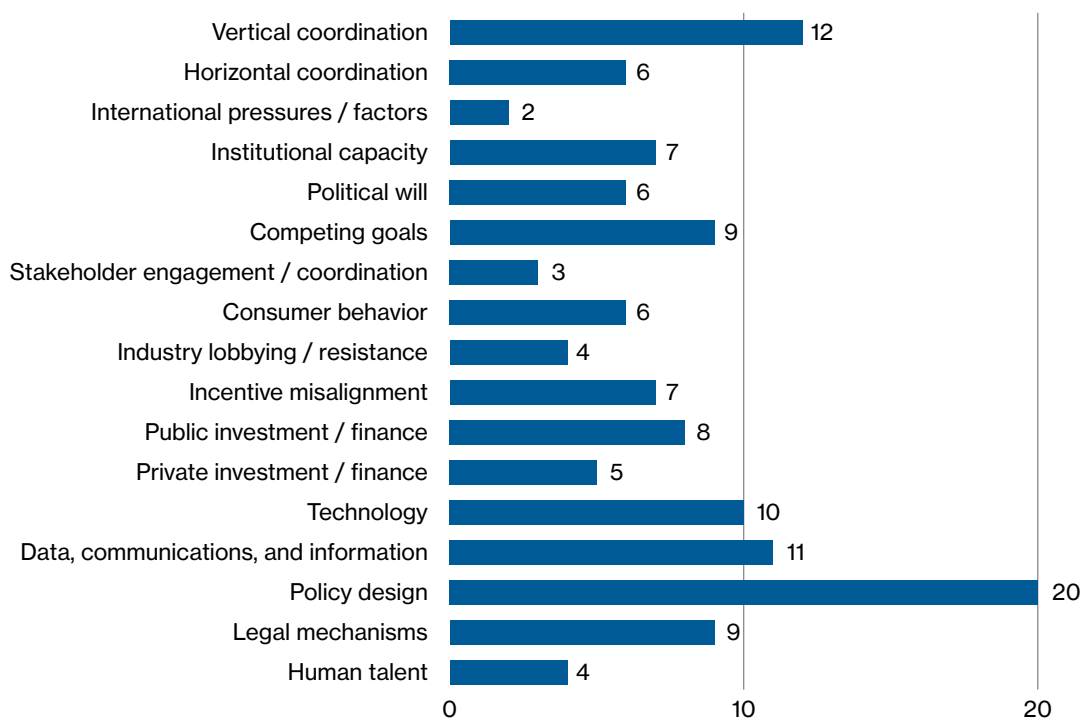
Problems with policy design were found to impact the majority – 20 out of 31 – of policies studied.<sup>3</sup> The strongest evidence was found with respect to (a) the National Green Hydrogen Mission, (b) Thermal Plant Emission Standards, (c) the National Solar Mission, (d) the Wind-Solar Hybrid Auction policy, (e) Renewable Energy Certificates (RECs) and Renewable Purchase Obligations (RPOs), (f) the National Mission for a Green India, (g) the Perform, Achieve, and Trade (PAT) scheme, (h) India Cooling Action Plan, (i) National Electric Mobility Mission Plan, and (j) Corporate Average Fuel Efficiency standards.

1 A tax of INR 400 per tonne of coal.

2 Narassimhan et al., 'Is Net Zero Net Positive? – Opportunities and Challenges for Pursuing a Socio-Economically Sensitive Net-Zero Transition for India', *Climate Policy* 25, no. 7 (2025): 1029–43. <https://doi.org/10.1080/14693062.2024.2432931>

3 'Strongest evidence' is defined for the purposes of this memo as policies that were identified as falling within the respective implementation gap by either (a) the literature review and one or more interviewees or (2) two or more interviewees

**Figure 1: Number of policies that each implementation gap affects**



The National Green Hydrogen Mission reflects strong ambition but limited planning for market creation. By focusing largely on supply-side measures, the policy overlooks mechanisms to generate domestic demand, such as credit systems, purchase mandates, or long-term offtake agreements. Combined with the higher cost of green hydrogen and a complex regulatory landscape across states, this deters private investment and risks, confining the sector to export markets. Similarly, the Thermal Power Plant Emission Standards lack clarity on cost recovery and tariff treatment, discouraging compliance as plants face higher marginal costs and operational uncertainty. Even with adequate raw materials such as limestone, the absence of systems to ensure consistent supply reflects gaps in the supporting policy framework.

The National Solar Mission and related instruments also illustrate how design misalignment can undermine implementation. Renewable projects are often completed long before the required transmission infrastructure, delaying deployment and reducing investor confidence. The policy's focus on large-scale

generation has left rooftop solar lagging due to weak net metering and grid integration incentives. The Wind-Solar Hybrid Auctions highlight procedural weaknesses, with no uniform eligibility or land acquisition criteria leading to speculative, non-viable bids. Market and incentive schemes such as Renewable Purchase Obligations (RPOs) and Renewable Energy Certificates (RECs) suffer from weak enforcement and misaligned incentives, while the Green India Mission and PAT program combine ambitious targets with inconsistent timelines and limited follow-through. The National Electric Mobility Mission Plan similarly sets aspirational goals without the supporting infrastructure or accountability mechanisms to realize them.

### **VERTICAL COORDINATION**

Problems with vertical coordination were found to impact 12 out of 31 policies studied. The strongest evidence was found with respect to (a) the National Solar Mission, (b) RECs and RPOs, and (c) the Energy Conservation Building Codes for Residential (ECBC-R) and Commercial Buildings (ECBC-C).

**Figure 2: Heatmap of Policy Gaps Identified by Literature and Interviewees**

Each point represents one source – either the literature or an individual interviewee – identifying a policy gap.

	Vertical coordination	Horizontal coordination	International pressures / factors	Institutional capacity	Political will	Competing goals	Stakeholder engagement / coordination	Consumer behavior	Industry lobbying / resistance	Incentive misalignment	Public investment / finance	Private investment / finance	Technology	Data, communications, and information	Policy design	Legal mechanisms	Human talent
National Green Hydrogen Mission	1				1	3				1	1	1	4		2		1
Thermal Plant Emission Standards	1	2		1	3	2	1		5	1	2	1			3	1	
GST Coal Compensation Cess															1		
National Solar Mission (NSM)	4	2				1	1			2			2		4	1	
Wind - Solar Hybrid Auction															2		
VGF for Development of Battery Energy Storage Systems												1					
RECs and RPOs	3	1			1	1		1						1	2	2	
Accelerated Depreciation Tax Benefit															1		
National Offshore Wind Energy Policy	1	1		1									1		1		
National Smart Grid Mission													1	1	1		1
Ujwal DISCOM Assurance Yojana (UDAY)				1	2			2			1			1	1		1
Green Energy Corridor Project																	1
National Mission for a Green India											1				2		
Finance Commission Carbon Sink Incentive	1					1									1		
Indian INDC Target on Forestry – 2.5 to 3 GtCO <sub>2</sub> e carbon sink by 2030	1						1				1			1	1		
National Mission for Enhanced Energy Efficiency					1	1				1		1		1	1		1
PAT (Perform, Achieve, and Trade)				1		1			1					2	2	1	
India Cooling Action Plan	1					1		1			1		1	1	2		
Energy Conservation Building Code – Residential Buildings	2	1		2						1				2		1	
Energy Conservation Building Code – Commercial Buildings	2	1		2										1		1	
Green Steel Taxonomy for India			1						1				1	1			
India Green Steel Roadmap and Action Plan			1			1			1			1	2	1	1		
National Electric Mobility Mission Plan								1			1		2		2	2	
Faster Adoption and Manufacturing of (Hybrid) and Electric Vehicles (FAME) I and II	1										1		1		1		
Corporate Average Fuel Efficiency (CAFÉ) standards										1					2	1	
Bharat Stage (BS) pollution emission standards for cars and two wheelers	1			1	1			2									
Bharat Stage (BS) pollution emission standards for heavy duty vehicles								1		1			1				

In the National Solar Mission, the central government's targets are constrained by uneven state-level implementation capacities, poor financial health of DISCOMs, and a lack of subnational policies for grid flexibility or rooftop solar compensation. In the case of the RECs and RPOs framework discoms are rarely penalized for non-compliance, and regulators are reluctant to enforce penalties. Similarly, the Energy Conservation Building Codes (ECBC) for both residential and commercial buildings reveal institutional misalignment: while national ministries are increasingly aware of policy frameworks, subnational agencies often lack capacity or technical knowledge to implement them effectively.

### **DATA, COMMUNICATION, AND INFORMATION (DCI)**

Problems with DCI were found to impact 11 out of 31 policies studied. The strongest evidence was found in respect of (a) PAT and (b) ECBC-R.

The PAT scheme has achieved relatively strong monitoring among large industries, but data collection from Medium Small & Micro Enterprises (MSMEs) remains inconsistent and often relies on self-reporting. Monitoring and verification systems for smaller enterprises are weak, and lobbying has contributed to lenient performance targets. Similarly, the Energy Conservation Building Code (Residential) faces severe monitoring challenges due to the fragmented and largely informal nature of India's construction industry. Without robust data systems and effective information flows between implementing agencies, compliance tracking remains limited, hampering feedback and learning across levels of governance.

### **TECHNOLOGY**

Problems with technology were found to impact 10 out of 31 policies studied. The strongest evidence was found with respect to (a) the National Green Hydrogen Mission, (b) National Solar Mission, (c) Green Steel Roadmap and Action Plan, and (d) the National Electric Mobility Mission Plan.

The National Green Hydrogen Mission depends heavily on advances in connected technologies,

particularly electrolyzers, which remain expensive, inefficient, and largely imported. The absence of domestic manufacturing capacity, coupled with underdeveloped infrastructure for storage, transport, and refueling, constrains large-scale deployment and raises costs. While hydrogen production is technically feasible, scaling it for widespread use faces persistent challenges related to cost, supply chains, and infrastructure readiness. Similarly, the National Electric Mobility Mission Plan struggles with weak technological ecosystems. Battery recycling and circular economy systems are underdeveloped, charging networks remain fragmented, and the lack of standardization across charging technologies has slowed mass adoption.

### **LEGAL MECHANISMS**

Problems with legal mechanisms were found to impact 9 out of 31 policies studied. The strongest evidence was found in respect of (a) RECs and RPOs and (b) the National Electric Mobility Mission Plan.

Weak enforcement mechanisms continue to undermine India's climate policy architecture. The RPO and REC framework illustrates systemic failures in compliance and penalty enforcement. Although both central and state regulations exist, monitoring remains irregular, and penalties for non-compliance are minimal or inconsistently applied. The National Electric Mobility Mission Plan similarly reflects a compliance culture rooted in voluntary aspiration rather than binding obligations. The lack of enforceable targets and failure to implement the 15-year vehicle retirement rule further demonstrate limited legal follow-through.

### **COMPETING GOALS**

Problems with competing goals were found to impact 9 out of 31 policies studied. The strongest evidence was found in respect of (a) the National Green Hydrogen Mission and (b) Thermal Plant Emission Standards.

In the case of the National Green Hydrogen Mission, the drive to expand hydrogen production competes with the need to allocate limited renewable electricity to other industrial or consumer uses. Given the high carbon intensity

of the grid, prioritizing hydrogen production could exacerbate short-term emissions. Similarly, the Thermal Power Plant Emission Standards face resistance due to financial and operational trade-offs. Retrofitting plants involves costly shutdowns that risk supply disruptions and revenue losses for discoms.

## Recommendations

India's climate policy landscape demonstrates both scale and momentum but suffers from recurring implementation barriers that cut across sectors. The Implementation Gap Analysis findings provide entry points for reform:

### 1. Strengthen Policy Design and Delivery

**Frameworks:** Policies require clearer implementation pathways, defined institutional responsibilities, and measurable targets. Policies such as the National Green Hydrogen Mission would benefit from integrated demand-creation mechanisms (offtake agreements, credit frameworks) and transparent cost-recovery structures for industries and utilities. Establishing ex-ante delivery frameworks with monitoring indicators can improve accountability.

### 2. Improve Vertical and Horizontal

**Coordination:** India's federal structure demands better alignment between central targets and state-level enforcement. Creating joint federal-state implementation compacts, supported by predictable fiscal transfers and technical assistance, could bridge capacity gaps. Inter-ministerial coordination units, particularly linking energy, industry, and finance, would help synchronize timelines and investment decisions.

### 3. Enhance Data, Monitoring, and Information

**Systems:** A unified digital Monitoring, Reporting, and Verification (MRV) platform is needed to track compliance across policies. Data transparency can facilitate investor confidence and adaptive policymaking. For schemes involving MSMEs and buildings, standardized reporting templates and stronger institutional linkages between central and subnational agencies can address current information asymmetries.

### 4. Advance Domestic Technology Ecosystems:

Public procurement and R&D incentives should be aligned to foster domestic manufacturing of critical technologies such as electrolyzers, energy storage, and low-carbon industrial processes. Strengthening public-private demonstration programs and technology partnerships can accelerate cost reduction and diffusion.

### 5. Reinforce Legal and Enforcement

**Mechanisms:** Transitioning from voluntary or incentive-based schemes to enforceable mandates is essential. Revising penalty frameworks for non-compliance (such as in the RPO & REC systems) and ensuring legal clarity on dispute resolution can improve compliance culture. Judicial and regulatory capacity-building should complement this shift.

### 6. Manage Competing Goals through

**Integrated Planning:** Balancing climate ambition with developmental and energy-security objectives requires cross-sectoral planning instruments that internalize trade-offs early in the policy cycle. Conducting climate-impact assessments for major energy and industrial policies can help prevent contradictions between short-term economic priorities and long-term emissions goals. ●

# Appendix

## TYOLOGY OF IMPLEMENTATION GAPS

CATEGORIES	DEFINITION	EXAMPLES
<b>Group 1: Governance and Institutional Capacity</b>		
Vertical coordination (multilevel governance)	Alignment across national, regional, and local levels of government in climate policy objectives and implementation.	Misalignment in climate policy implementation, timeline, or targets between federal and state levels.
Horizontal coordination	Alignment among ministries and agencies at the same level of government in climate policy objectives and implementation.	Fragmented efforts and conflicting actions (e.g., competitions between ministries for resources).
International pressures/factors	International and external legal and financial/political dynamics that act as barriers.	Donor-driven conditionality (e.g., IMF or WB's conditions on aids that might restrict policy implementation); WTO rules on export subsidies.
Institutional capacity	Organizational structures, norms, rules, and human resources that enable policy delivery.	Limited expertise, bureaucratic inefficiencies, poor coordination, poor communications.
<b>Group 2: Political Economy and Interests</b>		
Political will	Commitment by political actors to support climate policy decisions and their outcomes.	Delay of policies due to vested interests in fossil fuels, partisan divides, changes in electoral cycles, lack of (or incoherent) incentives.
Competing goals	Tensions between climate objectives or other economic, political, or development objectives.	Trade-offs between emissions reduction and industrial expansion.
Stakeholder engagement/coordination	A systematic process of identifying and interacting with individuals, groups, or organizations that have a stake in a policy or project.	Public consultation held but stakeholder inputs are not integrated; local groups being excluded from decision-making.
Consumer behavior	Behavioral resistance or unintended reactions to climate policies.	Rebound effects from fuel-efficient cars leading to increased vehicle use.
Industry lobbying / resistance	Strategic actions by industries to delay, weaken, or reshape climate policies that challenge their interests.	Coal industry lobbying against early retirement of coal plants or carbon taxes.
Incentive misalignment	Conflicting incentives across climate and non-climate policies that undermine intended outcomes.	Subsidies for fossil fuels, or market-based incentives that contradict carbon pricing mechanisms.
<b>Group 3: Financial Constraints</b>		
Public investment/finance	Provision of public finance during each stage of policy implementation.	Unavailability of funds required for a project scheduled for implementation from 2015 to 2020 during the 2019–20 financial year due to a shock to the source of revenue that paid for the implementation of the policy.
Private investment/finance	Availability of and access to private finance that is required for the implementation of a policy.	Unavailability of sufficient private capital due to a poor estimation by the government of the level of risk that banks were willing to take on.

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## TYPOLOGY OF IMPLEMENTATION GAPS

Group 4: Technical and Legal Constraints		
Technology	Availability and maturity of low-carbon technologies needed.	Mismatch between policy's technological needs and the existing technological infrastructure.
Data, communications, and information	Availability of flow of data and information, availability of information technology and monitoring systems, and the effectiveness of communication between actors.	Emissions data not being collected; lack of reporting to policymakers after the implementation of policies; lack of MRV systems.
Policy design	The initial phase of the policy process which includes identification of actors, instruments, setting of targets, allocation of responsibilities, and establishment of implementation frameworks.	Exclusion of relevant actors; ambiguous targets; unclear division of responsibilities among implementing agencies.
Legal mechanisms	Legal mechanisms available to address issues related to policy non-compliance, enforcement, or disputes.	Insufficient legal tools or mechanisms to enforce policy decisions or when the existing laws are not equipped to address compliance issues.
Human talent	Skilled personnel and institutional leadership to drive innovation and implementation.	Limitations in knowledge, skills, innovation or entrepreneurship in the general population.

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