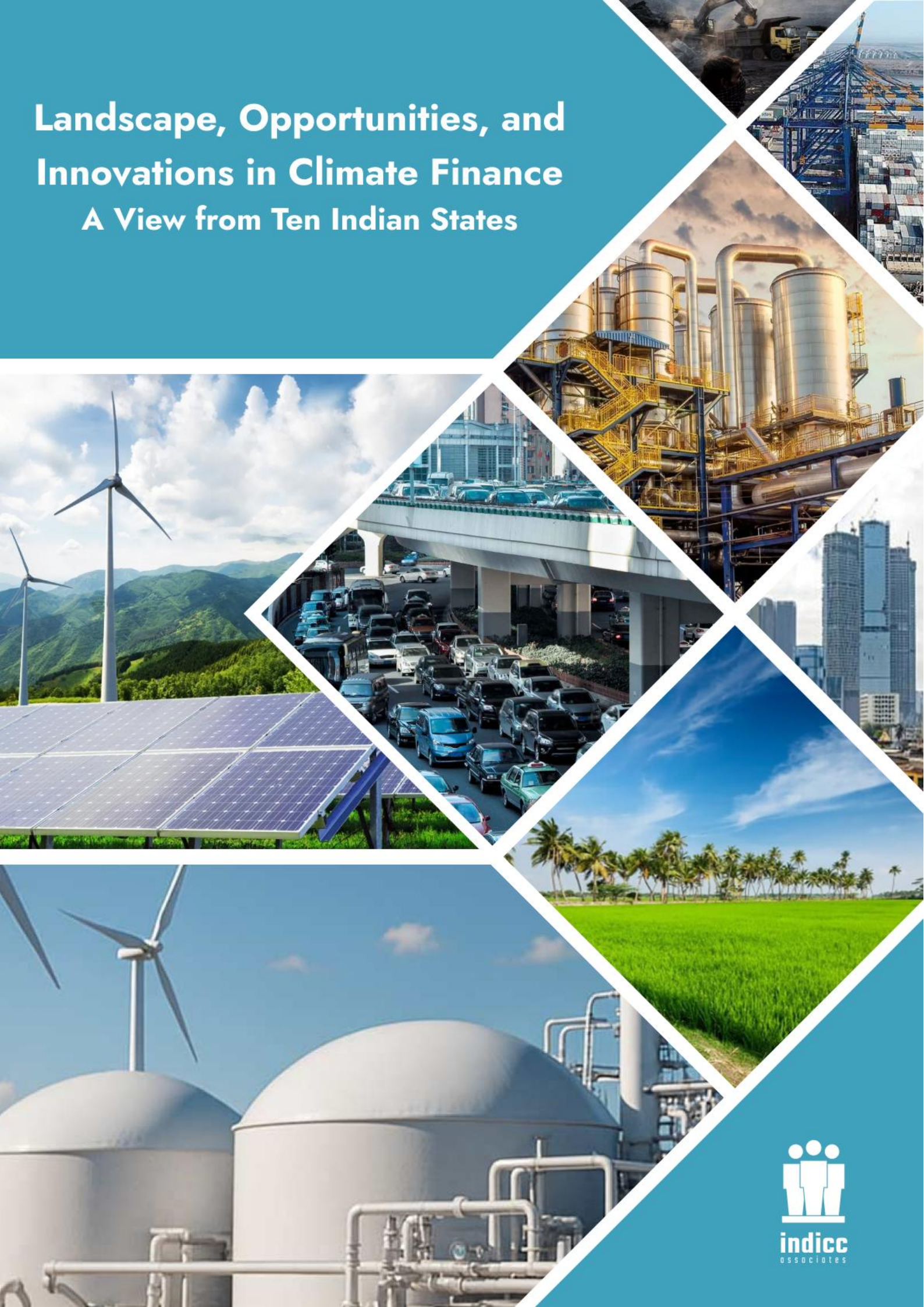
Landscape, Opportunities, and Innovations in Climate Finance

A View from Ten Indian States



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Authors:

Abhishek Kumar; Prabhanjan Singh; Himanshu Trivedi; Dhwaj Khattar; Suranjali Tandon

Design:

Krishn Mathur, Neha Thadani

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About the Report

This report is about climate finance[1] mobilization at the subnational level in India. In this regard, it aims to capture the landscape, barriers and opportunities across ten states namely – Andhra Pradesh, Assam, Bihar, Gujarat, Maharashtra, Odisha, Rajasthan, Tamil Nadu, and Uttar Pradesh. As this report lists down these elements in various chapters, an important question emerges simultaneously i.e. the capital by its very nature should be fluid and therefore its seamless flow requires both - dredging and gradient. In this report 'dredging' is represented by set of policy initiatives, targets, incentives and support mechanisms coming from the centre and states for market creation and financial innovation at the sub-national level, and the 'gradient' is represented by instruments, structures and propositions that would help the flow and recycling of finance from one stage of the project to the other and from one sector to the other without fiscal overhang in states.

Towards this endeavour the report highlights replicable initiatives, instruments, and structures; entails a commentary on sectoral targets and incentives; highlights readiness of public sector undertakings and municipalities for mobilisation of climate finance; provides insights into the flow of concessional finance and Development Finance Institutions (DFIs); discusses the need for transition plans at the subnational level and circularity in finance for continuous climate while managing debt. The report also highlights initiatives and incentives for subnational climate action driven from the centre.

The gap in the climate finance requirements implicitly suggests that climate capital is not moving at a pace and scale needed, despite numerous Indian states showing momentum towards green growth amid increasing climate vulnerability. Therefore, we need to do both - streamline the dredging process and reconceptualize financing to allow necessary gradient for finance to flow. This report aims to capture these details and ends with key and actionable recommendations.

The report can be a useful resource for state governments to learn from each other; for investors to understand state level opportunities; for policy makers to focus on necessary policy and practice reforms; for ministries to obtain a consolidated view of climate action; and for financial institutions to have an overview of finance flows and debt managers to focus on circularity in finance.

1 Climate finance broadly refers to resources, from public and private sources, mobilized to facilitate, materialize, or expand activities that support climate change mitigation actions and adaptation efforts. According to the United Nations Framework Convention on Climate Change (UNFCCC), "climate finance refers to local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change."

Acknowledgement

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Finally, any error or omission is solely ours and should not be ascribed to any of the above acknowledged experts or institutions.

Executive Summary

As per the NITI Aayog, even as India has made considerable progress in reducing emission intensity by 36 percent over 2005 levels and achieving 50 percent non-fossil power capacity five years ahead of its Nationally Determined Contribution target, the country needs USD 22.7 trillion over next 35 years and USD 8 trillion between 2026 to 2050 to achieve its climate goals.[2]

With annual investment flow from domestic sources in tackling climate change at a mere USD 135 billion (USD 80-90 billion towards clean energy projects), the task is enormous and one that requires urgent, massive and long-term outlook.

Much of India's climate action will unfold at the level of states which face severe climate vulnerability often translating into severe losses in infrastructure and livelihood. Therefore, resource mobilisation at the state level remains a central issue particularly in light of the fact that there is limited fiscal headroom.

Interestingly many states in India have articulated ambitious growth trajectories which in parallel is accompanied by green growth across sectors. This momentum can be gleaned from state level sectoral policies and corresponding support from the centre. However, it must be stated that efforts made by Indian states on green growth may already be beyond what policy targets envisage.

With respect to mobilisation of finance for climate action, granular specificity is required to assess the quantum of finance. This must be accompanied by states' capacity to stack up projects across sectors at different stages of risk. This needs to be complemented by a set of financial instruments and structures that will enable the flow of finance without adding to the fiscal burden.

With the help of insights from ten Indian states[3] and a commentary on innovative financial instruments/structures, this report aims to throw light on the opportunities and barriers to mobilise climate finance[4] at scale. Towards this endeavour, the report is divided into eight chapters.

Chapter I establishes the climate and fiscal challenge that underline the ten states. The climate challenge establishes the need for urgent action while the fiscal challenge highlights the public finance limitation to tackle the same.

Chapter II deals with processes, provisions, instruments and structures that can be deployed by states for climate finance mobilisation and recycling of finance. Some of these instruments/structures are not particularly designed for climate action but can be immensely useful to address the scale of finance required to meet the desired climate

2 Note: This report was completed before India's revised NDCs were announced
3 Ten states considered in the report include Tamil Nadu, Gujarat, Assam, Uttar Pradesh, Rajasthan, Maharashtra, Andhra Pradesh, Odisha, Jharkhand and Bihar
4 Note: The report uses the term climate finance due to its broader coverage (the term Green Finance is a sub-set of Climate Finance)

action. The chapter also makes a case for deepening green bond market at the state level by replicating sovereign green bond framework. In that pursuit, it argues that long term capital has regulatory mandates which enable substantive investment in government securities and therefore green sustainable development loans by states must be promoted for climate aligned infrastructure. This would help to deepen the green bond market at the state level.

It then emphasises the use of green and resilience taxonomies as a tool to avoid green washing and elicit investor interest. In doing so, it argues that till such time India's own climate taxonomy is in place, international taxonomies which are underpinned by science can be adjusted for India's net zero targets, particularly since interoperability is an underlying feature of India's Draft Taxonomy Framework.

The chapter also deals with Partial Credit Enhancement features available with banks and DFIs like The National Bank for Financing Infrastructure and Development (NaBFID). These features are useful but not sufficient as they cater to entities that are already investment grade. The chapter finally discusses Value Capture Finance (VCF) as a tool to unlock fresh sources of finance and ends with a discussion on Infrastructure Investment Trusts (InvITs) and Infrastructure Debt Funds (IDF) as instruments that can substantively recycle finance without additional debt.

Chapter III provides a sectoral overview in ten states of opportunities in five areas namely energy, electric mobility, urban infrastructure, agriculture and sustainable industrialisation. It also discusses initiatives from the central government that pad up state level action. This chapter reads more like a status on sectoral targets, but its main purpose is to highlight the opportunities embedded within policy targets and pronouncements.

Chapter IV deals with the readiness of state Public Sector Enterprises (PSEs) and municipalities and entails a description (visualisation) on incentives that state level sectoral policies enunciate. The purpose of this chapter is to highlight that while incentives across policies to attract the private sector investment in green activities look encouraging, the state PSEs and municipalities themselves are largely not equipped by to mobilise quantum of substantive financing due to their limited market orientation. It must be stated that the chapter or the report does not deal with quality and efficacy of incentives.

Chapter V provides a snapshot of flow of concessional finance and Assets Under Management (AUM) of key Development Finance Institutions (DFI). It brings out two interesting insights. First, that concessional finance typically gravitates more in certain areas than others and a similar skewness can be observed with regards to assets under management of DFIs. Therefore, this must necessitate a discussion on financing for underserved sectors/areas.

Chapter VI deals with transition planning and argues that transition planning in states should ideally be at four levels, namely the state level, departmental level, PSE and municipal level. One way to do that is to reverse engineer policy targets to arrive at each state's contribution to India's NDCs through respective policy measures. While desirable, this proposition has limitations since policy targets across sectors are not always specific across defined time frame making it difficult to quantify corresponding climate finance requirement. Further as highlighted above, efforts by states may also be beyond the policy pronouncements. These limitations prevent a coherent transition strategy at the state level. This chapter also provides a constructive critique on green budgets of three states and highlights that while these states have been formulating green budgets, the same do little to leverage investor interest or align with green priorities of respective states. Notwithstanding these limitations, the chapter highlights that contours of systematic transition planning are visible in few states, nevertheless.

Chapter VII discusses at length the issues that inhibit free and derisked flow of finance. This section lays emphasis on how a combination of Joint Ventures (JV), Public Private Partnerships (PPP), Infrastructure Investment Trusts (InvITs) and Infrastructure Debt Funds (IDF) can create a virtuous circularity/recycling of finance without fiscal overhang, thereby addressing the very need to mobilise climate finance under public debt constraints. In doing do, it highlights some of the fundamental changes that need to be introduced for capital to flow seamlessly from one state to the other and from one sector to the other.

Chapter VIII deals with key recommendations considering the key findings discussed in this report.

List of Abbreviations

AUM	Assets Under Management
BIS	Bank of International Settlements
BRSR	Business Responsibility and Sustainability Reporting
CCTS	Carbon Credit Trading Scheme
CICERO	Centre for International Climate and Environmental Research
CII	Confederation on Indian Industry
DFI	Development Finance Institutions
DPIIT	Department for Promotion of Industry and Internal Trade
GEC	Green Economy Coalition
ICMA	International Capital Market Association
IDF	Infrastructure Debt Funds
IEEFA	Institute for Energy Economics and Financial Analysis
InvITs	Infrastructure Investment Trusts
JV	Joint Venture
LMT	Lakh Metric Tonnes
LT-LEDS	Long Term Low Emission Development Strategies
MSMEs	Medium, Small and Micro Enterprises
NaBFID	National Bank for Financing Infrastructure and Development
NF	Natural Farming
NGRBC	National Guidelines on Responsible Business Conduct
PCE	Personal Consumption Expenditures
PM	Prime Minister
PM e-bus	Pradhan Mantri e-Bus Sewa scheme
PM e-drive	Pradhan Mantri e-drive
PPP	Public Private Partnership
PSE	Public Sector Enterprises
RE	Renewable Energy
RIPS	Rajasthan Investment Promotion Scheme
SEBI	Securities and Exchange Board of India
SIDBI	Small Industries Development Bank of India
SPO	Second Party Opinion
SPV	Special Purpose Vehicle
VCF	Venture Capital Fund

State's Abbreviations

AP	Andhra Pradesh
AS	Assam
BR	Bihar
GJ	Gujarat

JH	Jharkhand
MH	Maharashtra
OD	Odisha
RJ	Rajasthan
TN	Tamil Nadu
UP	Uttar Pradesh

CHAPTER I

OVERVIEW

1. Background

Emerging markets face an overwhelming challenge of mobilising trillions of dollars for climate aligned infrastructure while operating under record high public debt. As per UNCTAD, the annual cost to fight climate change, protect biodiversity and cut pollution in developing countries is projected to cost nearly $5.5 trillion annually from 2023 to 2030 at a time when public debt in developing countries is record high (accounting for $31 trillion) growing twice as fast as in developed economies since 2010[5].

To meet these costs, both domestic and external financial sources would need to be mobilised. However, at the same time developing countries face a high and growing cost of external public debt which is two to four times higher than those for developed countries[6]. The November 2025 report of the Independent High-Level Expert Group on Climate Finance estimates that emerging markets and developing economies excluding China require USD 3.2 trillion per year by 2035 in climate and development-related investment, of which USD 1.9 trillion (approximately 59 per cent) must be raised from domestic sources and USD 1.3 trillion from external sources.[7] For India specifically, the Ministry of Finance's Draft Climate Finance Taxonomy Framework (May 2025) estimates an annual requirement of around USD 250 billion.[8] The policy implication is that domestic sources - budgetary allocations, DFI lending, institutional investors, capital markets, must carry the majority weight of the financing burden. External concessional flows remain critical for de-risking and first-loss tranches but cannot substitute for domestic mobilisation at the scale required.[9]

As for India, the country reports a general government debt which stands at about 80% of GDP. As per another UN estimate, climate change and its impacts in the last two decades have cost India USD 179.5 billion[10]. India faces escalating multi-hazard climate risks, including floods, droughts, heatwaves, cyclones, and erratic monsoon patterns which increasingly result in measurable economic losses, infrastructure damage, and livelihood disruption. The National Disaster Management Authority (NDMA) estimates that India incurred losses exceeding USD 30 billion in 2024 alone due to cyclones, floods, heatwaves, and droughts, with losses projected to grow by 10–15% annually if adaptive capacity does not improve[11].

Over the years, India and Indian states have developed several plans, policies, incentives, processes and financial innovations to counter climate change. These steps along with certain additionalities and by leveraging emerging technologies can greatly

5 https://unctad.org/sdg-costing/climate-change
6 https://unctad.org/news/debt-crisis-developing-countries-external-debt-hits-record-114-trillion
7 https://unctad.org/news/developing-countries-face-record-high-public-debt-burdens-now-time-reform
8 https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/may/doc202557551101.pdf
9 https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2025/11/IHLEG-on-Climate-Finance-4th-Report-Delivering-an-integrated-climate-finance-agenda.pdf
10 https://vajiramandravi.com/current-affairs/debt-gdp-ratio-india/
11 https://www.bbc.com/news/articles/c5yp8r4ryvmo

help in meeting the dual challenges of mobilising finance without fiscal overhang while addressing climate action.

Key Message: *A coherent strategy for climate action across different orders of the government is a must.*

2. Importance of Role of States in Climate Action

Under Article 4.19 of the Paris Agreement under the UNFCCC, parties agreed to formulate long-term low greenhouse gas emission development strategies taking into account their common but differentiated responsibilities and respective capabilities.

Accordingly, India articulated its Long Term-Low Emission Development Strategies (LT-LEDS) in 2022. LT-LEDS emphasise coordinated climate action across the economy i.e. across several sectors and Ministries, *as well as its 28 States and 8 Union Territories*, operating in a *predictable and federalized* structure of governance**.** They unequivocally aim to promote States as engines of climate action to improve their scientific and policymaking capabilities.

With respect to climate finance, LT-LEDS emphasise the criticality for India and other developing countries to formulate their roadmap for climate finance. This volume therefore endeavours to present a coherent picture of how India and select Indian states are moving in that direction and what needs to be done going forward.

Key Message: *India's LT LEDS establish criticality of climate finance roadmap while highlighting the criticality of sub-national action*

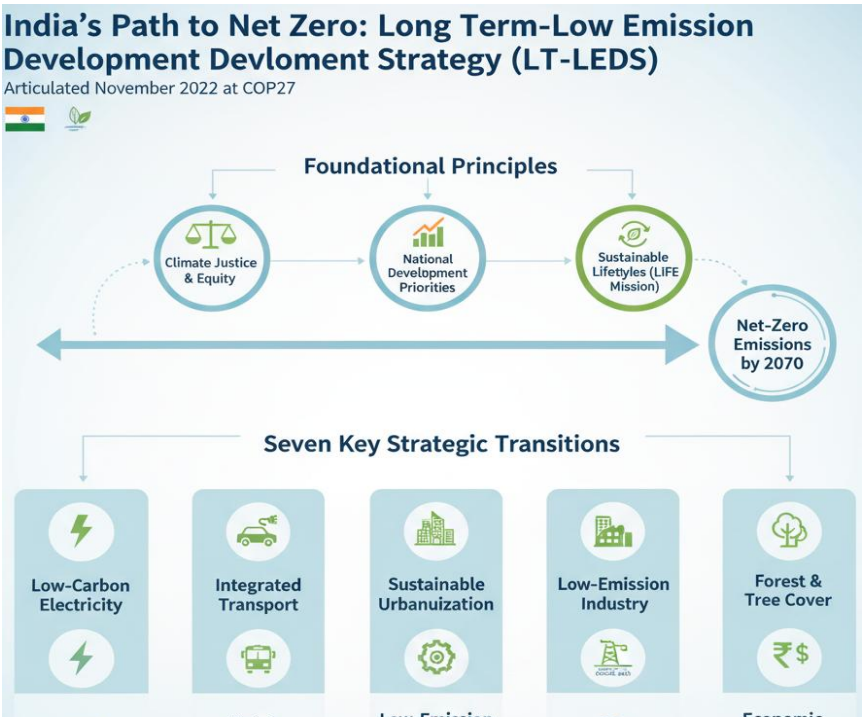

Figure 1: India's Long Term-Low Emission Development Strategies; Source: Government of India LT-LEDS Document 2022

Overview from Select States

Indian states are increasingly embedding climate ambitions within their development trajectories, articulating quantified growth aspirations and sectoral green action. An illustrative sample of ten states namely Andhra Pradesh, Assam, Bihar, Gujarat, Jharkhand, Maharashtra, Odisha, Rajasthan, Tamil Nadu and Uttar Pradesh, puts this in perspective.

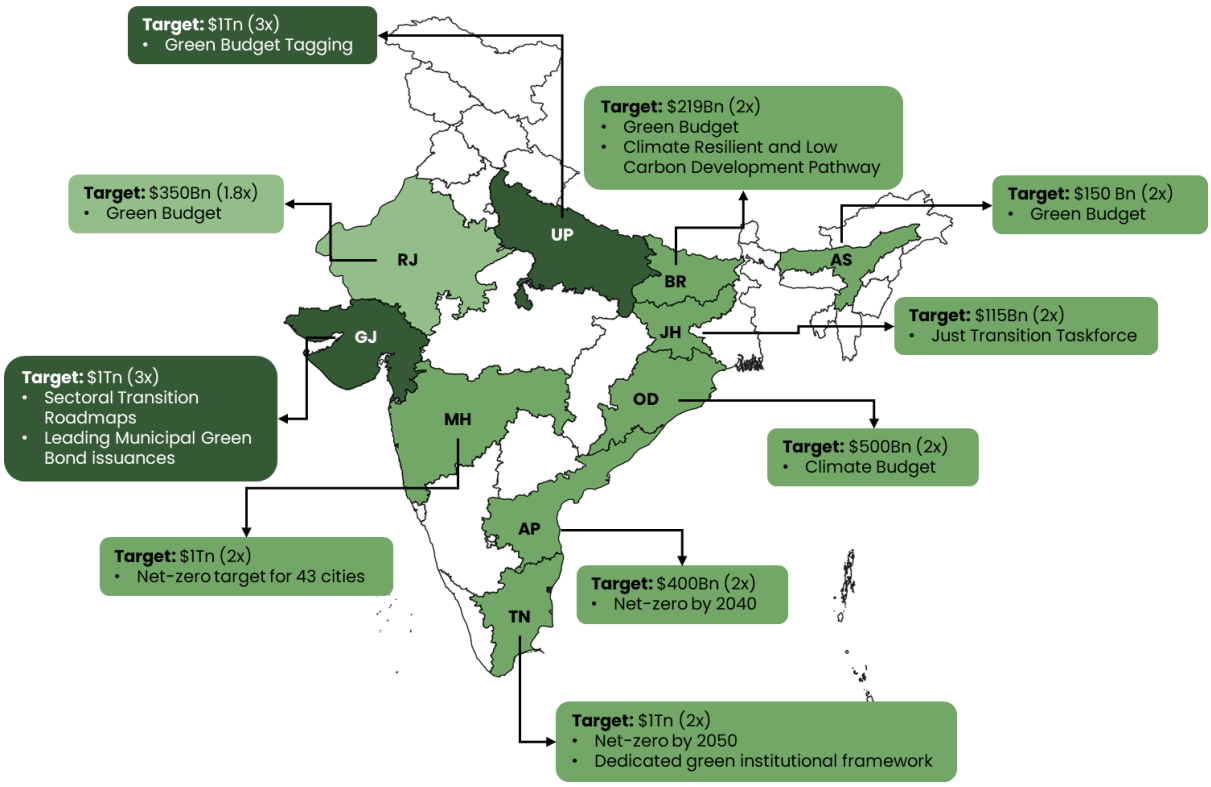

Figure 2: GSDP targets and key Green Growth initiatives of 10 selected states; Source: Indicc Analysis

Key Message: *A sample of 10 states show not just quantified growth targets but also increasing green growth momentum across states.*

When assessed on climate vulnerabilities, the imperative for climate action is amplified by the acute vulnerability of these states to climate hazards. The entire subcontinent is exposed to increasing climate volatility, but the nature of the risk varies geographically. Andhra Pradesh, Odisha, Tamil Nadu, and Gujarat face severe threats from cyclones and coastal erosion, endangering critical infrastructure, agriculture, and coastal industries. Assam and Bihar are highly susceptible to floods and riverbank erosion, which displace communities and disrupt key economic sectors like tea and rice production. Rajasthan is one of India's most water-stressed regions, facing severe scarcity and groundwater depletion. Large parts of Maharashtra, Andhra Pradesh, and southern Bihar are also chronically drought prone. Heatwaves are a significant hazard for most of the states, particularly Gujarat, Andhra Pradesh, and Rajasthan, impacting public health, labour

productivity, and energy demand and the hilly regions of Assam, Maharashtra and Bihar are prone to landslides, often exacerbated by heavy rainfall and deforestation.

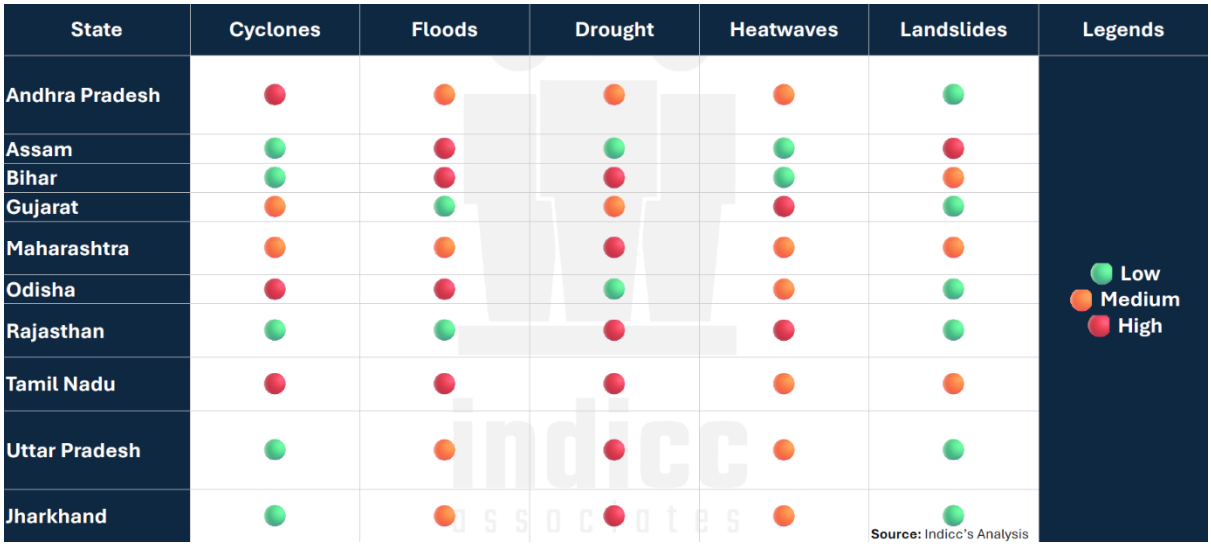

Figure 3: High level climate vulnerability assessment of 10 selected states; Source: Indicc Analysis

As climate change makes extreme weather events more frequent and severe, financial stability stands threatened. The Bank for International Settlements (BIS) has termed this type of risk as a "Green Swan" event, indicating that climate-change-related risks are complex, unpredictable, and potentially catastrophic. Moreover, in a recent international survey, climate change topped the list of long-term risks for banks.[12] Accordingly, the Reserve Bank of India (RBI) has also put out a Draft disclosure framework on climate-related financial risks in 2024. The framework mandates disclosures by regulated entities (REs) in key areas of governance[13].

Key Message: *The green growth momentum signals acknowledgement of rising climate vulnerability in Indian states. Climate risk assessment at asset level can provide a granular understanding of interventions required for increasing asset resilience.*

Notably, the economic growth and green growth commitments of Indian states are despite limited fiscal headroom. Six of the ten states considered in this report are past their respective debt ceilings as per their fiscal responsibility legislations. At an aggregate level, the ten states considered in this report show a limited fiscal headroom with respect to broad climate finance requirements estimated at the country level.

12 https://www.ceew.in/gfc/quick-reads/explains/climate-scenario-analysis-stress-testing
13 https://fidcindia.org.in/wp-content/uploads/2024/02/RBI-DRAFT-CLIMATE-RELATED-FINANCIAL-RISKS-28-02-24.pdf

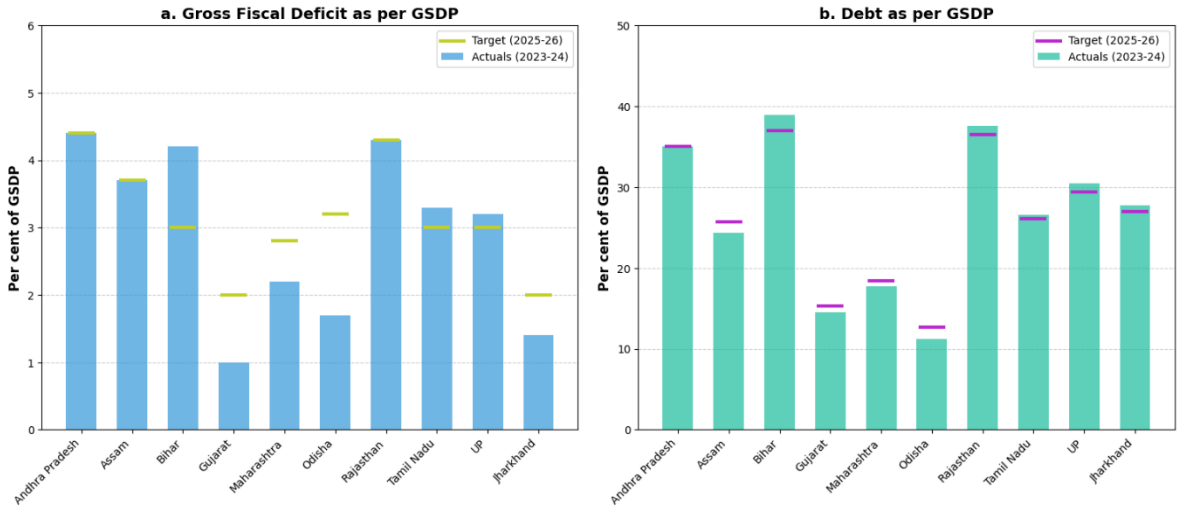

Figure 4: Fiscal headroom in 10 selected states; Source: Indicc Analysis

In the above context, a brief discussion on the recommendations of the XVI Finance Commission is also in order. The XVI Finance Commission has retained states' share in the divisible pool at 41 per cent, while revising the horizontal devolution formula through changes in the weights assigned to income distance, population, demographic performance and area, and by introducing a 10 per cent weight for contribution to GDP by states.

Importantly from the climate finance perspective, it has retained a 10 per cent weight for forest, while broadening the criterion to include open forests and increase in weighted forest area between 2015 and 2023. It has also recommended that grants-in-aid for the award period be confined to local bodies and disaster management, while discontinuing revenue deficit, sector-specific and state-specific grants.

The implications of these recommendations for states are mixed. The XVI Finance Commission modestly strengthens the enabling framework for climate-relevant public finance through three channels: first, a forest-sensitive devolution formula; second, tied local body grants, with 50 per cent of the basic grant linked to sanitation, solid waste management and/or water management, alongside a Special Infrastructure Component of ₹56,100 crore for wastewater management and an urbanisation premium of ₹10,000 crore; and third, a strengthened disaster management framework, with a corpus of ₹2,04,401 crore for SDRF and SDMF together. In effect, while the XVI Finance Commission improves the climate finance enabling environment in some respects, it does not materially alter the broader fiscal constraint facing states as there is no dedicated grant in the context of climate action.

Particularly, with respect to the ten states covered in this report, the potential impact of XVI Finance Commission recommendation differs from state to state. While some states may gain from the revised devolution formula, others see a relative decline compared to the recommendations of the previous finance commission.

Table 1: Potential Impact of 16th Finance Commission on States

State	Change in devolution share under XVI FC	Overall potential impact of XVI FC on the state	Potential impact on climate finance
Andhra Pradesh	4.05% to 4.22%	Slight improvement in overall transfers, with continued access to local body and disaster grants	Climate-relevant support improves through local body grants, disaster grants and wastewater-linked urban investment in Vishakhapatnam and Vijayawada
Assam	3.13% to 3.26%	Improvement in devolution share and continued support through formula-based transfers	Main relevance is through disaster management and adaptation-linked spending; the 90:10 cost-sharing pattern is also favourable
Bihar	10.06% to 9.95%	Relative decline in devolution share, though Bihar remains a very large recipient in absolute terms	Climate-relevant fiscal space remains significant through local body grants, disaster grants and the wastewater component for Patna
Gujarat	3.48% to 3.76%	Improvement in devolution share, with gains also from the revised formula including contribution to GDP	Positive for climate finance through local body grants, disaster grants and wastewater-linked investment in Vadodara and Rajkot
Jharkhand	3.31% to 3.36%	Marginal improvement in devolution share	Forest criterion is directionally useful; local body grants, disaster grants and wastewater-linked investment in Dhanbad and Ranchi add to climate-relevant space
Maharashtra	6.32% to 6.44%	Improvement in devolution share and large absolute transfer envelope	Strong climate relevance through large local body grants, disaster grants and wastewater-linked investment in Pune and Nagpur
Odisha	4.53% to 4.42%	Relative decline in devolution share	Climate support continues mainly through disaster management and local body grants rather than through a stronger devolution outcome
Rajasthan	6.03% to 5.93%	Relative decline in devolution share, though grants remain substantial in absolute terms	Climate relevance remains through local body grants, disaster grants and wastewater-linked investment in Jaipur and Jodhpur
Tamil Nadu	4.08% to 4.10%	Broadly stable position with a marginal improvement in share	Climate-relevant support comes mainly through urban grants, disaster grants and wastewater-linked investment in Coimbatore and Madurai
Uttar Pradesh	17.94% to 17.62%	Relative decline in devolution share, though it remains the largest state in absolute terms	Climate-relevant fiscal space remains very large through local body grants, disaster grants and wastewater-linked investment in Lucknow and Kanpur

Source: state shares, eligible cities and state-wise grants-in-aid from the XVI Finance Commission summary and Annexures

Key Message: *Innovative financial mechanisms are needed to crowd in private capital without fiscal overhang.*

CHAPTER II

REPLICABLE INITIATIVES AND INNOVATIONS FOR EXPANDING ENVELOPE FOR CLIMATE FINANCE

As India is a federal country, green transition in states is influenced by policies and initiatives at all levels of governments. Therefore, it is pertinent to highlight key policies/initiatives driven from the Union Level, State Level and the Local level while also highlighting intergovernmental compact and replicability wherever possible.

1. Sovereign Green Bond (SGrB) Framework sets a replicable template sub-national action[14]

One of the first things which serves as a replicable model for states is the Sovereign Green Bond (SGrB) Framework, published in November 2022 by the Department of Economic Affairs, Ministry of Finance, Government of India. It outlines the principles guiding the issuance and utilization of proceeds from the SGrB. This framework adheres to the Green Bond Principles (2021) formulated by the International Capital Market Association (ICMA), which recommends delineation of clear process and disclosures, and has also been reviewed by Centre for International Climate Research (CICERO) which has issued an independent Second Party Opinion (SPO).

In alignment with the ICMA Green Bond Principles, a Green Finance Working Committee (GFWC) was constituted with representatives from the relevant line ministries to select and evaluate eligible projects to be financed using proceeds from SGrBs.

In 2022-23, the Government of India (GoI) for the first time issued Sovereign Green Bonds (SGrB) to raise approx. USD 1.82 billion. In total, GoI issued SGrBs for raising approx. USD 6.6 billion between FY 2022-23 and FY 2024-25 of which clean transportation and renewable energy accounted for more than 83% of the total proceeds raised.

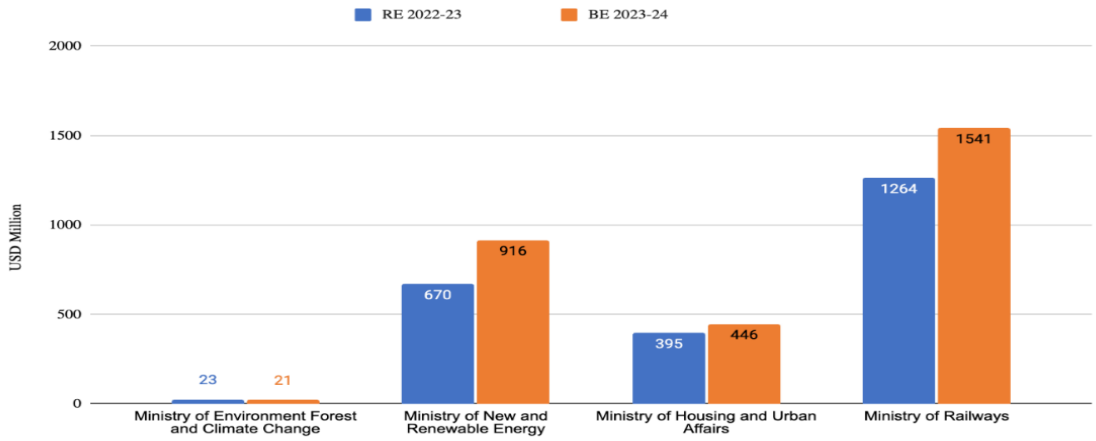

Figure 5: Sovereign Green Bonds - Use of Proceeds; Source: Indicc Analysis

14 https://dea.gov.in/files/policy_and_guidelines_document/FrameworkSovereignGreenBonds.pdf

From the process point of view, at the state level a similar effort was demonstrated by the state of Maharashtra.

> In 2022, Maharashtra became the first state to establish Green Finance Working Committee (MGFWC), with the aim of generating INR 50 billion through green bonds. Led by the state finance secretary it comprised representatives from various departments such as planning, energy, environment and climate change, revenue, and forests. The state sought to raise funds through the SDL process for projects related to renewable energy, green buildings, green hydrogen, electric mobility, and charging infrastructure.
>
> Sources: Times of India

The Maharashtra example is an interesting one for two reasons. First, it entails a demonstration effect for other states and second, such steps can engender an internal administrative capacity which can lead to much bigger ticket size over a period.

Notably, in India the insurance and pension sectors have the largest share of investor capital among long term domestic institutional investors. They are also among the largest investors in the Indian debt and equity markets. According to Insurance Regulatory and Development Authority of India (IRDAI) regulations, life insurers operating in the country must invest at least 40–50% of investment assets (varies between life insurer categories) in central and state government securities, such as bonds and debentures. Similarly, the Pension Fund Regulatory and Development Authority (PFRDA) investment regulations that govern the investment pattern for assets managed by pension scheme providers in India also mandate about 45–50% investments in government securities[15].

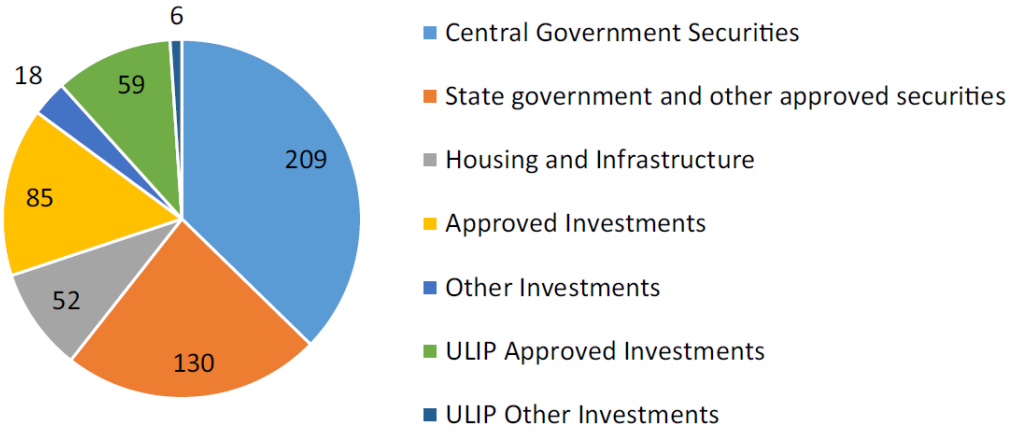

Figure 6: Investment pattern of life insurers as of March 2021 (US$ billion); Source: IRDAI

15 **Role of Domestic Institutional Capital in Funding India's Energy Transition** *Shantanu Srivastava*

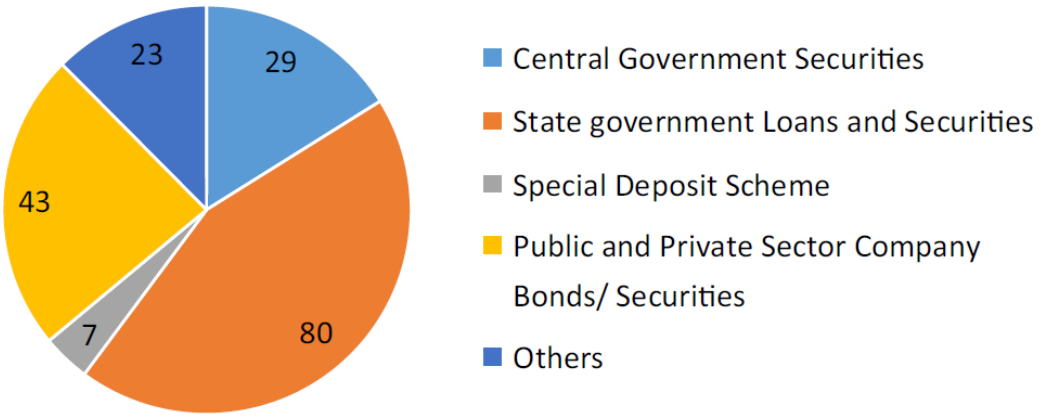

Figure 7: Combined Debt Investments of Schemes Under EPFO[16] as of March 2021 (US$ billion); Source: PFRDA

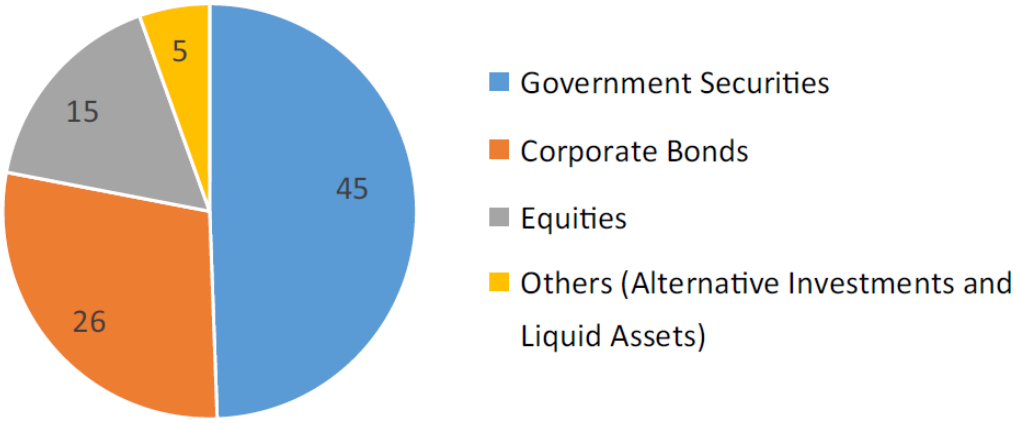

Figure 8: Investment pattern of NPS[17] as of March 2022 (US$ billion); Source: NPS Trust

Their investment priorities suggest that for the long-term private capital, significant investment in government securities is a preferred option. In this backdrop, state governments could potentially earmark a part of Sustainable Development Loan (SDL) issuances specifically for green projects. International experience shows that greenium[18] tends to be durable when sovereign green bonds are issued in large, liquid benchmark sizes, allow clear comparability with conventional bonds, provide credible and timely allocation, timely impact reporting, and are embedded within a stable sovereign debt programme[19].

Key Message: *Green SDLs can broaden labelled green bond market substantially while bringing the cost of capital down and positively reflecting on quality of expenditure by state governments.*

16 EPFO stands for Employees' Provident Fund Organization, a statutory body established to manage provident fund, pension, and insurance schemes for workers in the organised sector
17 National Pension System (NPS) is a voluntary, defined-contribution retirement savings scheme under which subscribers contribute to individual pension accounts invested across different classes
18 Greenium refers to the price advantage (premium) enjoyed by Green Bonds over similar vanilla issuances
19 Economic Survey 2025-26

2. Draft Framework of India's Climate Finance Taxonomy

Close on the heels of Sovereign Green Bond Framework, the Government of India in the Union Budget 2024-25 made an announcement for formulating India's Climate Finance Taxonomy. Subsequently, in 2025 the Department of Economic Affairs, Ministry of Finance released the draft framework of India's Climate Finance Taxonomy.[20]

The objective of the taxonomy is to enhance clarity & transparency for the investors through a scientific framework with qualitative and quantitative aspects for sectors, facilitate the identification of investment opportunities in climate-aligned activities for enabling the flow of finance from financial institutions, while also mitigating the risk of 'greenwashing' - a persistent concern in the mobilisation of climate finance.

Among the notable features of the draft framework is the incorporation of the principle of Do No Significant Harm (DNSH), which seeks to ensure that while an activity may contribute to one climate objective, it should not significantly undermine other environmental or climate goals. This is particularly important for preserving the credibility and integrity of climate finance flows while also addressing the risk of greenwashing and unintended consequences. The framework also recognises the need to support transition activities, acknowledging that in a developing economy such as India, climate finance must not be limited only to activities that are already fully green but should also facilitate the gradual transition of emissions-intensive sectors and assets towards alignment with longer-term climate objectives.

India's Draft Climate Finance Taxonomy framework underscores that the taxonomy must continually evolve in scope and depth to reflect the dynamic and unique nature of India's economy, demonstrating the attributes of a 'living document'. Amongst other aspects, it acknowledges that interoperability with global taxonomies is critical for enhancing investor confidence. In view of interoperability as a key feature, international standards are fit for purpose and can be adopted by states till such time India's own taxonomy is in place, provided they are adjusted to India's 2070 targets and embedded in science for both mitigation as well as adaptation.

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20 India's Draft Framework for Climate Finance Taxonomy

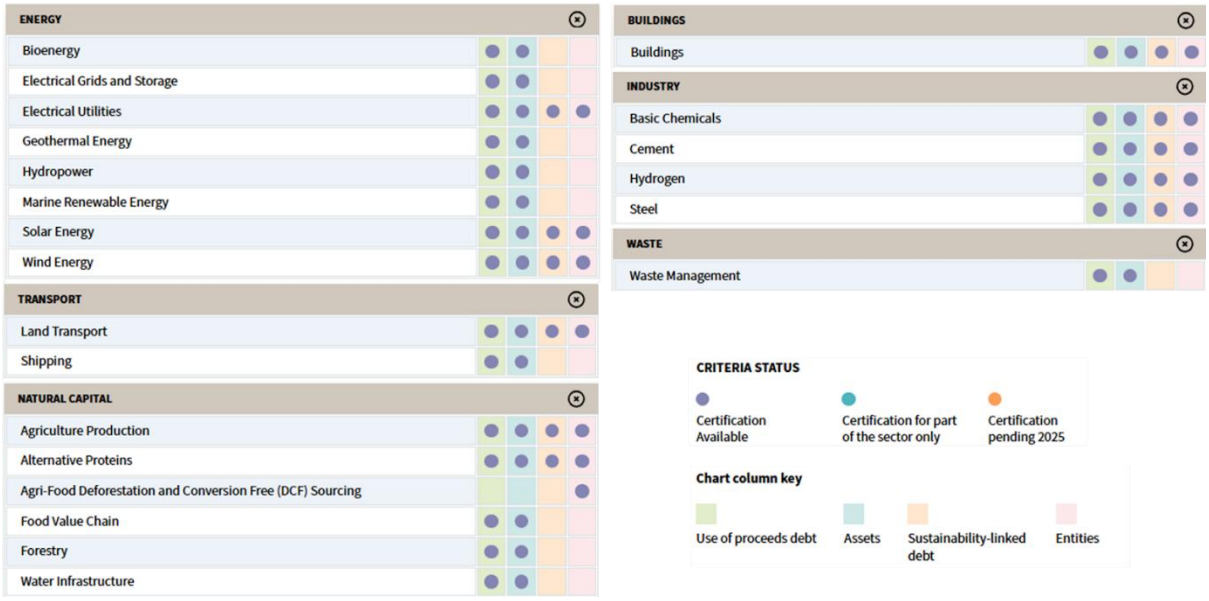


Figure 9: Overview of Taxonomy by Climate Bonds Initiative

Figure 9 summarises the sectoral architecture of the Climate Bonds Initiative's taxonomy, against which Indian green debt issuances may be benchmarked. The Climate Bonds Taxonomy organises eligible investments by sector (energy, transport, water, buildings, land use, industry, waste, ICT) and establishes Sector Criteria that define climate benchmarks for specific activities. Under the Climate Bonds Standard, a debt instrument or entity is certified if an independent verifier confirms alignment with the standard and applicable sector criteria. In the figure, 'criteria status' refers to whether sector criteria have been published for each sector (some are still under development by Climate Bonds Technical Working Groups).

As materialisation of climate risks has become an important area to consider, resilience across sectors and in infrastructure has emerged as an important area of focus. In this regards applicability of 'Resilience Taxonomy' has also assumed special significance. Accordingly, Climate Bonds Initiative has also published a 'Resilience Taxonomy' defining resilience across areas such as infrastructure; social systems; Agri-food systems; Cities and Settlements; Health; Industry & Commerce and Natural Systems.

The utility of resilience taxonomy will play out in issuances of resilience bond. Resilience bonds seek to raise capital specifically for climate resilient investment. These investments improve the ability of assets and systems to persist, adapt and/or transform in a timely, efficient, and fair manner that reduces climate risk, avoids maladaptation, and unlocks broader development benefits. It is pertinent to highlight that resilience in infrastructure systems is rapidly gaining traction for future proofing the investments. For instance, United Nations Economic Commission for Europe (UNECE) has also recently published guidelines[21] on how PPPs can contribute to climate adaptation and resilience,

21https://unece.org/sites/default/files/2026-04/UNECE%20Draft%20Guidelines%20on%20promoting%20climate%20resilient%20PPPs%20and%20infrastructure%20projects%20in%20support%20of%20the%20SDGs.pdf

aligning with the United Nations Sustainable Development Goals. Through policy recommendations and best practices, it aims to assist public authorities in integrating these critical aspects into the planning, development, and implementation of infrastructure projects.

Figure 10: Features of Resilience Taxonomy of Climate Bonds Initiative

Key Message: *Internationally recognised climate taxonomies are fit for purpose until India has its own taxonomy. The use of climate and resilience taxonomies must be mandated to avoid green washing, future proofing investments and elicit investor interest*

3. Partial Credit Enhancement (PCE) facility

Partial Credit Enhancement (PCE) is a financial mechanism designed to reduce risk, where a third party offers limited financial support to enhance the credit rating of a debt instrument. PCE is structured as a non-funded, irrevocable contingent line of credit and the facility can be drawn upon in the event of cash flow shortfalls affecting bond servicing.

PCE can be provided to bonds with a pre-enhanced rating of BBB- or higher. However, stringent capital requirements and restrictions (e.g., limits on the proportion of PCE support a single bank can provide) have constrained the scope and commercial viability of PCE. The bank providing PCE does not hold capital based only on its PCE amount. Instead, it calculates the capital based on the difference between the capital required before credit enhancement and the capital required after credit enhancement (as per the applicable risk weights)[22].

22 https://icmai.in/upload/pd/Partial-Credit-28092015.pdf

This requires the PCE provider to maintain huge regulatory capital for a significantly long period of time which also gets reflected in the ultimate cost to the beneficiary. The aggregate PCE provided by all banks for a given bond issue was revised to 50% of the bond issue size in 2016 (initially set at 20%), with a limit of up to 20% of the bond issue size for an individual bank. This enhancement is expected to facilitate companies' access to bond markets at more competitive rates, particularly benefiting infrastructure projects. The RBI has also proposed a substantial reduction in the capital that regulated entities need to set aside when providing PCE.

This change aims to make PCE-backed instruments more attractive, and viable compared to traditional bank loans. Furthermore, issuers are now permitted to use the funds raised through PCE-backed bonds to repay existing bank loans, providing companies with greater flexibility in managing their debt and potentially freeing up bank limits for new projects.[23]

Additionally, the Partial Credit Enhancement (PCE) facility under the National Bank for Financing Infrastructure and Development (NaBFID)[24] also presents an opportunity to mobilise private capital for infrastructure projects which fall within investment grade (BBB-). The credit enhancement can result in a rating uplift from accredited agencies, making the instrument more investible for institutional investors such as insurance companies, pension funds and provident funds. The improved rating can not only broaden the investor base but also lowers the cost of borrowing, critical for long-term infrastructure projects, improving its financial viability and long-term sustainability. By mitigating credit risk and improving the creditworthiness of debt instruments, PCE can enable state and municipal entities to access capital markets more effectively.

***Key Message**: A PCE facility can enhance investment in infrastructure projects for lower rated state entities. However, only investment grade entities are eligible for PCE to enhance their ratings.*

4. Value Capture Finance

Value Capture Finance (VCF) has emerged in India as a response to the growing mismatch between infrastructure investment needs and limited fiscal capacity. Large public investments in metro rail, highways, urban redevelopment and transit-oriented development generate significant increases in surrounding land and property values. Traditionally, these value gains accrue privately to landowners and developers, while the cost of infrastructure is borne by the state. Value capture seeks to partially rebalance this asymmetry by enabling public authorities to recover a portion of the land value uplift created by public action and reinvest it into infrastructure financing.

23 file:///C:/Users/VeronicaMiranda/Downloads/Deepening_the_Corporate_Bond_Market_in_India.pdf
24 https://www.thehindubusinessline.com/money-and-banking/nabfid-launches-partial-credit-enhancement-facility/article70066231.ece

At the national level, the policy foundation for value capture was laid with the issuance of the *Value Capture Finance Policy Framework* by the Ministry of Housing and Urban Affairs in 2017[25]. The framework formally recognised land value uplift as a legitimate source of infrastructure finance and categorised value capture instruments into area-based and project-based mechanisms. This was reinforced by the National Transit Oriented Development Policy[26] and the Metro Rail Policy[27], both of which explicitly recommended the use of land value capture to support urban transport investments. Together, these policies signalled a shift in infrastructure financing logic from reliance on direct budgetary support toward leveraging the economic value generated by infrastructure itself.

In practice, value capture functions through the monetisation of development potential rather than through direct taxation alone. Governments capture part of this increase by charging premiums for additional floor area, levying betterment charges, monetising public land, or restructuring land ownership through pooling and readjustment mechanisms. The underlying financial logic remains consistent, public investment creates value, that value is partially captured through regulatory or market instruments, and the proceeds are recycled back into infrastructure funding, debt servicing or urban improvement.

One of the most visible forms of value capture in India has been land and property development by public agencies, particularly metro rail corporations. Another widely used mechanism is the charging of premium Floor Area Ratio (FAR) or Floor Space Index (FSI). Betterment levies and impact fees represent another theoretical pillar of value capture, whereby landowners benefiting from infrastructure investment are charged based on the incremental increase in land value.

Transferable Development Rights (TDRs) have been used in several cities as a non-cash value capture mechanism. Instead of paying monetary compensation when land is acquired or development is restricted, authorities issue development rights that can be sold or utilised elsewhere. This allows infrastructure creation without immediate fiscal outgo, while still compensating landowners through market mechanisms. Mumbai represents the most advanced example of sustained TDR usage.

A notable evolution in recent policy thinking has been the shift toward integrated, corridor-based value capture models, particularly through Transit-Oriented

Rajasthan's Transit-Oriented Development Policy of 2025 reflects this approach, establishing structured revenue-sharing mechanisms and earmarking captured value for local infrastructure improvements within TOD areas.

25 https://mohua.gov.in/upload/whatsnew/59c0bb2d8f11bVCF_Policy_Book_FINAL.pdf
26 https://mohua.gov.in/upload/whatsnew/59c0bb2d8f11bVCF_Policy_Book_FINAL.pdf
27 https://www.impriindia.com/insights/metro-rail-policy-2017-urban-mobility/

Development. Rather than relying on a single instrument, TOD frameworks bundle multiple value capture tools within clearly defined influence zones[28].

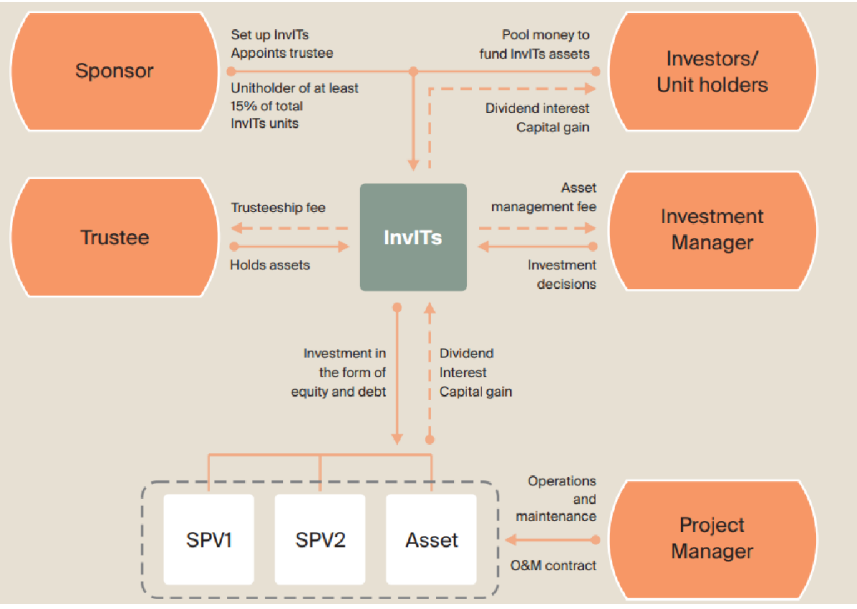
Overall, value capture finance in India is transitioning from isolated, project-specific experiments toward more structured spatial and institutional frameworks. While revenues generated so far remain insufficient to fully finance large infrastructure projects, VCF is increasingly viewed as a critical supplement that improves project viability, enhances PPP bankability, and reduces long-term fiscal pressure on states. The emerging focus is not merely on raising funds, but on creating circular financing systems where public investment generates value, captured value finances infrastructure, and improved infrastructure further reinforces economic productivity.

The apex policy think tank of Government of India, NITI Aayog, is anchoring efforts to promote faster adoption of land value capture mechanisms through creation of a knowledge bank on VCF with Indian and international experiences that can be utilised by the Centre, States and local governments.[29]

***Key Message**: Value Capture Finance can unlock additional finance for Climate Action at subnational level and must be promoted across all sectors.*

5. Infrastructure Investment Trusts (InvITs)

Perhaps the most eminent instrument which can efficiently aid in meeting the enormous financial needs of the green transition is Infrastructure Investment Trusts (InvITs). Regulated by capital market regulator Securities and Exchange Board of India (SEBI), it offers a viable solution by creating a virtuous cycle for flow of public and private finance. This model allows governments to build infrastructure and then monetise the de-risked assets through InvITs, using the unlocked capital to repay debt and fund new projects, without fiscal overhang. For the investors, InvITs function like mutual funds, pooling money from various investors to be invested in income-



28 https://mohua.gov.in/upload/whatsnew/59a4070e85256Transit_Oriented_Developoment_Policy.pdf
29 https://www.niti.gov.in/sites/default/files/2022-04/LVC&S_Workshop_Proceedings_25042022.pdf

generating infrastructure assets. They are designed to be listed on stock exchanges, providing liquidity and an easy exit option for investors. In a nutshell, they offer layered de-risking through multiple governance and management layers, typically comprising a Sponsor, Trustee, Investment Manager and Project Special Purpose Vehicles (SPVs). Further, InvITs are designed to maintain a balanced mix of assets, with at least 80% of their value derived from completed and revenue-generating projects, and up to 20% from under-construction or developmental assets. By aggregating assets of varying commercial maturity and risk profiles, InvITs achieve portfolio diversification, stabilising cash flows and improving overall creditworthiness relative to standalone projects or SPVs.

As listed instruments, InvITs enable transparent price discovery through active trading on stock exchanges. Investors benefit from periodic distributions including dividends, interest, and principal repayments, based on the cash flows generated by the underlying infrastructure assets. This structure makes InvITs particularly attractive to long-term institutional investors seeking predictable returns. Listing on the stock exchange also helps in easy exit for an investor at a market determined price.

To summarise the key essence, they are financial structures that enable 'take out' finance when projects arrive at revenue stage thereby can help governments unlock funds and reinvest in new projects while enabling long term private capital to come in at a derisked stage.

For an optimum applicability, state governments can borrow from MDBs, BFIs, or commercial sources, and use the finance to build green infrastructure. Similarly, they can seek funding from other institutions, such as sovereign wealth funds, or raise money through capital markets. As these loans would be against sovereign guarantees, governments could negotiate lower interest rates, lowering the finance cost. Once the construction risk is over, revenues have stabilised, and the projects have reached the exit stage (full completion or partial completion), the sponsor governments can settle InvITs and monetise the future earnings by issuing units. They can repay the debts and contract new debts without any overhang on fiscal deficit ceilings. It enables them to invest in new green projects. Private finance will replace public finance through these InvITs. This virtuous cycle would assist governments in scaling up the creation of green assets and achieving the green transition smoothly and on time.

First launched in India in 2016, the asset class has expanded to 27 InvITs, of which 17 are listed in India's stock exchange[30]. Further, in 2021, the central government launched the National Monetisation Pipeline (NMP) with a target of monetising assets worth approx. USD 68.34 billion between FY 2021–25. The initiative has been highly successful, achieving 95% of its target within the planned period. Building on this momentum, the Union Budget for FY 2025–26 proposed NMP 2.0, setting an ambitious goal of monetising readily available, revenue-generating assets worth USD 115 billion by 2030. These policy measures underscore the government's commitment to accelerating private investment in infrastructure, with platforms such as InvITs playing a pivotal role in enabling transparent, scalable, and long-term capital mobilisation[31] .

30 https://vinodkothari.com/wp-content/uploads/2023/05/Whitepaper-on-Infrastructure-Securitisation-A5.pdf
31 https://www.niti.gov.in/sites/default/files/2021-8/Vol_2_NATIONAL_MONETISATION_PIPELINE_23_Aug_2021.pdf

From amongst the ten states considered in this study, Maharashtra is the only state yet to have set up an InvITs. The Government of Maharashtra (GoM) has provided in-principal approval to setup Maha InvIT, wherein the Public Works Department (PWD), Maharashtra State Road Development Corporation (MSRDC) and Maharashtra Infrastructure Development Corporation will transfer selected revenue-generating assets under a special purpose vehicle (SPV) into the trust, unlocking capital for investment in new infrastructure projects.

Key Message: *InvITs as 'take out' instruments can free up public finance and recycle both equity and debt while ensuring easy entry and exits for long term investors*

The significance of Maharashtra InvITs is considerable for states as many states including Rajasthan have made explicit announcements in their Budget to use innovative financial instruments and structures including InvITs. In this regard, the proof of concept from Maharashtra serves as a replicable example.

6. Infrastructure Debt Funds (IDF)

Introduced in India in the early 2010s, IDFs were designed as take-out finance vehicles to refinance bank loans once projects became operational, extend maturities, and attract long-term institutional investors to de-risked infrastructure debt. Although not framed explicitly as green instruments at the time, IDFs align closely with today's climate finance needs. They offer long tenors, declining risk exposure, and stable cash flows, exactly the characteristics sought by insurance companies and pension funds.

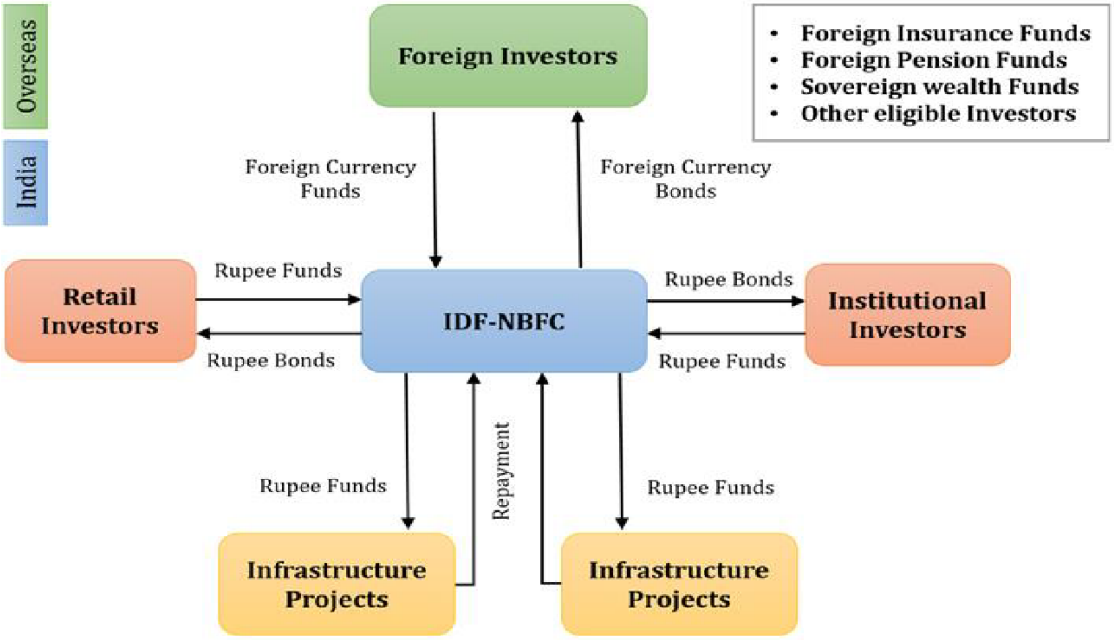


Figure 12: IDF Structure Source: Representation by Indicc Associates

In India, IDFs have refinanced operational road and power transmission projects with stable, annuity-like cash flows. Some domestic insurance capitals have also entered infrastructure debt through IDF instruments. These transactions demonstrated proof of

concept i.e. refinancing reduced debt-service stress, lowered financing costs, and freed bank capital for redeployment. For example, NIIF Infrastructure Finance Limited (NIIF IFL) is an IDF that is supporting project refinancing in several states.[32] IDFs can be repositioned as one operational layer within a broader climate finance architecture, working alongside InvITs, guarantees, viability gap funding, blended finance, and climate-linked bonds.

The Ministry of New and Renewable Energy of India has proposed to evaluate the requirement of long-term debt financing for green energy projects. The assessment could facilitate the use of 'take out' finance more widely while also correcting asset liability mismatch as domestic banks and financial institutions offer loan repayment periods of about 10-11 years, whereas several green energy projects have a span of 25 years or more. This could facilitate the use of IDFs and mobilisation of patient capital widely when the projects achieve the revenue stage, enabling a swift flow of concessional, commercial and public finance to new infrastructure projects.

Key Message: *IDF as takeout finance instruments can make debt move seamlessly from one investor to the other and can facilitate private capital debt at scale*

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32 https://solarquarter.com/2025/10/23/sunsure-energy-secures-%E2%82%B9133-crore-refinancing-from-niif-ifl-for-solar-ci-projects-in-uttar-pradesh/

CHAPTER III

CLIMATE FINANCE OPPORTUNITIES AT THE STATE LEVEL THROUGH SECTORAL LENS

While Chapter 2 deals with initiatives and instruments that can greatly help in mobilisation of climate finance, chapter III will reflect on the opportunity landscape in the 10 states considered in this report. These opportunities can be gleaned from state level sectoral policies, incentives contained in those policies and initiatives of the central government that can substantially pad up state level action. For this purpose, five key sectors namely Energy, Mobility, Urban Development, Agriculture and Industry have been considered[33].

1. Energy

Most studies focussing on the climate finance gap indicate that the energy sector would require a significant amount of finance. States have taken different approaches to articulate their respective Renewable Energy (RE) policies. Five of the ten states considered in this report, namely Andhra Pradesh, Assam, Bihar, Odisha and Rajasthan have an integrated RE policy which includes solar, wind and hydel power generation, storage (Battery Energy Storage Systems (BESS)/Pumped Storage), EV Charging Infrastructure linked to renewable energy (with the exception of Andhra Pradesh), and Green Hydrogen. They have also focussed on promotion of manufacturing clean tech in areas such as solar, wind turbine, battery and electrolyser, amongst others.

Notably the sectoral policies and incentives are investment oriented. In other words, their primary function is to leverage private sector participation, yet it cannot be ruled out that in some cases state-owned Public-Sector Enterprises (PSE) own transition plans can also add to identified targets. A staggered view of opportunities in these sectors and their sub sectors is provided below.

1.1. Generation

The policy overview of generation sector in energy policies of 10 states show a uniform trend. Specific targets are defined by most states for respective generation sources as shown in the table below.

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33 The opportunity landscape is not exhaustive but provides an insight into key opportunities

Table 2: Energy Targets as per State Policies

Sector / Sub-sector	Andhra Pradesh	Assam	Bihar	Gujarat	Jharkhand	Maharashtra	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
Solar	2024-29 additional Target 78.50 GW	2025-30 total target 5.2 GW	2025-30 total target 22.15 GW	71 GW by 2030. 2025-30 total RE target for 2035 150 GW	2022-27 total target 4 GW	Policy Lapsed	Target not defined but RPO targets at 21 GW by 2030	2024-29 total target 90 GW	Target not defined	2022-27 total target 22 GW
Wind	2024-29 additional Target 35 GW	NA	2025-30 total target 250 MW	42 GW by 2030	NA	NA	NA	2024-29 total target 25 GW	Focus on repowering to increase generation by 1.25 X	NA
Hydro	NA	2025-30 total target small hydro 100 MW	2025-30 Small Hydro Target 250 M	Clear Target Not Defined (Bundled targets available)	NA	NA	NA	NA	NA	NA
Green Hydrogen	2024-29 1.5 MTPA target	2025-30 2 MTPA target	0.25 MMTPA	75 GW RE capacity targeted for green Hydrogen projects	Strategic roadmap/Task Force	0.5 MTPA target	12 Green Hydrogen projects approved	2 MTPA target	2 MTPA target; Creation of hub in Tuticorin	2-22-27 1 MMTPA target

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As the percentage contribution of renewables in the nation's primary energy mix rises, the share of coal is expected to decrease even though it would increase on an absolute tonnage basis[34]. Amidst this dynamism are state level power generation utilities. For the 10 states observed under this study, state power generation utilities in all of them have some share of renewable energy already.

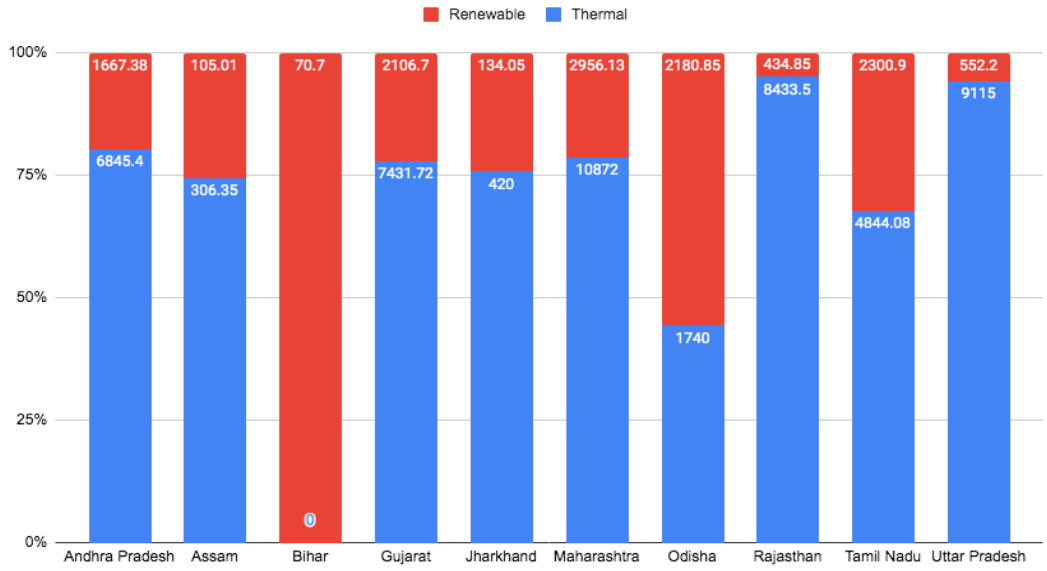

Figure 13: State Wise Thermal & RE Generation Mix (State GENCOs) ; Source: Indicc Analysis

With respect to thermal plants, typically they are due for retirement after 25 years of commissioning. The chart below shows that about 25 GW capacity of thermal power generation is already past 25 years across 10 states.

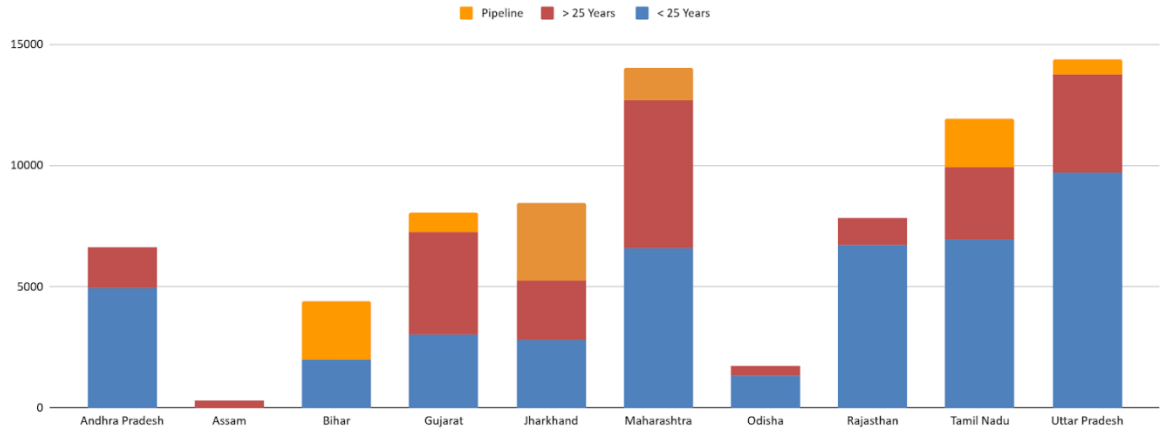

Figure 14: Age Profile of Thermal Power Plants of State Generation Companies; Source: Indicc Analysis

Even though, the Central Electricity Authority has issued an advisory[35] to all the thermal power utilities not to retire or repurpose their coal-based power stations before 2030, phasing out or retirement of units are best decided by Power Generating Utilities/Companies based on their own techno-economic, energy demand and

34 https://coal.gov.in/sites/default/files/2024-03/10-07-2024a-energy.pdf
35 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2043152&reg=3&lang=2

environmental reasons as electricity generation is a de-licensed activity under Section-7 of the Electricity Act, 2003.

Further, there are mandates by the Ministry of Power (MoP) on Renewable Purchase Obligation (RPO), Renewable Consumption Obligation (RCO) and Renewable Generation Obligation (RGO) nudging the states to diversify into renewable energy.

Table 3: RPO, RCO, RGO Overview

Aspect	Renewable Purchase Obligation (RPO)	Renewable Consumption Obligation (RCO)	Renewable Generation Obligation (RGO)
Legal Basis	Electricity Act, 2003 (Section 86(1)(e))[36]	Energy Conservation Act, 2001 (amended 2022, Section 14(x)) [27]	Tariff Policy 2016 under Electricity Act, 2003.[37]
Target Entities	Obligated entities (discoms, open access/captive users) without sector thresholds [23]	Designated consumers (specific high-energy sectors like cement/steel, discoms) with consumption thresholds [38]	New coal/lignite thermal plants (post-2023 COD)[39]
Core Requirement	Purchase percentage of renewable electricity from total consumption[40]	Consume minimum share from non-fossil/renewable sources (includes feedstock) [25]	Generate/procure RE equivalent to 40% of thermal capacity (voluntary for some)[26]
Scope and Fungibility	Limited to electricity purchases; some inter-category fungibility (e.g., wind/hydro) but varies by state [27]	Broader (energy/feedstock); fungible across wind/hydro/other RE, non-fungible for DRE shortfalls[25]	Generation-focused; allows bundling RE with thermal output, includes subsidiary contributions[24]
Compliance Options	Direct procurement or RECs; no buyout price[27]	Direct consumption, RECs, or CERC-fixed buyout price; group aggregation allowed[27]	Establish RE capacity or procure/supply equivalent; voluntary per clarifications[26]
Enforcement and Penalties	By SERCs, penalties under Section 142 (varies by state)[27]	By BEE/MoP; strict penalties under Section 26 (up to ₹10 lakh + daily fines) [27]	By MoP; voluntary, no explicit penalties[26]

Given the above and the fact that the Draft National Electricity Policy (NEP) 2026[41] also lays emphasis on integration of storage, and repurposing of older thermal units for grid support to enable greater renewable energy integration, it may be in order that Renewable Energy integration targets by state GENCOs are explicitly included in the state targets.

36 https://www.ceew.in/gfc/quick-reads/explains/what-are-rpo-and-rec
37 https://shaktifoundation.in/rgo-for-new-thermal-power-plants/
38 https://www.beeindia.gov.in/renewable-consumption-obligations-rco.php
39 https://www.eqmagpro.com/clarification-on-renewable-generation-obligation-rgo-eq/
40 https://neetiniyaman.com/rco-vs-rpo-energy-conservation-electricity-act/
41 https://iforest.global/wp-content/uploads/2025/09/Press-Release-English-JT-Maharashtra.pdf

The Department of Environment and Climate Change, Government of Maharashtra has developed a 10-year roadmap for transition in the Chandrapur-Nagpur–Yavatmal (CNY) region. CNY region is Maharashtra's coal heartland, contributing 100% of the state's coal production and nearly 50% of coal-fired power capacity. However, with depleting reserves and ageing plants, coal output is expected to fall by ~50% and thermal capacity by ~23% within the next decade. This underscores the urgency of transitioning towards a green and diversified economy. The transition is expected to unlock INR 5.4 lakh crore investment, generate 3.4 lakh jobs and 4% regional GDP growth to secure India's clean energy future. The blueprint identifies three Economic Development Nodes—Bhadrawati–Wani (Green hydrogen & green chemicals), Rajura–Chandrapur (Electric vehicles (EVs) & battery manufacturing) and Umrer (Semiconductors & advanced electronics) which can together repurpose 6,000 hectares of coal mine land into green energy and industrial hubs with a cumulative solar generation potential of 37 GW.

Source: iForest

Key Message: *Diversification of state-owned thermal generation assets may be made explicit to elicit greater investor interest. This could also reduce financing burden for grid infrastructure.*

1.2. Grid Infrastructure

With regards to Grid Infrastructure, there is a systemic 40%+ shortfall in delivering planned interstate and intrastate transmission assets as grid projects take 5-8 years on average for completion versus the 1-2 years for solar plants, creating an evacuation bottleneck. An unbalanced transition which fails to integrate firm, clean power could actually lock the country into coal-based generation as the default backup, compromising climate goals and would also perpetuate import dependence for fossil fuels.

In the transmission sector, significant opportunity exists with respect to the Green Energy Corridors (GEC) - an initiative in India designed to synchronize electricity produced from renewable sources, such as solar and wind, with the conventional national grid.[42] While the first phase of GEC (GEC-I) is near completion, a clear pipeline of projects is visible in the second phase of GEC (GEC-II) which runs until the end of the decade. Additionally, a third phase of GEC (GEC-III) has also been proposed in February of 2025.

Table 4: Opportunities in Green Energy Corridors

	GEC - I	GEC - II	GEC - III
Year of Launch	2015	2023	Proposed in Union Budget 2025-26
Completion Deadline	Originally 2023, some states extended to Dec 2025	2030	Not specified

42 Green Energy Corridors (GEC) is a transmission infrastructure programme for evacuating power from renewable energy-rich states through dedicated intra-state and inter-state transmission systems, substations, and grid-strengthening works to integrate variable renewable generation into the national grid

Implementing States	8 States (Andhra Pradesh, Gujarat, HP, Karnataka, MP, Maharashtra, Rajasthan, Tamil Nadu)	7 States (Gujarat, HP, Karnataka, Kerala, Rajasthan, Tamil Nadu, UP)	Andhra Pradesh has submitted plan, Gujarat has announced Investments
RE Integration Target	24 GW	20 GW	Not specified
Transmission Line Target	9700 ckm	10750 ckm	8862 ckm
Substation Target	22600 MVA	27500 MVA	9500 MVA
Total Project Cost	₹10,141.68 crore	₹12,031.33 crore	₹56,000 crore
Funding Mechanism	• 40% MNRE Grant • 40% KfW Loan • 20% STU Equity	• 33% MNRE Grant • 67% STU arranged (loans, Green Bonds etc.)	• 40% MNRE Grant • 40% Loan • 20% POWERGRID Equity
Green Financing Opportunity	N/A; Project Near Completion	STUs can use financing methods such as issuances of Green Bonds to fund their portion of the project	STUs can use financing methods such as issuances of Green Bonds to fund their portion of the project
Key Financial Partners	MNRE, KfW Germany	MNRE, DFIs (IREDA, REC, PFC), KfW	MNRE, POWERGRID
Achievements	9,136 ckm of lines and 21,413 MVA of substations constructed so far	Scheme launched; implementation underway	Proposed; not yet commissioned

Gujarat has announced an investment of ₹ 29,000 Crore for development of projects under GEC-III. The project would involve construction of 3,430 ckm (circuit kilometre) of transmission lines linked to six 765 kV substations and 860 ckm connected to four 400 kV substations in Kutch, Jamnagar-Bet Dwarka, Banaskantha-Patan, and central Gujarat[43].

Andhra Pradesh Transmission Company (TRANSCO) has also submitted its final proposals under the scheme. This entails connection of 11 Gigawatts of solar power and 7,373 Megawatts of Pumped Storage Hydropower Projects to the grid at an estimated cost of ₹28,033 crore with a focus on connecting inland RE generation sites with coastal load centres[44]. Other States have also been urged by the central government to submit their proposals for development of projects[45].

Additionally, large-scale nuclear and Small Modular Reactors (SMRs) are also being seen as a source of zero-carbon, firm baseload power, a strategic complement to RE for long-term energy security. Accordingly, the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act was enacted in 2025 with a view to increase share of nuclear energy from 38.78 GW in 2025 to 100 GW by 2047, with an

43 https://www.thehindu.com/news/national/andhra-pradesh/andhra-pradesh-transco-submits-final-proposal-for-green-energy-corridor-iii-to-cea-jmd-kirti/article69936148.ece
44 https://www.thehindu.com/news/national/andhra-pradesh/andhra-pradesh-transco-submits-final-proposal-for-green-energy-corridor-iii-to-cea-jmd-kirti/article69936148.ece
45 https://energy.economictimes.indiatimes.com/news/power/states-asked-to-submit-green-energy-corridor-proposals-complete-prepaid-metering-by-2025/121363755

interim milestone of 22.38 GW by 2031-32 with participation of the private sector. This would also require a significant investment in transmission infrastructure.

At the distribution side, a significant opportunity has become apparent due to increased footprint of decentralised energy systems. Current distribution systems are designed for unidirectional, bulk delivery to end-users. However, the injection of Distributed Renewable Energy (DRE) is fundamentally altering the grid's operational requirements. This transition from a unidirectional to a bi-directional flow creates technical stress and therefore requires technical upgradation. The primary challenge is that the financial and technical burden of managing these requirements rests entirely with the Distribution Companies (DISCOMs). Currently, energy-only contracts remain the norm, which fail to account for the flexibility and infrastructure resilience needed at the distribution level. This necessitates not only an evaluation of technical requirements but also financing which would enable better DRE integration.

These steps can be made effective through targeted, time-bound measures to catalyse a fundamental shift from funding isolated projects to financing an integrated, secure energy system. The measures, which are interdependent, necessarily have to be driven by clear, measurable outcomes and deadlines[46].

Key Message: *Investment in grid infrastructure is critical and can be effectively expanded and modernised by opening the sector for private sector participation, strengthening storage network as infrastructure, performance linked funding for grid modernisation and AI based grid management, amongst others.*

1.3. Storage

In order to address variability in electricity generation from RE, states have stepped up their efforts on the storage front for Battery Energy Storage Systems and Pump Storage Projects. The targets and pipelines in 10 states across these technologies puts this in perspective.

Table 5: Storage Targets as per Respective State Policies

AP	AS	BR	GJ	JH	MH	OD	RJ	TN	UP
2024-29 22.5 GW PSP target 25 GW BESS target	**2025-30** 2 GW by 2030 PSP 1 GW BESS	Cumulative 6.1 GWh by 2030 (1.6 GW PSP + 4.5 BESS)	Cumulative 4800 GWh target Establishment of 75 PSP units @ ₹75,000 crores	1.5 GW (Damodar Valley Corporation led)	NA	NA	10 GW combined target	2.9 GW pipeline	NA

Pumped Storage Projects deserve particular emphasis in this context as they can play a critical role in enabling firm and dispatchable renewable energy. Unlike stand-alone storage solutions, PSPs can support grid balancing at scale, absorb surplus renewable

46 https://sharmila.substack.com/p/transforming-indias-grid-for-a-renewable

generation during off-peak periods and supply power during periods of high demand. In this regard, Andhra Pradesh offers an important illustration.

> The integrated renewable energy project being developed by Greenko at Pinnapuram combines solar, wind and pumped hydropower storage in a single location and is designed to supply schedulable renewable power. The significance of such a model lies in demonstrating how solar and wind generation can be coupled with pumped hydro storage to improve reliability of renewable energy and support emerging uses such as green hydrogen and industrial decarbonisation.

From the perspective of state government involvement, the opportunities in BESS and PSP arise in two ways namely where the PPP route is explicitly highlighted and where state government is directly involved. Additionally, several states have also formulated battery recycling policies. This addresses end of life disposal and provides an enabling ecosystem for investment.

Further, the Ministry of Power amended the Electricity Rules 2005 to create a formal framework for Energy Storage Systems. The rules allow a wide range of entities including a new category of 'Independent Energy Storage Service Providers' to own, lease or operate ESS. Owners will be able to sell, lease or rent storage capacity to any entity enabling a "Storage-as-a-Service" model.

Effectively, this could allow broad range of entities to develop, own, lease, or operate ESS, including generating companies, transmission & distribution licensees, consumers (including C&I), system operators and independent energy storage service providers. Selling, leasing, or renting storage capacity, in whole or in part, to any consumer, utility, Load Despatch Centre, or other entity, will create diverse and bankable revenue streams while addressing intermittency of RE generation. This could also ensure financially stressed Distribution Companies (DISCOMs) to leverage ESS to manage peak loads more effectively, reduce their power purchase costs and improve reliability for end consumers, while also developing a nascent market allowing specialized players to offer 'storage-as-a-service'. In brief, the clear rules on ownership, market access, and commercial models provide the regulatory clarity needed to build robust financial models and deploy capital in a high-growth sector[47].

> Andhra Pradesh, under new Draft BESS Regulations released by Andhra Pradesh Electricity Regulatory Commission (APERC) creates a clear and structured environment for the development, ownership and operation of BESS. The rules, in addition to developing a diverse ownership & business model, intend to enhance the role of the aggregator who may bundle BESS resources from multiple sites, enabling smaller-scale systems to participate in providing grid services, thereby enabling a market for distributed energy resources.
>
> Source: Andhra Pradesh Electricity Regulatory Commission [Planning, Procurement, Deployment, and Utilisation of Battery Energy Storage Systems (BESS)] Regulations, 2025. APERC

47 https://www.mercomindia.com/government-notifies-rules-to-broaden-energy-storage-ownership-and-usage#:~:text=The%20Ministry%20of%20Power%20has%20notified%20the,as%20part%20of%20generation%2C%20transmission%2C%20or%20distribution.

In addition to the above, the Ministry of Power has also released an advisory promoting the co-location of Energy Storage Systems (ESS) with solar power projects. The advisory recommends incorporating a minimum 2-hour co-located ESS (equivalent to 10% of installed solar capacity) in future solar tenders, mitigating intermittency, improving cost efficiency due to potential reduction in power purchase costs during peak hours and increased transmission line utilization by maximizing the use of existing infrastructure[48].

***Key Message**: State and Central level initiatives open new opportunities for a vibrant storage market for higher RE penetration and create new markets.*

1.4. Green Hydrogen

Green hydrogen is crucial for hard-to-abate sectors because it produces zero carbon emissions when used as a fuel or feedstock, replacing fossil fuels in industries like steel, cement, chemicals, and long-haul transport, which are difficult to decarbonize otherwise.

The National Green Hydrogen Mission (NGHM), launched by the Ministry of New and Renewable Energy (MNRE) in January 2023, is a key policy initiative with a budget of INR 19,744 crore (approximately USD 2.5 billion). It offers holistic support to the sector through various mission components designed to generate demand, incentivise supply, and strengthen critical enablers of the green hydrogen ecosystem (MNRE 2023)[49]. Additionally, the Green Hydrogen Policy (GHP) by the Ministry of Power offers a waiver on inter-state transmission system (ISTS) charges and provides guidelines for sourcing renewable energy (RE) for green hydrogen projects, among other provisions (Ministry of Power 2022)[50].

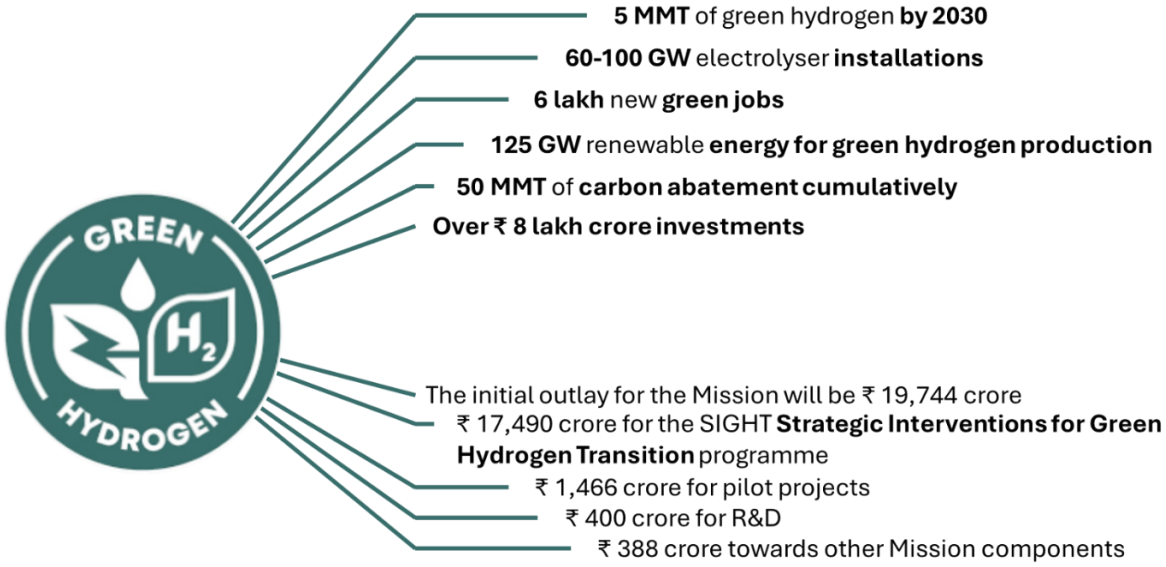

Figure 15: Green Hydrogen Targets; Source: Indicc

48 http://cea.nic.in/wp-content/uploads/notification/2025/02/Advisory_on_colocating_Energy_Storage_System_with_Solar_Power_Projects_to_enhance_grid_stability_and_cost_efficiency.pdf
49 https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2039091&reg=3&lang=2
50 https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2039091&reg=3&lang=2

Ministry of New and Renewable Energy has also issued guidelines for a ₹200 crore scheme to fund pilot projects for innovative and decentralised green hydrogen production (e.g. from biomass, wastewater) and utilisation (e.g. in cooking off-grid power generation) with a special focus on startups. By funding pilot projects in decentralised applications, the government aims to foster grassroots innovation, validate new technologies and business models and accelerate the adoption of hydrogen in sectors beyond large-scale industry. The initiative demonstrates a commitment to R&D and ecosystem building for next-generation clean technologies and strengthens India's position as an innovator showcasing a long-term vision for decarbonising hard-to-abate sectors and building a future hydrogen economy from the ground up[51].

Recent price discoveries have also improved the commercial outlook for green hydrogen in India. Under the National Green Hydrogen Mission, discovered prices for green hydrogen have fallen to ₹279 (around USD 2.97) per kg in a refinery-linked tender, setting a new benchmark for the sector. This follows other refinery-linked tenders where green hydrogen prices were also discovered in the USD 3 to 4 per kg range. In parallel, auctions under the SIGHT programme have resulted in discovery of globally competitive green ammonia prices in the range of ₹49.75 per kg to ₹55.75 per kg, compared to ₹100.28 per kg in 2024. These discoveries validate the policy framework under the National Green Hydrogen Mission and signal that India is moving towards cost-competitive production of green hydrogen and its derivatives at scale.[52]

Complementing these national policies, the states of Rajasthan, Maharashtra, Uttar Pradesh, Andhra Pradesh, and West Bengal have introduced green hydrogen policies, while Punjab and Haryana's policies are currently in the draft stage. With respect to the 10 states covered in this report, the targets for Green Hydrogen are as follows:

Table 6: Green Hydrogen Targets

Andhra Pradesh	Assam	Bihar	Gujarat	Jharkhand	Maharashtra	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
1.5 MTPA target [5]	2 MTPA target		75 GW RE capacity targeted for green Hydrogen projects [12]	Strategic roadmap/Task Force	0.5 MTPA target	12 Green Hydrogen projects approved	2 MTPA target	2 MTPA target; Creation of hub in Tuticorin	1 MTPA target

Key Message: *Green Hydrogen is amongst the few sectors with definitive targets.*

51 https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2025/08/20250804721426633.pdf

52 https://www.spglobal.com/energy/en/news-research/latest-news/energy-transition/021226-indias-numaligarh-hydrogen-tender-ends-at-record-low-rupees-279kg

2. Electric Mobility

India's electric mobility journey began with the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, launched in 2015. FAME provided the first big push by subsidizing EVs and supporting charging stations, creating a market signal for adoption and investment. FAME was introduced in two phases. Phase I (2015–2019) promoted early EV adoption through demand incentives and charging infrastructure support. FAME II (from April 2019 - 2924) was to support electric buses, two-, three-, and four-wheelers, and build EV charging infrastructure.

While FAME provided vital stimulus, its design centered largely on subsidizing purchases and infrastructure. The newer PM E-DRIVE (Electric Drive Revolution in Innovative Vehicle Enhancement) programme reflects a more holistic and strategic approach. Launched in September 2024 with an outlay of ₹10,900 crore, PM E-DRIVE seeks to unify incentives across vehicles, batteries, and charging systems, and embed localisation norms, interoperable standards, and ecosystem support mechanisms. Under PM E-DRIVE, only EVs equipped with advanced batteries qualify for demand incentives, and the scheme targets e-2Ws, e-3Ws, e-trucks, e-buses, ambulances, and public charging stations. The programme also signals potential tightening of domestic component requirement rules to deepen domestic value addition.

Importantly, the states play a decisive role in operationalizing the national vision. While central schemes provide direction and financial stimulus, it is at the state level where adoption incentives, tax exemptions, land allocation, and charging infrastructure rollouts are tailored to local contexts. States provide additional support in creating a competitive environment that directly shapes consumer choices and industrial investments.

From States' perspectives, three important areas deserve special attention. First, particular focus is needed on public transport run and managed by Strate Transport Utilities (STUs) and City Transport Utilities (CTUs). This is because India is not yet fully horizontal growth engine. Much of India's GDP comes from a handful of states. Similarly, much of states' GDP come from a handful of cities. This means that cities are the main hubs of employment and economic activity, where masses travel for work and vocation. Even as road networks expand and catalyse a more horizontal growth, it is important that bus transport, a critical area, is adequately addressed. This is of particular importance in light of the fact that recent policy environment prioritizes state transport undertakings (STUs) and city transport undertakings (CTUs) even as many state utilities are not yet market oriented and public finance remains constrained. Specific targets under this category are enunciated below.

Table 7: Policy Targets for E-Buses

Andhra Pradesh	Assam	Bihar	Gujarat	Jharkhand	Maharashtra	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
10,000 buses (APSRTC) by 2029 (100% electrification of fleet)	100% public transport buses by 2030	400 e-buses by 2030	Aims at a reduction of 32 MtCO2e (145% change over a baseline of 2018)		electrification of 40% of fleet sizing top six urban agglomerations	50% of all new city buses to be electric	675 e-buses (PM e-Bus Sewa)	30% of entire fleet to be electric by 2030	100% electric public transport in 17 cities by 2030

Key Message: *Only a few states have definitive bus procurement targets, however for different time frames. Be that as it may, public bus transport requires special attention*

The second area that deserves special focus from states' perspective is the electrification of government vehicle (excluding STU/CTU procurement). These vehicles used by state departments and government employees represent a significant share of mobility. Unlike STUs and CTUs, which operate large-scale passenger services, these fleets consist of administrative, departmental, and service vehicles that are often older, fuel-inefficient, and costly to maintain.

Table 8: Targets for Government Fleet Electrification

Andhra Pradesh	Assam	Bihar	Gujarat	Jharkhand	Maharshtra	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
Nomination-based (EESL)	All Govt. Vehicles to be electric by 2030 Procurement of only electric vehicles allowed after 2025		Aims at a reduction of 32 MtCO2e (145% change over a baseline of 2018) [14]	15yr old vehicles replacement mandate	New intra-city vehicles must be EVs	100% interest-free loans to staff			100% transition of government vehicles for official use to EVs by 2030

Key Message: *Most states do not have definitive targets for government fleet electrification.*

The third crucial area is the charging infrastructure. A robust charging network is central to EV transition, and policies at both the union and state level are evolving to address this area. Since, charging is de-licensed activity enabling any individual or entity to set up charging infrastructure, PPPs would be crucial in moving towards an efficient and cost sharing mechanisms at the state level.

Table 9: Targets for EV Charging Infrastructure

Andhra Pradesh	Assam	Bihar	Gujarat	Jharkhand	Maharashtra	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
1 station per 30 km on green routes; 3 km x 3 km grid in cities proposed	Creation of green corridors on major routes	Hubs in Patna (30 bus capacity) Govt departments to install 277 public charging stations over 5 years	Aims at a reduction of 32 MtCO2e (145% change over a baseline of 2018) [14]	1 station every 25 km on highways; 3 km x 3 km grid in cities	"EV-ready" govt complexes Facility every 25 km on highways			Sites every 25 km on highways	Grid of 3 km x 3 km in cities

Key Message: *Definitive targets across states for charging infrastructure currently do not exist as they are contingent upon EV uptake*

3. Clean Tech Manufacturing

Clean tech manufacturing is considered as an enabling activity towards green transition and hence qualifies for climate finance. The National Manufacturing Mission, announced in 2025, serves as the policy anchor for this transformation. By deepening domestic value addition (DVA), India can secure its energy future, add USD 20-30 billion to its annual GDP by 2030, and create over 1.8 million high-quality jobs[53].

As per the central thesis of the recently released blueprint on 5th February,2026, clean energy expansion can translate into tangible industrial capability by capturing a market projected to reach USD 90-135 billion annually by 2030, mitigating geopolitical risks associated with concentrated supply chains, and foster MSME growth and large-scale employment in Tier 2 and Tier 3 cities. This could also lead to potential economic gains of USD 48-68 billion through prevention of cumulative foreign exchange outflows, will contribute towards annual addition of USD 20-30 billion, job creation for 1.8 million people and unlock (USD 1.1-1.7 billion in R&D and innovation)[54].

Table 10: Market Opportunities in Cleantech (2030 projections) Source: Bharat Climate Forum

Sector	Current Demand (2025)	Conservative 2030 Projection	Optimistic 2030 Projection
Solar PV	26 GW	80 GW	97 GW
Wind Power	4 GW	10 GW	14 GW
Battery Storage	24 GWh	173 GWh	273 GWh
Electric Vehicles	2.2 M Vehicles	10 M Vehicles	17 M Vehicles
Green Hydrogen	0.01 MMTPA	1.20 MMTPA	3.40 MMTPA

53 Blueprint for India's Cleantech Manufacturing Ambition: Bharat Climate Forum
54 https://niti.gov.in/sites/default/files/2026-02/Scenarios-Towards-Viksit-Bharat-and-Net-Zero-%20An-Overview-Vol1.pdf

HVDC Transmission	3,000 ckm	12,000 ckm	17,000 ckm

Overall, the transition would require INR 1.85-2.45 lakh crores in catalytic public funding to unlock INR 4.5-7 lakh crores in private investment. Success depends on seamless coordination between the National Manufacturing Mission, line ministries, and the private sector to move from intent to high-speed execution.

As Department for Promotion of Industry and Internal Trade (DPIIT) lays out the design of the National Manufacturing Mission, together with all the line ministries, the cleantech manufacturing agenda can gather momentum and create new avenues of collaboration. These collaborations will unfold on the back of numerous initiatives by line ministries and regulators.

For instance, the Central Electricity Authority (CEA) has launched an initiative to promote domestic manufacturing of 29 critical power sector components that are currently imported, inviting stakeholder collaboration to create a roadmap that could lead to a PLI-like scheme. This policy allows India to frame its climate action within a development-centric model that builds domestic industrial capacity, creates jobs and ensures energy security. It presents a powerful argument for the Global South that the energy transition must support and not hinder national industrial development.

The Ministry of New and Renewable Energy (MNRE) has also stressed that entire process from "black wafer" to cell in solar manufacturing must occur in India. The idea is to promote investment in upstream higher-value stages of the solar manufacturing supply chain and move beyond simple module assembly to build a fully integrated and self-reliant solar ecosystem reducing dependence on imported components and strengthening the 'Make in India' initiative that ensures long-term energy security and industrial sovereignty.

The Ministry of Heavy Industries too has mandated stricter timelines for the domestic manufacturing of key EV components for e2W, e3W, e-buses, amongst others, prohibiting the import of assembled battery modules and completely knocked down (CKD) kits from a single supplier for certain vehicle categories. This will enable localisation of the EV supply chain compelling manufacturers to move beyond assembly and develop a robust domestic component ecosystem.

The Scheme to Promote Manufacturing of Electric Passenger Cars (SPMEPCI) allows global EV manufacturers committing to a minimum investment of ₹4150 crore (approx. USD 500 million) to import a limited number of cars at a reduced customs duty of 15% in return for achieving 50% Domestic Value Addition (DVA) by the fifth year, making it an aggressive strategy to attract major global EV players and their technology to India.

The Ministry of Heavy Industries has introduced incentives for electric trucks (N2 and N3 categories) under the PM E-DRIVE scheme with a ₹500 crore outlay to support approximately 5600 e-trucks. The incentive is linked to battery capacity and vehicle price

with a cap up to ₹9.6 lakh per vehicle. The scheme mandates extensive battery warranties and ties incentives to scrapping old ICE trucks. This is the government's first dedicated scheme targeting the decarbonisation of the high-emission freight sector which accounts for 42% of transport emissions.

Further, the Ministry of Finance amended the Income-tax rules to include lithium-ion batteries for EVs under specific provisions related to income not deemed to arise in India for non-residents, providing tax predictability for non-residents. Greater tax certainty for multinational corporations the government aims to accelerate the development of a domestic battery manufacturing ecosystem critical for the EV industry's success.

The following table summarises the position of the ten states examined in this report on clean-tech manufacturing targets.

Table 11: Targets for Clean Tech Manufacturing

Andhra Pradesh	Assam	Bihar	Gujarata	Jharkhand	Maharashtra	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
Solar	20 GW photovoltaic manufacturig capacity [5]	3 GW of photovoltaic manufacturing capacity	NA	NA	NA	NA	NA	NA	NA
Wind	NA	NA	NA	NA	NA	NA	NA	NA	NA
Battery	Target 5000 MWh of battery manufacturing capacity [5]	2,000 MWh of manufacturing capacity	NA	NA	Targets establishment of Advanced Chemistry Cell (ACC) battery projects in the state by 2027	NA	NA	NA	NA
Electrolyzer	3000 MW capacity targeted [5]	Target 3000 MW capacity	NA	NA	NA	NA	NA	NA	NA
EV Targets	100 incubation centers focused on e-mobility startups by 2029	NA	NA	NA	NA	NA	NA	35 Lakh units per year output target	NA

A critical consideration towards mobilising the capital for this purpose is the cost of capital. In China, the cost of capital for clean tech manufacturing is around 3–4% while in India, it ranges between 9–14%. In this regard, the Economic Survey 2025-26 argues that economies that generate sustained external surpluses through exports, productivity and financial depth can finance investment cheaply and stably at home. In other words, for the cost of capital to fall durably, India will need to deepen manufacturing, financial markets and export competitiveness. The domestic clean tech manufacturing provides an immense opportunity in that regard[55].

Additionally, the newly introduced Carbon Credit Trading Scheme (CCTS) can be considered as the long-term financing engine needed to build the domestic clean tech manufacturing capability. Auctioning of allowances or credits in the CCTS, where one allowance equals one tonne of CO2 emissions, can generate significant revenue for the

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government. A practical pathway is to establish a Cleantech Manufacturing Fund, capitalised by CCTS revenues and jointly managed by the Ministry of Finance and the National Manufacturing Mission, with a mandate linked to outcomes such as cost reductions, innovation and supplier upgrades[56]. CCTS, however, should be deployed for residual emissions.

Key Message: *Clean tech manufacturing can immensely add to deepening of manufacturing base and can boost India's exports thus bringing the cost of capital down. States could identify specific targets on clean tech manufacturing to provide impetus to the sector.*

4. Urban Development

India's cities require an estimated capital investment of USD 840 billion in urban infrastructure and municipal services in the 15 years till 2036 (in 2020 prices). Over half of these investment needs i.e. almost USD 450 billion are in basic municipal services (i.e., water supply, sewerage, municipal solid waste management (SWM), storm water drainage, urban roads and streetlighting), while the rest i.e. USD 300 billion are for mass transit[57].

The Government of India has launched several Centrally Sponsored Schemes (CSS), including the Atal Mission for Rejuvenation and Urban Transformation (AMRUT 2.0), the Swachh Bharat Mission-Urban (SBM-U 2.0) and the Pradhan Mantri Awas Yojana-Urban (PMAY-U) to provide much needed impetus to urban development. These initiatives have been instrumental in creating a national framework for urban renewal. They have established standardized, ambitious goals such as 'Har Ghar Jal' (water to every household) and 'Garbage-Free Cities' and mandated the preparation of City and State Action Plans.

While these initiatives provide foundational funding, their financial envelopes are insufficient to cover the total investment required for incremental urban development. In a way, their primary function is more strategic than providing capital support. The action plans developed under these missions, such as City Water Balance Plans (CWBPs) and City Solid Waste Action Plans (CSWAPs), do more than outlining policy. They effectively indicate government-vetted and viable pipeline of unfunded or partially funded infrastructure projects. This process of systematically identifying and quantifying the infrastructure gap creates a clear and structured entry point for Multilateral Development Banks (MDBs), Bilateral Financial Institutions (BFIs), Development Finance Institutions (DFIs) and private sector finance to step in and fund green projects that are

56 https://www.hindustantimes.com/ht-insight/climate-change/carbon-credit-trading-scheme-revenues-can-power-india-s-cleantech-future-101760937908699.html

57 https://www.worldbank.org/en/news/press-release/2022/11/14/india-s-urban-infrastructure-needs-to-cross-840-billion-over-next-15-years-new-world-bank-report

already aligned with national and state priorities, significantly reducing initial due diligence hurdles.

In that sense, these national initiatives function as powerful market-signalling and market-making mechanisms. The standardization of projects under national frameworks aggregates and structures information, which lowers transaction costs for potential financiers. In essence, the centrally sponsored schemes enable large-scale capital to flow into a sector that were otherwise fragmented and opaque to be considered as a coherent asset class.

In addition to the Centrally Sponsored Schemes discussed above, the urban development landscape is also being shaped by other initiatives of the Centre and the States such as the Smart Cities Mission, metro rail expansion, city-level water and sewerage reforms and incentives for municipal bond issuances. In this landscape, municipalities assume a central role as they remain the primary public entities responsible for delivery of water supply, sewerage, solid waste management, storm water drainage and several aspects of urban mobility. Their role is not confined to implementation alone. They are also expected to identify projects, improve financial and accounting frameworks, prepare pipelines of bankable projects and increasingly access market-based finance either directly or through pooled structures. This is of particular relevance because the effectiveness of urban climate finance will depend not only on policy support from the Centre and States, but also on the institutional and financial readiness of municipalities.

With respect to specific targets on urban development in the 10 states considered in the report, it is difficult to quantify all of them. However, an indicative list is provided below.

Table 12: Indicative List of Urban Development Opportunities Across States

State/Central	Scheme/Policy Name	Key Features	Cities Covered	Funding/Budget	Validity Period	Source/Reference
Central Government	Atal Mission for Rejuvenation and Urban Transformation 2.0 (AMRUT 2.0)	Water supply, sewerage, green spaces, urban transport infrastructure, circular economy focus	500 cities nationwide	Rs 2,77,000 crore (2021-2026)	2021-2026	Ministry of Housing and Urban Affairs (MoHUA), Government of India
	Smart Cities Mission	Integrated Command and Control Centers (ICCC), smart infrastructure, ICT-enabled services	100 cities (selected through competition)	Rs 48,000 crore (extended to March 2025)	Extended to March 2025	Ministry of Housing and Urban Affairs (MoHUA)
	Pradhan Mantri Awas Yojana - Urban (PMAY-U)	Affordable housing for urban poor, 4 verticals: in-situ slum redevelopment, credit-linked subsidy, affordable housing in partnership, beneficiary-led construction	All statutory towns and cities	Rs 2,00,000 crore (target: 3 crore additional houses)	Ongoing	Ministry of Housing and Urban Affairs (MoHUA)
	Swachh Bharat Mission - Urban 2.0 (SBM-U 2.0)	Garbage-free cities, scientificwaste management, comprehensive sanitation	All urban local bodies	Ongoing funding	Active (2021 onwards)	Ministry of Housing and Urban Affairs (MoHUA)
	Heritage City Development and Augmentation Yojana (HRIDAY)	Heritage city preservation, infrastructure development	12 heritage cities	Government funding	Active	Ministry of Housing and Urban Affairs (MoHUA)
Andhra Pradesh	AMRUT Cities Program - Andhra Pradesh	Water supply and sewerage improvements under AMRUT	17 cities	Central and State funding under AMRUT	Ongoing under AMRUT 2.0	Andhra Pradesh Urban Finance & Infrastructure Development Corporation
	Smart City - Visakhapatnam	Smart infrastructure, ICT services, area-based development	Visakhapatnam	Rs 2,100 crore (approx)	Extended to 2025	Visakhapatnam Smart City Corporation Limited
	Amaravati Capital City Development	Capital region infrastructure development	Amaravati capital region	State budget allocation	Ongoing	Andhra Pradesh Capital Region Development Authority (APCRDA)
Assam	AMRUT Cities Program - Assam	Water supply, sewerage, urban transport	7 cities: Guwahati, Silchar, Dibrugarh, Jorhat, Nagaon, Tezpur, Tinsukia	Central and State funding	Ongoing under AMRUT 2.0	Assam Urban Water Supply and Sewerage Board
	Smart City - Guwahati	Smart infrastructure, integrated command center, heritage preservation	Guwahati	Rs 2,873 crore	Extended to 2025	Guwahati Smart City Limited
Bihar	AMRUT Cities Program - Bihar	Water supply, sewerage infrastructure	26 cities	Central and State funding	Ongoing under AMRUT 2.0	Bihar Urban Infrastructure Development Corporation
	Smart Cities - Bihar	Smart infrastructure, intelligent transport systems	Patna, Bhagalpur, Muzaffarpur, Bihar Sharif	Rs 8,000+ crore combined	Extended to 2025	Bihar State Smart City Mission

Gujarat	AMRUT Cities Program - Gujarat	Water supply, sewerage, green spaces	31 cities	Central and State funding	Ongoing under AMRUT 2.0	Gujarat Urban Development Company Limited (GUDCL)
	Smart Cities - Gujarat	Smart infrastructure, ICT integration	Ahmedabad, Surat, Vadodara, Rajkot, Dahod, Gandhinagar (6 cities)	Rs 13,000+ crore combined	Extended to 2025	Gujarat Smart City Mission
	Gujarat International Finance Tec-City (GIFT City)	International Financial Services Centre with special regulatory framework	GIFT City, Gandhinagar	Rs 78,000 crore (total project value)	Ongoing development	GIFT City Authority, Gujarat International Finance Tec-City Company
Jharkhand	AMRUT Cities Program - Jharkhand	Water supply, sewerage improvements	10 cities including Ranchi, Jamshedpur, Dhanbad	Central and State funding	Ongoing under AMRUT 2.0	Jharkhand Urban Infrastructure Development Company
	Smart City - Ranchi	Smart infrastructure, area-based development	Ranchi	Rs 2,100 crore (approx)	Extended to 2025	Ranchi Smart City Corporation Limited
Maharashtra	AMRUT Cities Program - Maharashtra	Water supply, sewerage, urban transport	43 cities (highest among all states)	Central and State funding	Ongoing under AMRUT 2.0	Maharashtra Urban Infrastructure Development Company (MUIDC)
	Smart Cities - Maharashtra	Smart infrastructure, integrated services	Pune, Nagpur, Nashik, Thane, Solapur, Aurangabad, Kalyan-Dombivli, Pimpri-Chinchwad (8 cities)	Rs 18,000+ crore combined	Extended to 2025	Maharashtra State Smart City Mission
	Mumbai Metro Expansion	Multi-corridor metro network expansion	Mumbai Metropolitan Region	Rs 1,50,000+ crore (multiple lines)	Ongoing (various completion dates)	Mumbai Metropolitan Region Development Authority (MMRDA)
	Mumbai-Nagpur Samruddhi Mahamarg	701 km expressway as industrial corridor	Connecting Mumbai to Nagpur	Rs 55,000 crore (approx)	Operational (2022)	Maharashtra State Road Development Corporation (MSRDC)
Odisha	AMRUT Cities Program - Odisha	Water supply, sewerage infrastructure	19 cities	Central and State funding	Ongoing under AMRUT 2.0	Odisha Water Supply and Sewerage Board
	Smart City - Bhubaneswar	Smart infrastructure, intelligent operations center	Bhubaneswar	Rs 2,700 crore (approx)	Extended to 2025	Bhubaneswar Smart City Limited
Rajasthan	AMRUT Cities Program - Rajasthan	Water supply, sewerage, urban transport (first state to submit State Annual Action Plan)	28 cities	Central and State funding	Ongoing under AMRUT 2.0	Rajasthan Urban Infrastructure Development Project (RUIDP)
	Smart Cities - Rajasthan	Smart infrastructure, heritage preservation	Jaipur, Kota, Udaipur, Ajmer (4 cities)	Rs 9,000+ crore combined	Extended to 2025	Rajasthan State Smart City Mission
Tamil Nadu	AMRUT Cities Program - Tamil Nadu	Water supply, sewerage, green infrastructure	32 cities (formerly 26, expanded)	Central and State funding	Ongoing under AMRUT 2.0	Tamil Nadu Water Supply and Drainage Board

	Smart Cities - Tamil Nadu	Smart infrastructure, ICT services (highest number of Smart Cities)	Chennai, Coimbatore, Madurai, Salem, Vellore, Thanjavur, Tiruppur, Thoothukudi, Tiruchirappalli, Tirunelveli, Erode (11 cities)	Rs 25,000+ crore combined	Extended to 2025	Tamil Nadu State Smart City Mission
	Chennai Metro Expansion - Phase 2	Metro rail network expansion	Chennai and suburbs	Rs 61,843 crore	Under construction (completion by 2026-27)	Chennai Metro Rail Limited (CMRL)
	Chennai-Bengaluru Industrial Corridor (CBIC)	Industrial corridor with infrastructure development	Along Chennai-Bengaluru route	Multiple projects	Ongoing	National Industrial Corridor Development Corporation
Uttar Pradesh	AMRUT Cities Program - Uttar Pradesh	Water supply, sewerage, urban transport (highest number of AMRUT cities)	60 cities	Central and State funding	Ongoing under AMRUT 2.0	Uttar Pradesh Jal Nigam
	Smart Cities - Uttar Pradesh	Smart infrastructure, intelligent transport systems	Lucknow, Kanpur, Agra, Varanasi, Aligarh, Moradabad, Saharanpur, Bareilly, Jhansi, Prayagraj (10 cities)	Rs 22,000+ crore combined	Extended to 2025	Uttar Pradesh State Smart City Mission
	Lucknow Metro	Metro rail network	Lucknow	Rs 6,928 crore (Phase 1)	Operational; expansion ongoing	Uttar Pradesh Metro Rail Corporation (UPMRC)
	Uttar Pradesh Defence Industrial Corridor	Defence manufacturing infrastructure	5,000 hectares across 6 cities: Agra, Aligarh, Lucknow, Kanpur, Jhansi, Chitrakoot	Rs 20,000 crore (targeted investment)	Ongoing development	Uttar Pradesh Expressways Industrial Development Authority (UPEIDA)

Key Message: *Standardization of projects under national frameworks on urban development aggregates and structures information which can enable large-scale capital to flow into a sector that was otherwise fragmented and opaque to be considered as a coherent asset class. However, Identification of green projects in the urban development sector would require a detailed vetting of projects with green taxonomy.*

5. Agriculture

India's food system is placed amidst three mutually reinforcing challenges namely climate change, food security and nutritional security. This implies that systemic stress on agricultural systems perpetuated by standardized and resource heavy monoculture model is ill-equipped to handle the localized and varied impacts of a changing climate.

In this regard, sustainable agriculture has emerged as a key area that addresses the interconnected challenges of the food-energy-water by reducing input costs, conserving resources and enhancing resilience to environmental changes.

Within the umbrella of sustainable agriculture, Natural Farming (NF) has emerged as a scalable model in the Indian context. Accordingly, National Mission on Natural Farming (NMNF), a standalone Centrally Sponsored Scheme was launched in November 2024 to promote chemical-free, ecosystem-based natural farming rooted in traditional knowledge. It is aimed towards improving soil health, restoring ecosystems and reducing input cost to the farmer through scientifically backed approaches to achieve sustainability, climate resilience and safe food.

The other key policy enabler is the PM Programme for Restoration, Awareness Generation, Nourishment, and Amelioration of Mother-Earth (PM-PRANAM). This scheme represents a sophisticated evolution in agricultural policy, moving away from direct, input-based subsidies towards a smarter, outcome-based incentive structure. Instead of simply subsidizing fertilizer sales, a practice that encouraged overuse and created a massive fiscal burden, PM-PRANAM uses fiscal federalism to drive behavioural change.

The scheme's innovative mechanism incentivizes states to reduce their consumption of chemical fertilizers (Urea, DAP, NPK, MOP) compared to previous 3 years' average consumption, by offering them a grant equivalent to 50% of the resulting subsidy savings for the central government. Of this grant, 70% is earmarked for creating infrastructure for alternative fertilizer production, while the remaining 30% can be used to reward farmers, FPOs, and SHGs who contribute to the reduction.

This aligns the financial interests of the Centre and the states, empowering states to champion locally suited sustainable practices because they now have a direct financial stake in the outcome. Under PM-PRANAM, 14 states have shown a reduction of 15.14 (Lakh Metric Tonnes) LMT in consumption of chemical fertilizers during FY 2023-24 as compared to the average consumption of previous three financial years[58].

In addition to the above, financial intermediaries have evolved from traditional credit providers to comprehensive enablers of agricultural sustainability, each leveraging their institutional strengths. NABARD's policy influence and refinance capacity, cooperatives'

58 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2116211

grassroots outreach, RRBs' rural focus, and NBFCs' innovation creates an integrated ecosystem supporting India's climate-smart agriculture transformation across states.

Most recently, The Reserve Bank of India (RBI) has also proposed to include expenses related to technology innovations like soil testing, real-time weather forecasts, and organic/good agricultural practices certification, to be eligible for farm loans. These will be covered within the 20 per cent additional component currently allowed towards repairs and maintenance of farm assets.

At the state level, several initiatives to promote natural farming are underway, however, unlike some other sectors specific targets are not explicitly stated nor are the details on how states are undertaking the natural farming transformation.

Table 13: Key Sustainable Agriculture Initiatives in 10 States

Andhra Pradesh	Assam	Bihar	Gujarat	Jharkhand	Maharashtra	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
APCNF	APART project supported by World Bank for strengthening Farmer Producer Companies (FPCs); Xamahar fund for supporting innovative approaches in agriculture value chain	SAF and PRADAN empowering women through training on sustainable techniques Govt providing support through subsidies for organic input	iKhedu digital portal for ease in DBTs "from field to fanshop" project for supporting farmers to transition to certified organic production	₹100cr fund; ₹30k/acre assistance for organic farming		Odisha Millets Mission (OMM) for reviving traditional crops to address nutritional security, climate resilience and livelihood	Implementation of phased natural farming practices in 12 districts by the state government (Announced in Budget)		Promotion of Organic farming in clusters and in 5km zone on both side of river Ganga

However, one case study from Andhra Pradesh stands out. This pertains to AP Community-managed and climate-resilient Natural farming (APCNF) which has promoted a transformational shift that safeguards collective future by incorporating the best global agroecology principles for climate change adaptation. The different NF practices include traditional practices of farmers, and farmers own innovations, in conjunction with emerging paradigms.

The scaling of NF in Andhra Pradesh exemplifies how sub-national institutions can attract and leverage green finance through multi-level partnerships. Funding from national schemes (RKVY, PKVY), multilateral institutions (KfW, GEF), and philanthropy (Azim Premji Foundation, CoImpact) has supported the expansion from 40,000 farmers in 2016 to nearly 0.9 million in 2023. The programme's collaboration with departments of agriculture, education, and women and child development ensures cross-sectoral integration, while partnerships with TTD, AMUL, and Phalada enable market linkages for sustainably produced goods. The Indo-German Global Academy for Agroecology Research and Learning (IGGAARL) further enhances scientific credibility and international knowledge exchange, signalling confidence among global development partners.

In Rajasthan, a government commissioned policy study shows that with a 20 percent scale of Natural farming, the state of Rajasthan can save upto USD 96-100 million. Such savings or part of it can be potentially escrowed to provide a part of transition funding.
Key Message: *Natural farming can potentially reduce input costs for farmers, reduce energy subsidies, create new post-harvest markets as well as new markets for inputs. States can attract investments in this sector through identification of specific targets and repurposing subsidies, amongst other things.*

6. Sustainable Industrialization

Sustainable Industrialisation is driven by a combination of many factors. Chief amongst them would be direction and preference of capital; policies and incentives provided by governments; and action by the private sector. For many countries around the world including India where sustainability is increasingly recognised as a strategic need for national self-reliance and development, a tight compact needs to be stitched between policy landscape and corporate action. Interestingly, all the 10 states considered in this report demonstrate policy pronouncements and incentives towards ushering in sustainable industrialisation.

Even though state specific targets are not explicitly defined, a review of state industrial policies reveals a consistent shift toward embedding sustainability as a key pillar of industrial growth. Common themes such as resource efficiency, green innovation, and circular economy integration feature prominently, although each state adopts distinct strategies tailored to its economic and environmental priorities. The major sustainable strategies identified across the states are maximizing resource efficiency through water conservation and Zero Liquid Discharge (ZLD) measures, advancing green energy transition via captive renewables and grid-connected power, strengthening waste management with robust ETP/CETP and pollution control measures, building social and infrastructure support such as “walk-to-work” housing and MSME-focused green parks and policy innovation through certifications and targeted subsidies that reward environmental performance.

Some states, like Tamil Nadu have embarked upon comprehensive initiatives for Net Zero Industrial Parks. It is based on the Net Zero Industrial Park Framework, a comprehensive guidance document published by a consortium including the World Scientific Publishing Co., the Ministry of Trade and Industry, Singapore, and the Singapore University of Technology and Design. The framework is designed to provide guidance on planning, emissions accounting, and mitigation strategies for achieving low carbon and Net Zero Industrial Parks.

For a structured approach towards Sustainable industrialisation two components will be essential. **First,** a ‘Climate Vulnerability Assessment’ to support evidence-based interventions for brownfield and green field industrialisation. This will help in evaluating both infrastructure-specific vulnerabilities, including those related to buildings,

The Tamil Nadu Net Zero Industrial Parks entails measures that require emissions tracking, energy efficiency improvements, and renewable energy adoption in an incremental way. Other critical interventions include integrated multi-stakeholder planning engaging operators, government, and tenants; site selection prioritizing brownfield development and proximity to low-carbon freight infrastructure; renewable energy deployment combining onsite solar with long-term offsite PPAs; industrial symbiosis enabling waste diversion through inter-tenant resource exchanges; and Zero Liquid Discharge systems eliminating wastewater emissions. Phased Net Zero targets—2030 (exemplary), 2040 (advanced), 2050 (essential)—align with Paris Agreement trajectories while accommodating developing economy contexts. The framework's current scope is designed with a special focus on Tamil Nadu and specifically targets light industries and manufacturing sectors for its initial implementation.

drainage, power, and transport systems as well as and non-infrastructure vulnerabilities, such as workforce exposure and socioeconomic sensitivities. These parameters can be conceptually grounded in methodologies and indicators drawn from the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports AR6, AR5, and AR4. **Second,** corporate transition planning would be needed through a framework that allows disclosures and reporting in a convenient way for large as well as Medium, Small and Micro Enterprises (MSME).

Key Message: *Much on the line of Tamil Nadu Net Zero Industrial Parks, states can create robust frameworks for greenfield and brownfield industrial zones*.

CHAPTER IV

VISUALIZATION OF SECTORAL INCENTIVES, READINESS OF STATE PUBLIC ENTITIES, AND MUNICIPALITIES TO MOBILISE CLIMATE FINANCE

Chapter III provided insights into targets of respective sectoral policies namely Energy, Mobility, Urban Development, Agriculture and Sustainable Industrialisation. The central idea was to broadly understand the climate finance opportunities in these sectors across 10 states along with commentary on initiatives from the central government that can enable state level action. It also briefly dealt with areas that need more attention at the state level in respective sectors.

Chapter IV will deal with high level assessment of readiness at the state level to implement these policies. In this context, it will help to first understand the layout of incentives that the sector polices entail in 10 states and then to get a sense of readiness of Public Sector Entities and Municipalities.

1. Incentives in Energy Sector

While most of the states under consideration provide elaborate incentives for RE infrastructure, RE manufacturing, Green Hydrogen and Energy Storage Systems, two states - Gujarat and Tamil Nadu stand out in terms of absence of incentives in their polices, especially for RE infrastructure. For Gujarat, one possible rationale is that state is already amongst the top two states in terms of installed RE capacity signalling a matured RE market. On the other hand, Tamil Nadu has taken a route which is distinct from other states.

Table 14: Incentives in Energy Sector as per respective Renewable Energy Policies

Incentive Theme	Andhra Pradesh	Assam	Bihar	Gujarat	Jharkhand	Odisha	Rajasthan	Tamil Nadu	Uttar Pradesh
Capital Subsidy	Yes	Yes	No	Yes	Yes	No	No	No	Yes
SGST Exemption/ Reimbursement	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Electricity Duty Exemption	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Stamp Duty Exemption	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
Land Conversion Fee Exemption	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes
Transmission/Wheeling Charge Exemption	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Cross Subsidy Surcharge (CSS) Exemption	Yes	Yes	No	Yes	No	Yes	Yes	No	No
RE Manufacturing Incentives	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Green Hydrogen Incentives	Yes	Yes	Yes	No	No	Yes	Yes	No	No
Energy Storage (BESS/PSP) Incentives	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes

While most of the states have recently formulated integrated RE policies, Tamil Nadu has formulated separate policies for small hydel, pump storage and wind repowering and refurbishment, thereby designing separate frameworks and specific interventions for the management of the RE landscape in the state. As incentives provisioning signal a state's clear intent to promote the sector, the cumulative incentive regime looks promising even though in some cases incentives are provided without specific targets and time frames.

On Green Hydrogen, three states namely Gujarat, Tamil Nadu and Odisha, provide support through their industrial or power sector–related policies. Some state-level policies offer financial incentives and exemptions for both power- and non-power-related aspects, while others offer only one of the two.

As per a recent study, seven states namely Odisha, Maharashtra, Tamil Nadu, Uttar Pradesh, Rajasthan, Gujarat, and Andhra Pradesh together represent 92 per cent of the potential support across all states that have state-level green hydrogen policies or green hydrogen in their integrated RE policies (except Assam).[59]

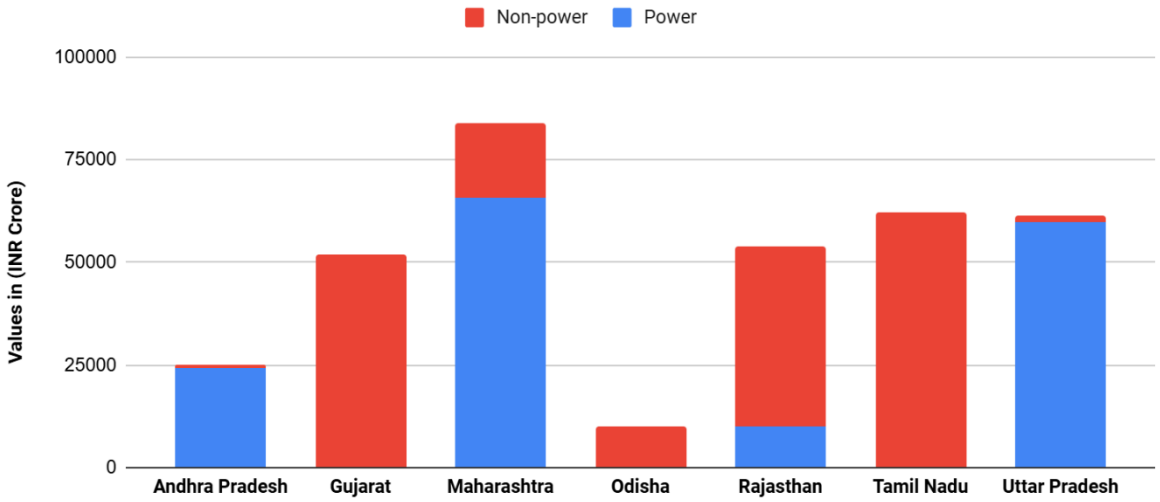


Figure 16: Power and Non-Power Subsidy for Green Hydrogen Production across 7 States Source: CEEW

Power-related components account for 92 per cent of the total potential support in Odisha, Uttar Pradesh, Maharashtra, and Andhra Pradesh combined. However, Gujarat and Tamil Nadu do not have dedicated green hydrogen policies. These states provide support through their industrial policies respectively, offering only non-power-related support for green hydrogen. Further, Rajasthan is the only state with a green hydrogen policy that provides more support for nonpower-related initiatives than for power-related

59 https://www.ceew.in/sites/default/files/ceew-assessing-financial-support-through-policies-in-india.pdf

ones, capitalising on its natural advantage and the existing installed RE capacity in the state.

Key Message: *Most states provide competitive incentives in energy policies, however, the corresponding investments differ.*

Gujarat is the first state to have developed India's Indigenously-Built 1 MW Green Hydrogen Plant. This is part of larger 10MW Green Hydrogen Plant in Bhuj. The electrolyzer used to produce the hydrogen is made in India, and initially it will power 11 buses and street lighting at Kandla port.
Source: Press India Bureau

2. Incentives for Electric Vehicles

For electric mobility, a total of six states[60] out of 10 considered in this report have integrated RE polices and four of them also deal with EV charging infrastructure. Jharkhand is the only state that provides incentives for charging infrastructure in solar policy. In other states, incentives on EV are available in specific EV polices. The following table shows incentive landscape vis-à-vis all 10 states.

Table 15: Incentive Landscape for Electric Vehicles as per Respective EV Policies

Incentive Theme	AP	AS	BR	GJ	JH	MH	OD	RJ	TN	UP
Demand-Side Incentives										
Purchase Subsidy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Road Tax & Registration Fee Exemption	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Scrapping Incentive	Yes	No	Yes	No	No	No	Yes	No	No	No
Charging Infrastructure Incentives										
Capital Subsidy for Charging Stations	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Special Electricity Tariff	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Land at Concessional Rate/Lease	Yes	No	Yes	No	No	No	Yes	Yes	No	Yes
Manufacturing Incentives										
Capital Subsidy/Investment Support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SGST & Stamp Duty Benefits	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes
Recycling & Reuse Incentives										
Policy/Incentives for Battery Recycling	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
R&D and Skill Development										
Support for R&D (e.g. CoE Grants)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Skill Development Programmes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes

As discussed in the previous section, bus transport remains a crucial area for mobility decarbonisation. Accordingly, the union government has identified public buses as a

60 AP, Assam, Bihar, Gujarat , Odisha, Rajasthan

priority segment because they account for a large share of passenger mobility, particularly in urban areas, yet operate under significant financial stress. To overcome cost barriers and viability risks, national schemes have been introduced to channel support through Convergence Energy Services Limited (CESL), the government's designated agency for aggregating demand, standardizing procurement, and managing contracts. Two flagship schemes now provide complementary routes for electrification.

PM e-Bus Sewa establishes a payment security mechanism to ensure stable and predictable revenues for State Transport Undertakings (STUs) and City Transport Undertakings (CTUs) that adopt electric buses. By de-risking cash flows for operators, it encourages private sector participation in supplying and operating e-buses under gross cost contracts. This addresses one of the most critical barriers to bus electrification i.e. the inability of transport corporations to provide financial guarantees.

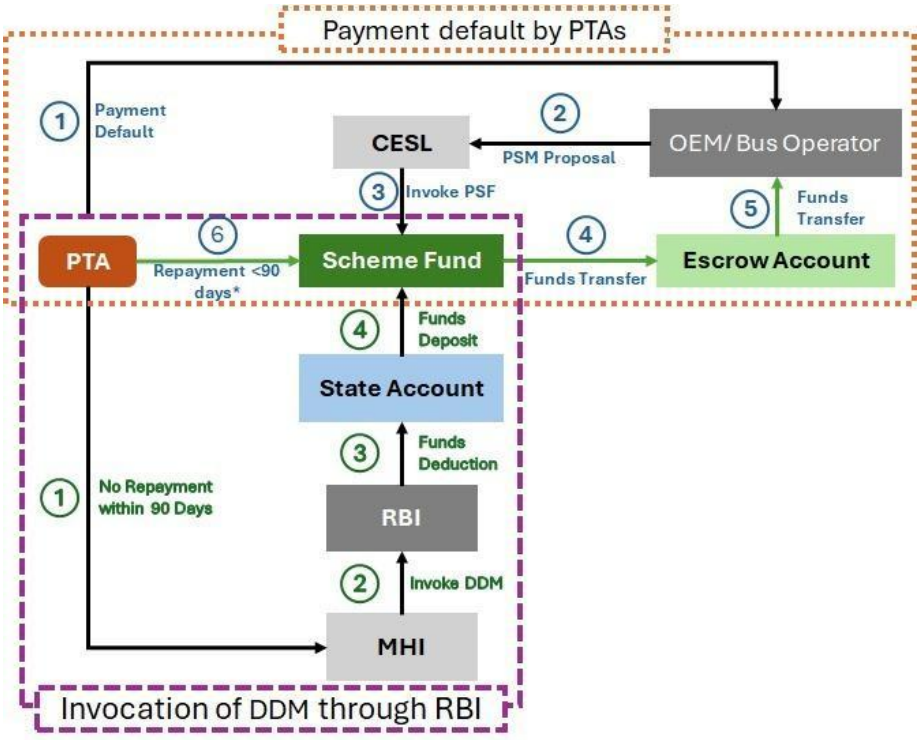


Figure 17: Payment Security Mechanism for Procurement of E-Buses; Source: Indicc

Another scheme namely PM E-DRIVE also extends demand incentives and capital support that STUs and CTUs can leverage. The scheme earmarks resources not just for vehicles but also for supporting infrastructure and institutional capacity. For public transport agencies, this means access to upfront subsidies for buses alongside funding for charging networks and testing facilities, thereby reducing both acquisition and operational challenges.

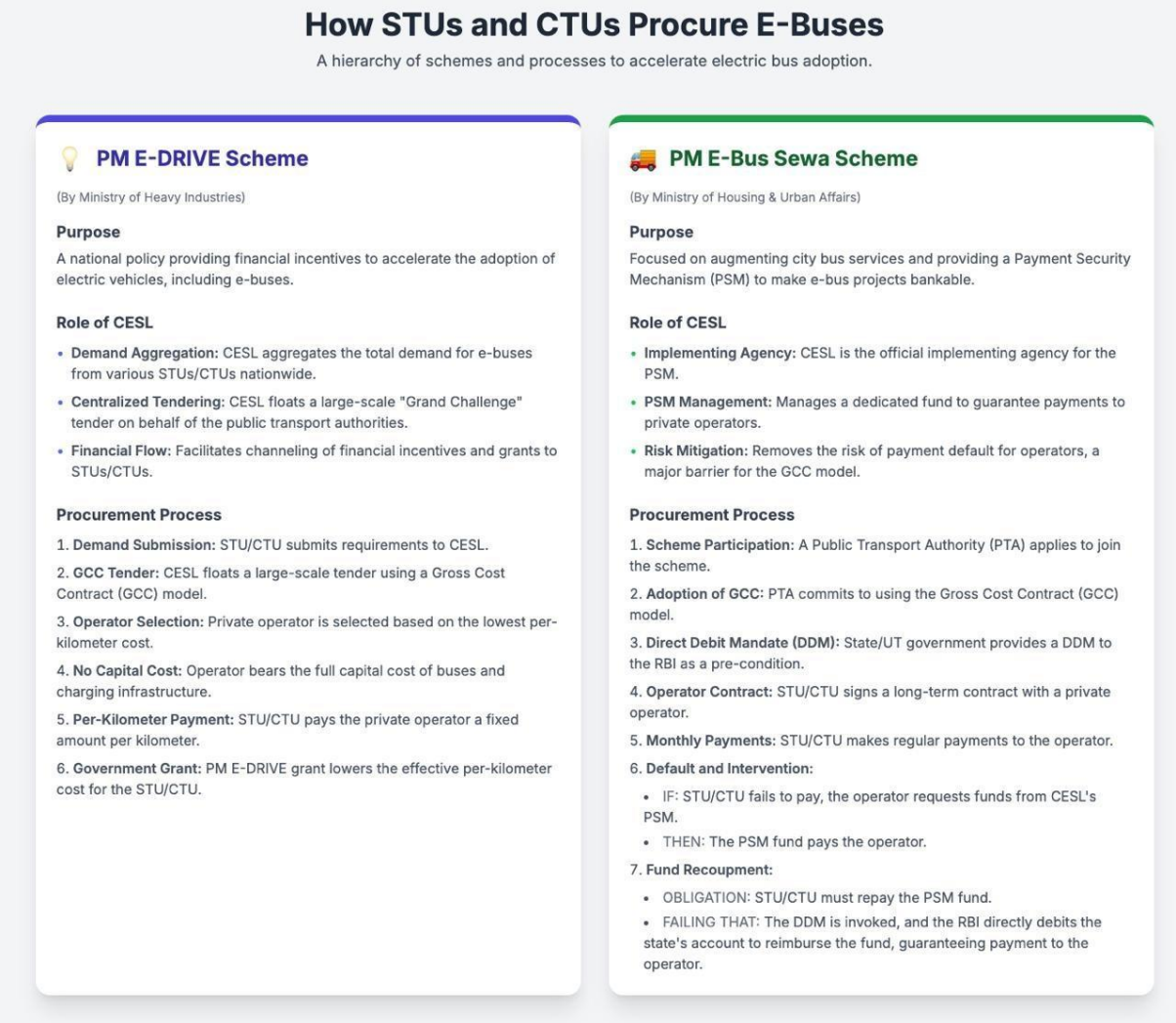


Figure 18: How STUs and CTUs Procure E-Buses; Source: Indicc

At the state level, governments are aligning their EV policies with these central schemes, often supplementing them with targeted incentives, concessions on electricity tariffs, and support for depot infrastructure. The interaction of central support (through CESL and national schemes) with state-level facilitation creates a two-tier ecosystem that enables large-scale bus electrification.

CESL serves as the critical bridge, translating national incentives into standardized contracts, pooling demand from multiple STUs and CTUs, and lowering procurement costs through economies of scale. For states, this arrangement reduces transaction complexity and allows them to focus on operational integration, route planning, and last-mile service delivery.

Similarly for other government vehicles Energy Efficiency Services Limited (EESL) acts as the government's central procurement arm for electric vehicles, aggregating demand from across departments and offering a cost-effective supply channel for states. It has also floated a tender for 10,000 electric vehicles, demonstrating its role in de-risking

procurement and giving manufacturers assured volumes. By bypassing fragmented procurement, EESL helps states replace aging fleets systematically and at scale.

Further, under PM E-DRIVE (2024–2026), a dedicated ₹7,171 crore allocation supports capital subsidies for electric buses, testing facilities, and charging infrastructure as well. Importantly, the programme targets the installation of 22,000 charging stations for four-wheelers and 1800 charging hubs for public e-buses. The Bureau of Energy Efficiency (BEE) serves as the central nodal agency, coordinating implementation with states and private operators.

Despite these national efforts, the challenge remains one of scale and distribution. As of the latest figures, India has 11,415 private charging stations and 14,833 public charging stations, with wide variations across states. To bridge this gap, state governments are deploying a mix of capital subsidies, land-use reforms, and public–private partnerships (PPPs) to accelerate rollout and address barriers such as high upfront costs and land availability.

Key Message: *Bus transport remains an underserved area despite central push and incentives*.

3. Urban Development Incentives

The momentum to get India's municipalities market ready is getting a fillip from India's Union Ministry of Housing & Urban Affairs (MoHUA) which provides a one-time monetary incentive of USD 1.5 Million for every USD 12 million of bond issuance. To further incentivise ULBs to mobilise climate finance, an incentive of USD 1.2 million for every USD 12 Million green bonds issued is also provided by the ministry.

Additionally, Urban Challenge Fund set up as per the Union Budget 2025-26 can also be leveraged by municipalities. This fund can be tapped to finance up to 25 per cent of the cost of bankable projects with a stipulation that at least 50 per cent of the cost is funded from bonds, bank loans and Public Private Partnership (PPP). The Pimpri Chinchwad Municipal Corporation (PCMC) in Maharashtra has leveraged the fund successfully which in effect has offset the interest component of PMC green bond issuance[61].

Further, AMRUT 2.0, launched in 2021, also aims at the Credit rating of Tier-2 cities (population 50,000 to 99,999) and enhancing the credit worthiness of AMRUT Urban Local Bodies (ULBs).

61 https://timesofindia.indiatimes.com/city/pune/pcmcs-200-crore-green-municipal-bonds-listed-on-bse-cm-and-deputies-attend-ceremony-in-mumbai/articleshow/121760939.cms

Similarly, Urban Local Bodies (ULBs) in India which exceed a total of 5000 in number[62] require substantive efforts to become market oriented. Recently, Union

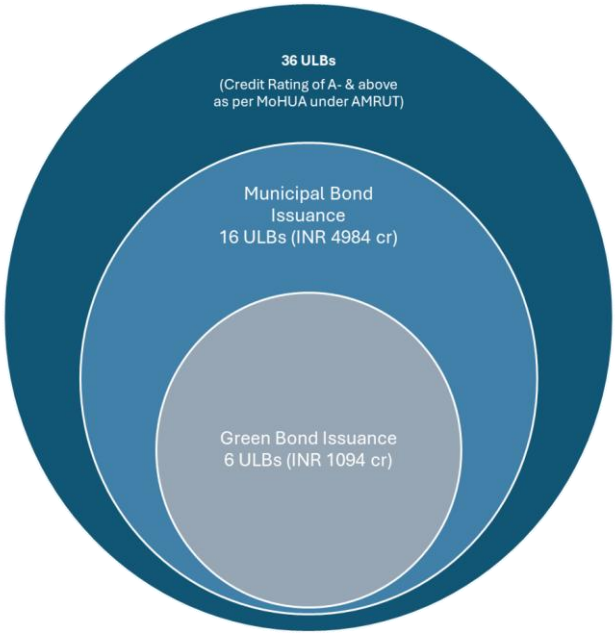


Figure 19: Readiness of Municipalities for Green Bonds Issuances in India; Source: Indicc

Ministry of Housing and Urban Affairs (MoHUA) undertook credit rating exercise for 468 ULBs nationwide out of which 162 have received Investible Grade Rating (IGR) i.e. rating B- and above, and 34 cities spread across 12 States/UTs received rating of A- and above.[63]

The XVI Finance Commission has also recommended an Urbanisation Premium of ₹10,000 crore as a one-time grant to States for merger of peri-urban villages into adjoining urban local body areas and for formulation of a Rural to Urban Transition Policy. This is important because a large part of India's urban growth is unfolding in transitional spaces that remain under-served in terms of governance and infrastructure. The support provision can therefore help states towards planned urban expansion and strengthen the institutional base for delivery of basic urban services in newly urbanising areas.[64]

With regards to raising finance from green bonds, as of 2026 only six municipal corporations of Ghaziabad (Uttar Pradesh), Indore (Madhya Pradesh), Ahmedabad (Gujarat), Vadodara (Gujarat), Pimpri-Chinchwad (Maharashtra) and Surat (Gujarat) have issued Green Bonds. Importantly, all municipalities with green bond issuances have had a successful track record of vanilla bond issuances in the past. Currently, there are ten other Urban Local Bodies (ULBs) which have issued vanilla municipal bonds which place them a step closer to the green bond market.

62 https://pmay-urban.gov.in/list-ulb.pdf
63https://www.pib.gov.in/PressReleasePage.aspx?PRID=2043167&reg=3&lang=2#:~:text=Under%20AMRUT%2C%20for%20enhancing%20credit,States%20by%20Department%20of%20Expenditure.
64 https://prsindia.org/policy/report-summaries/report-of-the-16th-finance-commission-for-2026-31

Given that municipalities are pivotal for urban development and several municipalities are either not market oriented or starved for funds, pooled financing offers an alternative model for smaller municipalities that lack the scale or creditworthiness to issue bonds independently. Under this approach, a public entity aggregates the borrowing needs of multiple ULBs into a single issuance, backed by a common fund and credit enhancements. From a credit standpoint, pooled financing mitigates individual municipality risk through portfolio diversification and centralized governance. It also enables the use of blended finance where concessional capital from multilateral agencies is layered with commercial debt-to improve affordability and sustainability.

Key Message: *Municipalities should be encouraged to become market oriented through better accounting hygiene. This may require a three-step process from raising loans to issuing vanilla bonds and thereafter graduate to issuing green bonds. From a credit standpoint, pooled financing mitigates individual municipality risk through portfolio diversification and centralized governance. It also enables the use of blended finance-where concessional capital from multilateral agencies is layered with commercial debt-to improve affordability and sustainability.*

The Tamil Nadu Urban Development Fund (TNUDF) and the Water and Sanitation Pooled Fund (WSPF) managed by Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL) have undertaken pooled approach and demonstrated its viability. The KfW-assisted Sustainable Municipal Infrastructure Financing Program combines loans and grants to support urban infrastructure and the WSPF has successfully raised a sum of ₹ 302 crores through 6 bond issues under pooled bond framework for implementation of various infrastructure projects.

4. Agriculture Incentives

Covered above in Chapter III

5. Sustainable Industrialization Incentives:

5.1 Environmental Sustainability Incentives

Key sustainable industrialisation initiatives and incentives in the ten states covered in this report can be broadly divided into three categories namely environmental sustainability, incentives that promote social equity and participation; and other ecosystem initiatives and incentives. (**Table 16)**

With respect to the first category, the incentives across states broadly designed to nudge industries to adopt higher share of renewable energy and lowering their carbon footprint while promoting circular economy. Incentives in this category also cover waste reduction in manufacturing and usage of common facilities. With regards to social incentives, emphasis is laid on employment generation, inclusion of marginalised sections, gender mainstreaming, representation of persons of disability in industrial activity, housing and

human safety. Finally, there are other ecosystem incentives where emphasis is laid on research & development, promoting industrialisation in less industrialised geographies and carbon credits amongst others.

Specific incentives are different across states but broadly capture an increasing momentum towards nudging industries to adopt sustainable practices. An indirect but interesting insight that can be gleaned from the nature of incentives is that sustainable industrialisation requires coordination amongst several departments. Moreover, tracking tax expenditures (government revenue losses from tax exclusions, exemptions, deductions, credits, deferrals, and preferential tax rates) for sustainability is not a straightforward proposition. Based on interaction with industry stakeholders during the research, at least in one state, it was found that awareness on policy provisions and incentives was quite low amongst industry stakeholders, particularly MSMEs.

From 2022-23, large companies which are in the top 1,000 listed entities in India by market capitalization are mandated to follow the Business Responsibility and Sustainability Reporting (BRSR) framework. This includes listed public sector undertakings (PSUs), banks, and insurance companies, with future extensions likely to include value chain partners. However, as per the Institute for Energy Economics and Financial Analysis (IEEFA) recent report[65], India's corporate sustainability reporting framework faces a fundamental misalignment with global investor expectations for credible climate transition planning. The report highlights that while the Business Responsibility and Sustainability Reporting (BRSR) framework demonstrates strengths in social and community engagement metrics, it critically lacks the climate-specific depth required for effective transition planning—missing mandatory scenario analysis, clear linkages between emissions targets and transition levers, and granular governance disclosures that capital providers increasingly demand.

Further, the IEEFA study also highlights that large, listed companies often find reporting under BRSR demanding and difficult to complying with. Further, BRSR was not designed with MSMEs in mind. Securities and Exchange Board of India (SEBI) has acknowledged this gap through the introduction of BRSR Lite, which is a simplified, voluntary ESG framework, designed as a pared-down version of BRSR. It requires fewer indicators across the nine National Guidelines on Responsible Business Conduct (NGRBC) principles introduced by Ministry of Corporate Affairs, Government of India. BRSR Lite is intended to draw smaller firms and value-chain partners into the fold of sustainability reporting.

In addition, Confederation of Indian Industries (CII) – an prominent industry chamber in India has also formulated GreenCo[66] rating system for MSMEs. Essentially, it is a voluntary rating system with incentive scheme recognised under the Investment Promotion Scheme for certain states such as Rajasthan. The framework's focus remains

65 https://ieefa.org/resources/corporate-climate-transition-planning-and-disclosures-india
66 https://greenco.in/rspcbgreenco.php

largely confined to environmental, energy and operational parameters, and does not directly address the social dimension — worker welfare, just transition, community resilience which are also integral to sustainable industrialisation.

Besides the above, India is also supporting the transition of MSMEs towards sustainable industrialisation through Small Industries Development Bank of India (SIDBI). This includes concessional green products such as the Green Finance Scheme, End to End Energy Efficiency (4E) Scheme, GIFT scheme, and the Partial Risk Sharing Facility which covers energy efficiency needs, renewable energy requirements, circular economy practices, water & waste management, and E- mobility[67].

Table 16: Key Sustainable Industrialisation Initiatives and Incentives in Ten States

State	Environmental Sustainability Initiatives
Andhra Pradesh	Shift towards renewable energy sources, promoting energy efficient equipment, utilizing low-carbon fuels, and implementing carbon capture methodologies. Aims to achieve 40 GW energy from renewable sources by 2030
	Capital subsidy provided for investment in circular economy, clean production, waste reduction, resource efficiency, green energy, and safety measures
	Promoting the principles of Recycle, Reuse, and Reduce (RRR). Supporting R&D in circular economy technologies
Assam	Tax reimbursement consideration for investments not less than Rs. 5 crores in green technology (like solar plants) that results in at least 40% replacement of conventional sources of energy. Generation of power through Green Technology is a thrust area.
	Subsidy of 50% on the capital cost for setting up effluent treatment plants
Bihar	Focus on rapid deployment of modular RE systems, including Solar Power, Biomass, Hydel Power, and Waste to Energy projects.
	Implementation of an online consent management system (CTE/CTO) and exemption from obtaining CTE/CTO for industries under the green category, resulting in inspection only once in five years.
	Developing a gas grid to ensure availability of natural gas as clean energy.
Gujarat	Developing the world's largest solar park (5 GW) at Dholera Special Investment Region (SIR) and promoting Green Energy (Solar & Wind Equipment) as a Sunrise Sector
	Manufacturing sector is driven by the core pillar of Zero Defect in Manufacturing and Zero Effect to Environment
	Promoting Waste management projects and manufacturing of Eco-friendly compostable materials as Sunrise Sectors. Helping for Common Environmental Infrastructure Facilities (CETP, Waste Management Systems)
	Incentivizing industries practicing at least 50% waste recovery through Zero Liquid Discharge (ZLD) with up to 50% capital subsidy. Aiding (up to 75% cost) for Energy & Water Conservation audits.
	Support for implementing cleaner production technology to reduce raw material substitution, energy/water consumption, or waste generation.

67 https://www.sidbi.in/head/uploads/other_loans_document/3.%20Financing%20Schemes%20for%20Sustainable%20Development.pdf

Jharkhand	Promoting a sustainable model focused on non-conventional energy sources like solar, wind, and biomass. Power plants generating power from renewable sources are eligible for 50% electricity duty exemption for 10 years.
	Financial assistance provided to JIADA for establishing common solid waste management facilities, common effluent treatment plants, and hazardous waste management facilities.
	Promoting rainwater harvesting and recycling of used water by industries.
	Comprehensive Project Investment Subsidy (CPIS) calculation includes weighted investment in Pollution Control Equipment and Environment friendly alternative power generation equipment.
Maharashtra	Encouraging captive renewable power generation projects. A captive solar power plant is considered part of Eligible Fixed Capital Investment (FCI) if at least 80% of generated power is utilized by the unit annually.
	Assistance for measures aimed at conserving water, energy, and environment, supporting waste management systems (ETP, STP), pollution control systems/devices, and water conservation/harvesting systems/devices.
	Green Energy/ Bio Fuel Production is defined as a thrust sector to address carbon emissions and reduce reliance on oil imports
Rajasthan	Assistance for financial institutions/SPVs for the establishment of Common Effluent Treatment Plant (CETP) and/or Zero Liquid Discharge (ZLD) and effluent/treated water networks
	Industries are encouraged to use treated water/recycled water instead of fresh water.
	50% reimbursement for Environmental Infrastructure (ETP, ZLD, pollution, water)
	Adoption of Water/Energy conservation practices and methodologies encouraged. Rain Water Harvesting encouraged with government support.
Tamil Nadu	Provides a 25% subsidy (max. Rs. 1 cr.) for projects undertaking green initiatives for recycling waste and water and sustainable energy usage.
	Undertaking initiatives towards sustainability of industrial water, including desalination plants and recycling of water for industry reuse.
	Incentivizing Zero Liquid Discharge (ZLD) Solutions, smart water solutions, rainwater harvesting, green buildings (IGBC/LEED/GRIHA Certification), and installation of Pollution Control Devices (PCD)
	New or expansion manufacturing projects receive electricity tax exemption for a period of 5 years on purchased or captive-generated power
Uttar Pradesh	Incentivizing various activities related to circular economy: Shredding units (auto parts), manufacturing of bio-fuel/bio-diesel, recycling of plastic waste, waste-to-energy processing, and E-Waste Management units/facilities/parks.
	Incentivizing investment in installation plants for purification of water and for pollution control measures (effluent/emission, hazardous waste disposal) as eligible capital investment.
	Encouraging Reverse logistics for retrieval of parts, recycling of products, and disposal of packaging waste to support the circular economy

5.2. Social Sustainability Incentives

State	Social Sustainability Initiatives
Andhra Pradesh	Incentivizes projects showing a higher Direct employment to investment ratio.

	Encouraging responsible actions towards human safety, which is covered under the scope of the de-carbonization subsidy.
Assam	Units must employ a minimum of 80% people of Assam in the Managerial Cadre and a minimum of 90% in the Non-Managerial Cadre
	One-time incentive of Rs. 10,000 to the employer for each local youth employed
Bihar	Providing relatively more economic benefits to priority sections such as SC/ST, women, differently abled, war widows, acid attack victims and third gender entrepreneurs.
	Increasing the maximum limit of all incentives (except for land) by an additional 15% for entrepreneurs from marginalized groups.
Gujarat	Providing an additional 1% interest subsidy to SC/ST entrepreneurs, physically challenged entrepreneurs, and Women entrepreneurs in the manufacturing sector
	Special incentives are provided for the construction of Dormitory housing for laborers in industrial clusters to ensure better living conditions
	Continuation of the specialized scheme "Bharatratna Dr. Babasaheb Ambedkar Udyog Uday Yojna for SC/ST Entrepreneurs of MSMEs" with increased incentives
Jharkhand	Aims to ensure balanced regional development by providing equal opportunity for vulnerable groups, particularly women, SC and ST.
	Providing an additional 5% Capital Subsidy for SC/ST, Women, and Differently abled Entrepreneurs.
	Planning to establish an exclusive Industrial Park for Women Entrepreneurs.
Maharashtra	Reserving land in new MIDC industrial estates for SC/ST entrepreneurs (20%) and women entrepreneurs (5%)
	Walk to Work Concept: Encouraging companies to develop accommodation facilities for employees within 5 km radius of the work area to decongest cities and improve work-life balance.
Rajasthan	Special schemes for financial assistance to entrepreneurs belonging to SC, ST, women entrepreneurs, cottage industries, street vendors and Self Help Group (SHG)
Tamil Nadu	Providing a higher training subsidy (Rs. 6000 per worker/month) for women and transgender employees, persons with benchmarked disabilities, and persons from SC/ST communities (compared to Rs. 4000/month for general residents
	Employment for persons with benchmarked disabilities gets double weightage for employment-based incentives
	Industrial Housing/Walk-to-Work: Encouraging projects to develop accommodation and hostel facilities for employees within a 5 km radius of the work area. Industrial Park developers are eligible for an Industrial Housing Incentive.
Uttar Pradesh	Emphasis on job creation, focusing on sectors with high employment potential and promoting self-employment for local artisans through flagship programs like ODOP and Vishwakarma Shram Yojana
	Capital subsidy provided for building Hostel/Dormitory Housing in Private Industrial Parks

5.3. Other ecosystem initiatives and incentives

State	Economic and Governance Sustainability Initiatives
Andhra Pradesh	Providing support and incentives to enterprises seeking globally recognized quality certifications and aiming to meet emission reduction norms

Assam	Providing subsidy (up to 75%) for obtaining BIS/ISO/FSSAI/ZED Certification and fee payable for technical knowhow/Technology transfer.
Bihar	Giving incentive preference to low energy and non-polluting industries
Gujarat	Promoting quality certifications under the ZED scheme to enhance manufacturing quality and global competitiveness
	Financial support for filing domestic and international patents (up to 75% of cost, max. INR 25 lakhs). Providing support for Research & Product Development centers.
Jharkhand	Financial assistance (50% up to Rs 10 lakh) for Patent Registration and Quality Certification. Reimbursement available for certifications including ISO-14000 Environmental Management System and Green Energy Certificate
	Promoting carbon credit mechanism/trading by identifying a nodal agency to provide support.
Maharashtra	Providing special fiscal incentives to industrial units in under-developed regions (Vidarbha, Marathwada, etc.) to promote balanced growth
	Providing standalone incentives for Research & Development, technology up-gradation, and cleaner production measures.
Rajasthan	Assistance to MSMEs for technology acquisition/upgradation, quality certification, R&D, branding & promotion and Intellectual Property Rights (IPR)
	Through the iStart Rajasthan program, the state has catalyzed climate-tech entrepreneurship—offering funding, mentorship, and incubation for solar, water-management, and clean-tech startups.
Tamil Nadu	Creation of an Industrial Ecosystem Fund (corpus of Rs. 500 cr.) to support small infrastructure projects and ecosystem creation, such as innovation centres or research parks
	Classification of districts into "C" Category (22 districts) expanded to promote industrial dispersion in low-industrialization areas
	Subsidy for Intellectual Property Creation (patent, copyright, trademark, GI registration) and Enhanced incentives for Quality Certification (ISO, BIS, etc.) up to Rs. 1 crore.
Uttar Pradesh	Financial support for standalone R&D units (25% of expenditure up to ₹10 Crore). Reimbursement (50% up to ₹1 Crore) for registration of intellectual property rights
	Graded incentive structure for balanced regional growth

Key Message: *While extremely important, sustainable industrialisation represents a complex universe due to difficulty in reporting; mandated and voluntary reporting standards; fundamental misalignment with global investor expectations for credible climate transition planning due to varied depth of disclosures; alignment of state incentives with reporting requirements and cumbersome tracking of outcomes against tax expenditures et al. Particularly, with respect to MSMEs there is also a need for uniformity between BRSR lite and Industry led standards like GreenCo.*

6 Readiness of Public Sector Enterprises (PSE's) and Municipalities

As much of the green infrastructure will have to be made at the state and sub-state level, state level Public Sector Enterprises (PSEs) and municipalities have a significant role in executing and financing green projects. To meet the financing requirement for green infrastructure, these entities will need to borrow from the market to scale up their green activities/projects. Assessment of their market orientation is therefore necessary. A snap assessment reveals that several PSEs and municipalities in three key sectors namely Power, Transport and Urban Development in the ten states considered in this report, are not yet market oriented i.e. most of them have subpar rating or no rating at all rendering them unable to access market borrowing on favourable cost of capital. However, notable exceptions can be seen in states like Gujarat and Maharashtra. Lack of market orientation also limits the ability of many entities to leverage partial credit enhancement facilities provided by financial institutions.

Table 17: Snap Assessment of Power, Transport and Urban Development in Ten States

States	Power		Transport		Urban Development		
	Total PSEs	Credit Rated PSEs (Long-Term)	Total PSEs	Credit Rated PSEs (Long-Term)	Total PSEs	Credit Rated PSEs (Long-Term)	Credit Rated ULBs (Long-Term)
Andhra Pradesh	9	6	2	1	5		31 (2) *
Assam	7	2	2		1		4(1) *
Bihar	8	0	2		4		27
Gujarat	12	10(10) *	2		4		12(3) *
Jharkhand	6	1(1) *	3		2		9
Maharashtra	7	5(5) *	6	1(1) *	8	1(1) *	42 (9) *
Odisha	8	5(4) *	4		2		8
Rajasthan	19	11(6) *	4	1	6		28(3) *
Tamil Nadu	4	2(2) *	11	2	2		27
Uttar Pradesh	12	3(3) *	3		2		59 (2) *

The above table shows number of state PSUs in the respective sector (as per CAG Finance Account 2023-24), and their credit ratings (last available). All the credit rated PSUs mentioned have a rating of BBB- and above. Number of PSUs having ratings better than A are mentioned in the brackets and marked with star. The ratings for ULBs follow the same schema.

Some PSEs however follow the route of Joint Ventures (JVs) which allows them to leverage the balance sheet strength, technical credibility and procurement capacity of JV partner. Such examples include NTPC Green and MahaGENCO; APGenco and SECI; APGENCO and National Hydro Power Corporation (NHPC), Assam Power Distribution Company Limited (APDCL) and ONGC-Tripura Power Company (OTPC); National Thermal Power Corporation (NTPC) Rajasthan Green Energy Limited (between NTPC and RVUNL); OIL-Rajasthan Akshaya Urja Limited; the IGL JV with Rajasthan Rajya Vidyut

Utpadan Nigam Limited (RVUNL) and Rajasthan Power Grid Transmission Company Limited, among others.

While the JV route can be observed as a rising trend in several states, it does not undermine the need for PSEs and municipalities to improve their credit rating particularly considering the large requirement of infrastructure development and service delivery in India.

Key Message: *Market readiness of PSEs and ULBs is critical to meet green infrastructure requirement for India and for the delivery efficient public services*.

CHAPTER V

GLEANING SENSE FROM FLOW OF CONCESSIONAL FINANCE AND FINANCE FROM DEVELOPMENT FINANCE INSTITUTIONS (DFI)

1. Concessional Finance from MDBs and BFIs

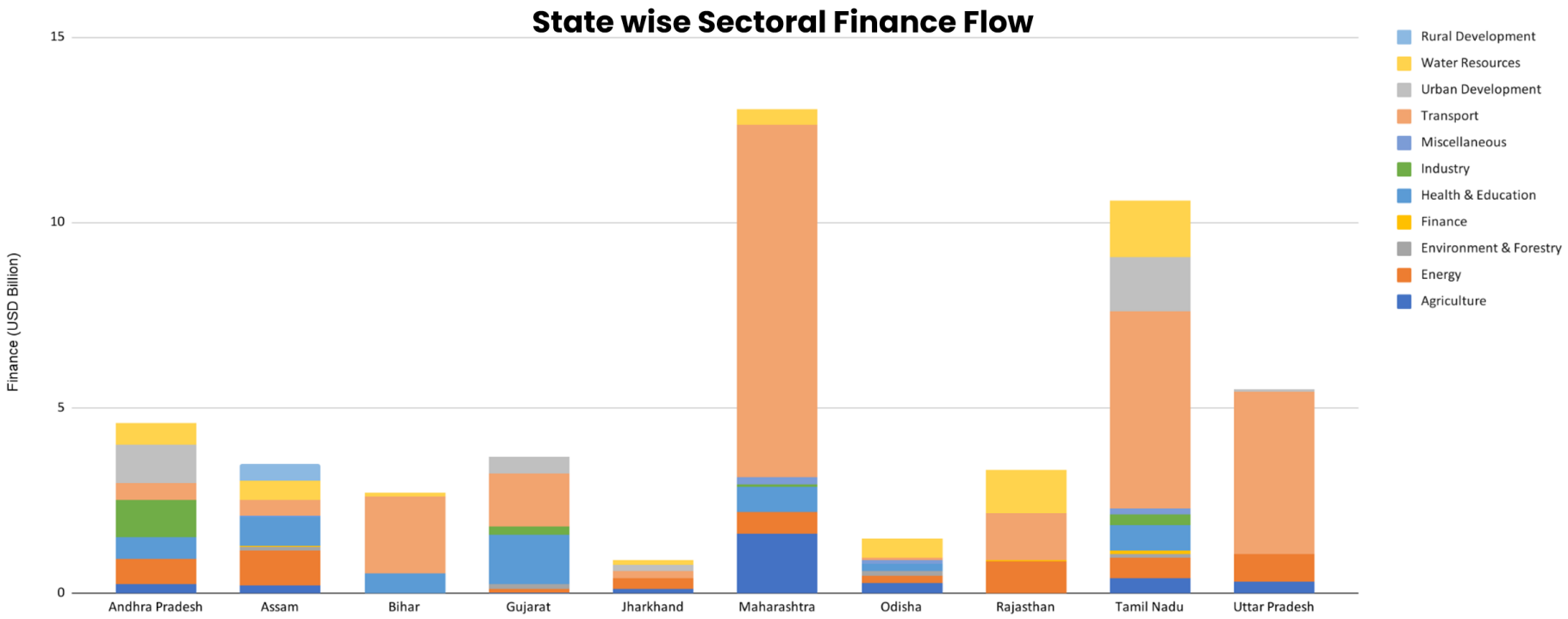
As concessional finance from MDBs/BFIs have played an important role towards de-risking projects and ensuring bankability, their role in green projects is critical. An overall assessment of concessional finance (green and non-green) in the past 10 years (2015-2025) from seven MDBs/BFI[68] throws interesting insights. First, a significant amount of concessional finance has seen an allocation to the transport sector and within the transport sector significant allocation has been to metro rail followed by roads and highways. Public transport, other than metro attracted the least amount of concessional finance. This reinforces the argument made earlier in this report that public transport, particularly the bus transport, deserves special attention.

Energy and water resources come a distant second while urban development garners the least out of all categories. This is not surprising given a very limited capacity of municipalities to execute urban development projects. This insight reinforces that special attention needs to be provided to municipalities as they are primarily responsible for urban development.

The assessment also shows a great disparity in states and their ability to attract concessional finance. Maharashtra, Tamil Nadu and Uttar Pradesh are the top three states where concessional finance to attract concessional finance. On the other hand, Andhra Pradesh and Assam show most diversified and relatively proportionate utilisation on concessional finance. Specific causality for this trend is difficult to extrapolate from the data. However, it can be assumed that states with very high economic activity such as Maharashtra and Tamil Nadu have relatively more fluid project pipelines and more borrowing room.

Key Message: *Concessional finance is highly skewed across states and sectors. This may have to do with project pipelines, availability of fiscal room, cash flows and debt servicing amongst other things.*

68 Japan International Cooperation Agency (JICA) | European Investment Bank (EIB) | Kreditanstalt für Wiederaufbau Development Bank (KfW) | Agence Française de Développement (AFD) | Asian Infrastructure Investment Bank (AIIB) | World Bank (WB) | Asian Development Bank (ADB)



Agriculture : USD 3235.07	
Agro Business	35.2%
Agro Industry	3.1%
Agro Value Chain	2.0%
Irrigation	24.9%
Natural Resource Management	1.3%
Rural Market Infrastructure	33.6%

Industry: USD 1575.26	
Energy efficiency	4.0%
Environment Management	3.7%
Industrial Corridor Development	68.9%
Regional Development	16.8%
Rural Enterprise Ecosystem Development	6.7%

Urban Development: USD 3175	
Climate Resilient Urban Development	51.5%
Housing	13.9%
Municipal Finance	17.3%
Tourism	2.2%
Water & Sanitation	15.1%

Transport: USD 25094.45	
Metro Rail	57.5%
Public Transport	1.0%
Railways	7.0%
Roads & Highways	34.5%

Energy : USD 4950.55	
Power Distribution	46.5%
Power Generation	25.2%
Power Transmission	28.4%

1. Pertains to state level allocation for the **10 states** - **Andhra Pradesh, Assam, Bihar, Gujarat, Jharkhand, Maharashtra, Odisha, Rajasthan, Tamil Nadu** and **Uttar Pradesh**.
2. Timeframe: **2015-2025**
3. Country-level data has not been captured in the state-level allocations

Figure 20: State Wise Sectoral MDB/BFI Finance Flow; Source: Indicc

2. The role of Development Finance Institutions (DFIs) and Public Finance Institutions (PFIs)

DFIs and PFIs have had a long history in catalysing growth in India. As India faces a huge gap in climate finance requirements, their role assumes a special focus towards ushering a market for green projects in India. Some of the key DFI/PFIs in India include Power Finance Corporation (PFC), Rural Electrification Corporation (REC), National Bank For Agriculture And Rural Development (NABARD), Small Industries Development Bank of India (SIDBI), National Housing Bank (NHB), Housing and Urban Development Corporation Limited (HUDCO), Indian Renewable Energy Development Agency Limited (IREDA) and National Bank for Financing Infrastructure and Development (NABFID). While most of them have a multi-sectoral focus with top credit ratings, the quantum of asset under management differs substantially, indicating a vast opportunity to finance green growth of Indian states.

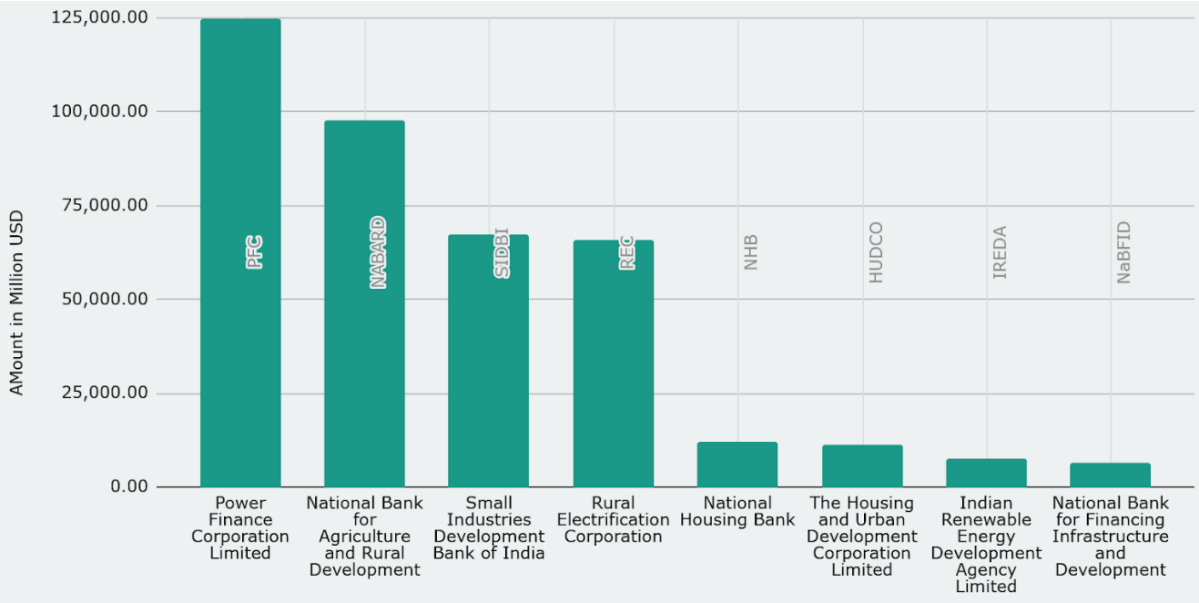


Figure 21: Asset Under Management (AUM) for Key DFIs; Source: Public Development Banks (PDBs) and Development Finance Institutions (DFIs); Source: AfD & Peking University

With the eventual merger of PFC and REC whose functions greatly overlap[69], it is expected that energy sector financing will get further fillip. This merger will create the largest government-owned NBFC in India with a combined loan book of approximately INR 17.3 lakh crore. For climate finance purposes, the merged entity's pricing power in international debt markets can position it as the dominant domestic counterparty for utility-scale renewable energy and grid investment at the state level.

However, assets under management of some other DFIs like NHB, HUDCO and NaBFID also need to scale up considerably given urgent the requirement in areas like housing

69 https://economictimes.indiatimes.com/industry/energy/power/pfc-names-consultants-for-merger-with-rec/articleshow/129761646.cms?from=mdr

and urban development. Furthermore, the Gujarat International Finance Tec-City (GIFT) - International Financial Services Centre (IFSC), regulated by the International Financial Services Centers Authority (IFSCA), has emerged as another channel for mobilizing offshore green and sustainability-linked capital.

Cumulative ESG-labelled debt listings on IFSC exchanges reached USD 15.73 billion as of September 2025.[70] IFSCA also issued a dedicated Framework for Transition Bonds in July 2025, opening a specific instrument class for hard-to-abate sector.[71] The state-level relevance is indirect but material. GIFT IFSC is increasingly the preferred listing venue for Indian corporates and NBFCs seeking offshore green debt, and its capacity to channel international private climate capital into Indian climate-aligned projects at the state level.

Key Message: *DFIs/PFIs have a development and public objective to achieve as Development Finance Institutions. Their optimisation is contingent upon attractiveness of projects, tightly packed project pipelines and credit rating of entities that they support. Further, DFIs financial products need to be better communicated to state governments and transaction advisors/project developers.*

70 https://taxguru.in/finance/ifsc-regulator-proposes-framework-sustainable-deposits-lending.html
71 https://www.taxmann.com/post/blog/ifsca-unveils-framework-for-esg-labelled-transition-bonds

CHAPTER VI

NEED FOR INTEGRATED TRANSITION PLANS AT THE STATE LEVEL AND INSTITUTIONAL DESIGN

Previous chapters examined the landscape of climate finance instruments available to states; sector-specific opportunities enshrined in policy targets; readiness from the perspective of policy incentives and market orientation of public sector enterprises/municipalities; and the flow of concessional and DFI finance at the state level. For an optimal flow of finance, amongst other things it is important that a well thought out transition plan exists at the state level. This chapter therefore turns to the state of transition planning at the state level.

In the private sector, transition planning has gathered momentum with deadlines much shorter compared to India's net zero target by 2070. State governments and state corporations too are demonstrating contours of such plans yet no state from amongst the 10 states considered in this report exhibit an integrated transition plan which would essentially entail localisation of NDCs at the state level, department level transition plans, transition plans at the level of PSE's and transition plans at the level of municipalities.

Before, this report highlights insights from states, it is important to list out key elements of transition plan. Amongst other things, transition plans need to be based on following aspects.[72]

- Nationally determined contributions (NDCs) are the main route by which countries and subnational governments can frame their climate priorities
- Long term commitments and targets are ideally broken down in shorter time frames
- Enabling sectoral policies should accompany as most emissions may lie outside the direct control of governments. Creating an enabling policy environment is crucial to unlocking private capital to support the financing of the transition
- Sectoral policies/targets are aligned to NDCs
- Prioritization of sectors and activities from emission perspective will further enable action
- Financing targets and ideally information on financing modalities should be identified to the extent possible
- Green budgeting is a lynchpin for transition policy
- Governance and administration focussing on Institutional design and delivery are a must

In the context of the above, it is pertinent to assess the readiness of 10 states considered in this report on transition planning. This is discussed below in brief. For the ease of reading some of the above parameters are clubbed together

72 https://etpi.in/indicator_results/c1-comprehensive-state-level-low-carbon-development-strategy

1. State Level Contributions in Alignment with NDCs

Among the ten states, Gujarat is the only state that demonstrates the most fundamental approach towards a transition plan. The state has mapped state level targets corresponding to India's Nationally Determined Contribution (NDCs) and has set targets for green activities up to 2030 over the 2023 baseline while identifying 'factor of change' in percentage terms for each activity. However, the state has not identified corresponding finance requirement for identified activities.

Ideally such an approach should be further localised within the mandate of respective state department, public sector enterprise and municipal corporation. Incidentally, this research has not delved into those details.

Sr. No	Panchamrit for Gujarat
GP1	120 GW non-fossil energy capacity by 2030
GP2	55% of energy requirements from renewable energy by 2030
GP3	Reduction of total projected carbon emissions from 2022 to 2030 by 145 million tons
GP4	Reducing the carbon intensity of the state's economy to 60% below 2005 level
GP5	Achieve Net65 by 2030

Figure 22: Gujarat's Panchamrit (GP1 to GP5); Source: White Paper on Implementation of Panchamrit in Gujarat

Sr. No	Indicators	Baseline (FY22-23)	Target (FY29-30)	*Factor of change*
1.	RE share in state's total requirement	23%	**55%**	*+32%*
2.	State's total energy requirement (BU)	139	**302**	*217%*
3.	State's total RE requirement (BU)	32	**166**	*518%*
4.	RE Requirement by utility (BU)	22	**98**	*445%*
5.	RE Requirement – Captive/OA/ rooftop (BU)	10	**68**	*680%*
6.	Renewable Energy Installed capacity (GW)	20	**120**	*+100*
7.	Export of RE outside Gujarat (GW)	3	**38**	*+35*
8.	Solar (GW)	9	**71**	*+62*
9.	Wind Onshore (GW)	10	**37**	*+27*
10.	Wind Offshore (GW)	-	**5**	*+5*
11.	Bio Energy (GW)	0.11	**1.0**	*+0.89*
12.	Hydro Pumped Storage Projects (GWh)	-	**4,800**	*+4,800*
13.	Battery energy storage (GWh)	-	**4,200**	*+4,200*
14.	Reduction in carbon intensity of economy vis 2005	-36%*	**-60%**	*-24%*
15.	GSDP's emission intensity ($kgCO_2e$/ Rs. Lakh)	2,426*	**1,563**	*-36%*
16.	GDP (real terms) of Gujarat (Rs. '000 Cr.)	1,183*	**2,061**	*174%*
17.	Net emission ($MtCO_2e$)	287*	**322**	*112%*
18.	Net Emissions from Power sector ($MtCO_2e$)	94*	**136**	*145%*

18.	Net Emissions from Power sector ($MtCO_2e$)	94*	**136**	*145%*
19.	Net Emissions from Transport sector ($MtCO_2e$)	22*	**32**	*145%*
20.	Net Emissions from Industries ($MtCO_2e$)	101*	**138**	*137%*
21.	Offsets from forestry ($MtCO_2e$)	(5)*	**(166)**	*-161*
22.	Offsets from CCUS ($MtCO_2e$)	-	**(7)**	*-7*
23.	Gross emissions ($MtCO_2e$)	292*	**496**	*169%*
24.	Net emission% (Net x)?	Net98*	**Net65**	*-33%*

* Refers to 2018 baseline

Figure 23: Key indicators baseline, targets and factor of change to achieve all Panchamrit; Source: White Paper on Implementation of Panchamrit in Gujarat State

Key Message: *Even though Gujarat has localised NDCs at the state level and has identified specific transition intensity across sectors, corresponding finance requirements are not identified.*

2. Can policy targets be reverse engineered to arrive at State level contributions in alignment with NDCs?

Sub-national climate commitments are well-established internationally. Brazil's states submit Nationally Determined Contributions through the Consortium of Governors for the Climate, in alignment with Brazil's federal NDC. US state-level commitments under the US Climate Alliance retain a form of NDC coherence despite federal withdrawal from the Paris Agreement. Canadian provinces submit provincial low-carbon pathway plans that aggregate to the federal commitment. The common feature across these cases is a standardised template that allows provincial commitments to be aggregated without reconciliation loss.

In India, State Action Plans on Climate Change (SAPCCs), initiated under the National Action Plan on Climate Change, are notified across states but were designed before India's NDC commitments were quantified and are therefore not structured for NDC-alignment aggregation. A usable state-level NDC template would require a common base year harmonised to the national NDC; target categories aligned one-to-one with NDC categories; sectoral output metrics defined identically across states and respective departments.

In the absence of the above, another possible way of arriving at state determined local contribution is through reverse engineering policy targets across sectors. However, as these targets are not always defined in specific terms over a specific time frame, it is not possible to fully reverse engineer them to arrive at state determined contributions to India's NDC. Further, there may be efforts by the state governments that go beyond stated policy pronouncements.

Table 18: Qualitative insights of State level policy targets

Policy Type	Insights for 2030 horizon (Note: Targets for states are for different time horizon for most states)
Energy	
Generation	Targets available for 8 out of 10 states over different policy horizons
Grid Infrastructure	GEC targets available for six out of 10 states as other states are not covered
Storage	Targets available for 8 out 10 states in GW and GWh units for PSP/BESS
Green Hydrogen	Targets available for 7 out of 10 states
EV Charging	Specific targets are not defined in any state
Clean Tech Manufacturing	Only 4 states have some sort of targets on solar, wind, battery, EV etc
Mobility	
STU/CTU Buses	Targets are defined for 9 out 10 states but in some case specific numbers are highlighted while in others they are defined in percentage terms
Government Fleet	Targets not defined but 5 out of 10 states indicate intent of switching to EV for government vehicles
Urban Development	
	Specific targets not defined
Sustainable Agriculture	
Organic and Natural farming	Specific targets are not defined
Sustainable Industrialization	
	Targets are not defined

***Key Message**: Reverse Engineering local contributions in alignment with India's NDCs using sectoral policy targets is not possible due to different metrics and timelines. This prevents an assessment of the quantum of financing required across different sectors.*

3. Financing Targets, Information on Financing Modalities and Green Budget

Of the 10 states considered in this report only 2 states namely Maharashtra and Uttar Pradesh have identified financing requirements to a certain extent even though all states have policies across key sectors as is shown in previous sections.

In Maharashtra, under Maharashtra Institution for Transformation (MITRA) seven districts have created detailed roadmaps for specific interventions required for a 5-year period along with identification of targets, cumulative costs, SDG linkage and state support desired. Even though these districts roadmap are not particularly created for climate action, sectors from climate finance perspective include fisheries, transport other than railways, tourism, real estate, logistics, textile, renewable energy, electric vehicles, agriculture, forest and green buildings, amongst others.

Sub Sector	Objective	Specific Interventions Required	Ease of Implementation	Physical Targets for 5 years	Cumulative Cost	State level support desired	Employment Potential	Linkage with SDGs
Fisheries	To increase value by retaining the quality and freshness of fish (As proposed by the Fisheries Department)	Increase the fleet of refrigerated and insulated vans under PMMSY Funding Pattern under Centrally Sponsored Scheme (CSS) (Centre:**State**: Beneficiary) (36:**24**:40)% SC/ST/Women (24:**16**:60)% General	2	75 (15 refrigerated vehicles annually) 400(80 insulated vans annually)	18.75 crores approx. (25 lakhs per van as per PMMSY Scheme) 80 crores approx. (20 lakhs per vehicle as per PMMSY Scheme)	**4.5 crore** **19.2 crore** (Assuming the higher value of contribution (24%))	1200-1500 (Assuming 3 persons per van)	Goal 8
	Promote sustainable and responsible fishing (As proposed by Maharashtra Fisheries Development Corporation)	1. To disseminate information about various fisheries-related schemes and programs through awareness and skilling programs to train youth. 2. To promote commercial utilization of fish wastage by preparing organic manure like fish silage. 3. To promote convergence between fisheries and allied sectors	2	Conduct quarterly physical training and awareness program 2000 (400 participants per year) (Three One-day training and a 3-day training under PMMSY annually. Target of 100 participants per training)	16 Lakhs approx. (Approx. Rs. 25000 for one-day training and approx. Rs. 80000 for nonresidential annual 3-day workshop for a batch of 50 participants under PMMSY) 5(25,000x3 +80,000x1)= 7.75lakh for batch of 50 ~16 lakhs for a batch of 100	This is a Centre Sector Scheme under PMMSY and has 100% funding. State to bear additional funds to those sanctioned under PMMSY scheme	Approx. 2000	Goal 1,12,14

Figure 24: Example of financing requirement under Five Year Action Plan for a district for Fisheries. Similar requirements are identified for other sectors.

Uttar Pradesh has identified a cumulative cost until 2030 for green activities in the State Action plan on Climate Change (2021-30). The cumulative requirement stands at Rs 1,12,204 Crores across nine missions.

Missions	No. of Strategies	No. of Actions	Financial Requirement for 2021–2030 (₹ in Crore)	Budget Available (₹ in Crore)	Budget Deficit (₹ in Crore)
Sustainable Agriculture Mission	5	19	29,797.73	22,980.01	6,817.72
Jal Mission	5	25	64,170.13	47,300.44	16,896.68
Sustainable Habitat Mission	9	35	8,326.75	6,008.80	2,317.95
Green UP Mission	5	20	6,292.68	3,427.71	2,864.97
Energy Efficiency and Green Energy Mission	6	37	3,127.55	1,053.76	2,073.79
Human Health Mission	5	31	171.50	171.50	0.00
Disaster Management Mission	2	10	305.70	38.70	267.00
Strategic Knowledge Mission	4	10	12.75	0.00	12.75
TOTAL (₹ in Crore)	41	187	1,12,204.79	80,980.92	31,304.86

Figure 25: Summary of Mission-Wise Fund Requirement for the Period 2022-2030. Available Budget from Existing State and Central Programmes and Deficit; Source: UTTAR PRADESH STATE ACTION PLAN ON CLIMATE CHANGE 2021–2030

As for the Green Budgets, they are lynchpin of transition policy. Out of the 10 states considered in the report four states namely Rajasthan, Bihar, Assam and Odisha have institutionalised green budgets, however, when green activities under three of the state 'green' budgets (Rajasthan, Bihar and Assam) were compared (at a high level) against sector specific criteria available under Climate Bonds Initiative Taxonomy, it was found that there remains a significant scope to align state level activities with internationally recognized standards.

The screening of Bihar's Green Budget against the Climate Bonds Initiative's (CBI) sectoral criterion found that 53% of the budget allocation was aligned with the established criteria. Furthermore, out of the 376 listed budget items, 241 items were found to be aligned. The total Green Budget for FY 2025, which represents 4.92% of the state's total budget, amounts to ₹20,395.28 Crore. The aligned portion is led by Natural Capital, with the allocation of ₹5,830.34 Crore (28.6% of the budget), highlights the state's priority for nature-based solutions and ecosystem preservation. Energy (7.1%) and Waste (4.3%), receive moderate commitments. The minimal allocations to Transport (0.5%) and Building (2.7%) also suggest a need to scale up funding for green infrastructure and low-carbon mobility to achieve comprehensive climate resilience.

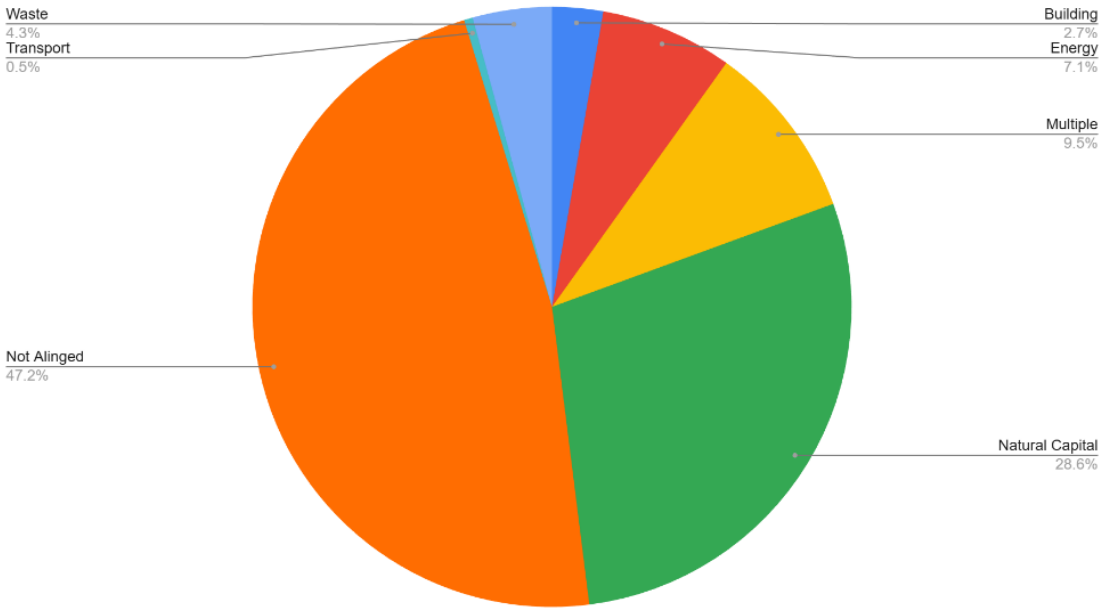


Figure 26: High Level Assessment of Bihar's Green Budget with Climate Bonds Initiative Taxonomy; Source: Indicc

For Assam Green Budget 2025–26, the analysis shows that approximately 140 activities out of more than 500 listed align with Climate Bonds Taxonomy sectoral criteria. These aligned activities account for nearly 45% of the total budgetary allocation.

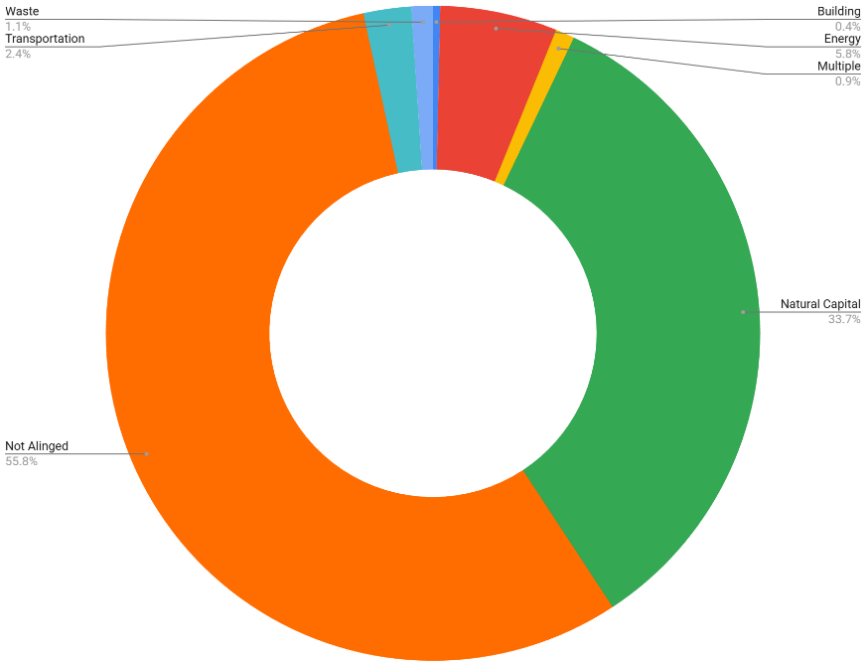


Figure 27: High Level Assessment of Assam's Green Budget with Climate Bonds Initiative Taxonomy; Source: Indicc

In Rajasthan Green Budget 2025-26, around 60% of the items were found to be overlapping across multiple themes such as energy, water and waste. 8.5% of the projects were found to have no alignment with the taxonomy. Additionally, it was observed that multiple items had the same descriptions making it difficult to decipher their alignment.

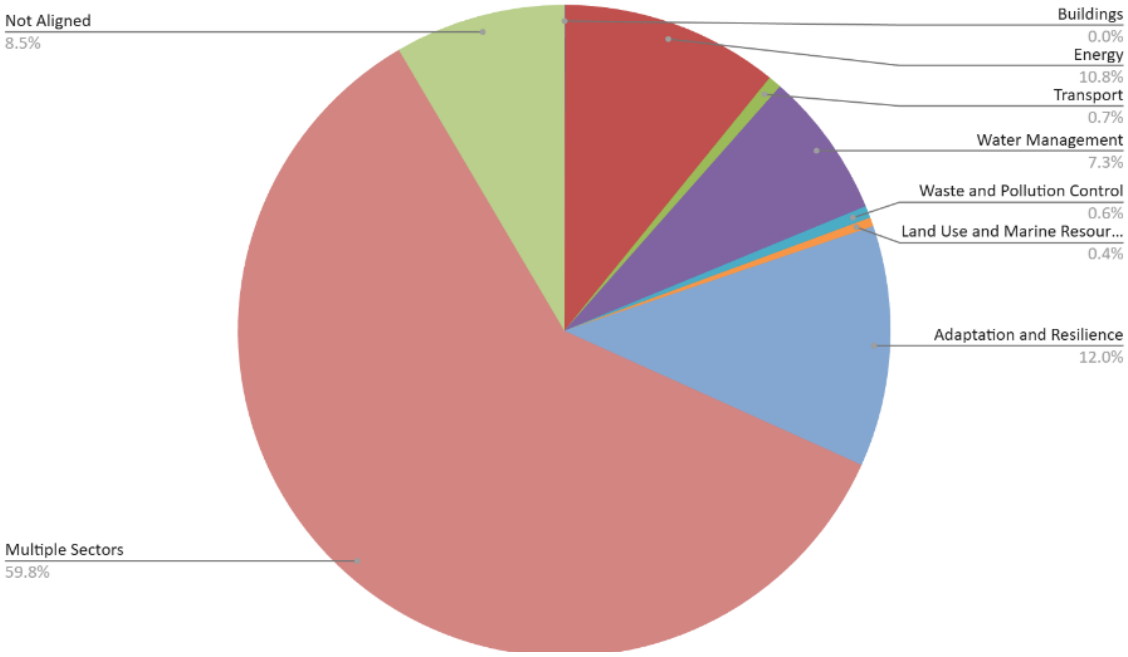


Figure 28: High Level Assessment of Rajasthan's Green Budget with Climate Bonds Initiative Taxonomy; Source: Indicc

Key Message: *Alignment with internationally recognised climate taxonomies can make green budgets as tool to leverage investor interest and can help better understand the extent of green portfolio that states might have. A more coherent pathway can be built at the state level through well prepared transition plans which could then feed into Green Budgets.*

4. Governance and administration focusing on Institutional Design

From the 10 states considered in this report, only the state of Tamil Nadu has instituted dedicated funds to mobilise climate finance from various sources. The landscape in figure 29 depicts a continuum of funding instruments- from grants for public-interest projects, through blended and concessional finance for early-stage ventures, to institutional equity and debt funding for growth businesses and finally capital market access for mature enterprises.

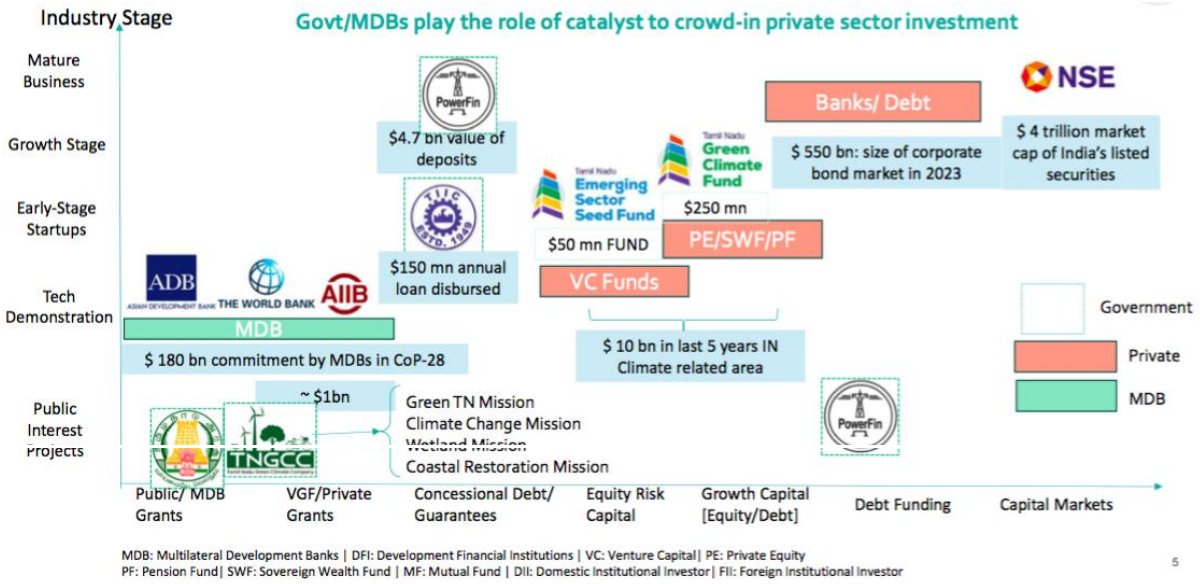


Figure 29: Financing Institutions, Structures, and Instruments (Tamil Nadu)

Across this spectrum, the Government of Tamil Nadu and MDBs act as catalysts, crowding in private-sector investment, de-risking project propositions and accelerating the climate transition.

Missions such as the Green Tamil Nadu Mission, Climate Change Mission, Wetland Mission and Coastal Restoration Mission are fully backed by the Government of Tamil Nadu and Multilateral Development Banks (MDBs) such as ADB, World Bank and AIIB.

As projects gain traction, they can access viability gap funding (VGF) and private grants to bridge early-stage risks. At the next stage, concessional debt and guarantees are available through development finance institutions such as the Tamil Nadu Industrial Investment Corporation (TIIC) enabling sector agnostic and climate focused ventures or

the Power Finance Corporation, which primarily raises debt for power projects and also supports renewables.

Building on this foundation, Tamil Nadu has established dedicated equity-based vehicles such as the Emerging Sector Seed Fund (USD 50 million) and the Tamil Nadu Green Climate Fund (USD 250 million), which provide risk capital to startups and growth-stage enterprises. As projects mature, Tamil Nadu increasingly benefits from India's broader capital market ecosystem, which offers a USD 550 billion corporate bond market and a USD 5 trillion listed equity market. These markets present significant opportunities for scaling climate finance through instruments such as green bonds, ESG-focused equities and large-scale debt financing.

To summarise, Tamil Nadu's climate finance landscape reflects a layered architecture in which the government and MDBs assume the role of first movers, de-risking early interventions and crowding in private capital as projects advance. This approach ensures that climate initiatives transition from grant and concessional funding to commercially sustainable finance mechanisms enabling the capital to move from one stage to the other.

Tamil Nadu exemplifies a core principle of capital mobilisation i.e. capital needs to move seamlessly from one project to the other and through various risk stages of projects. This necessitates a discussion on how this could be done across states with the help of instruments and structures discussed in this report.

CHAPTER VII

NEED FOR INTEGRATED TRANSITION PLANS AT THE STATE LEVEL AND INSTITUTIONAL DESIGN

As discussed in the overview chapter, mobilization of climate finance for green infrastructure in developing economies including India faces a profound mismatch between the scale of investment required and finance available. As most of the action will be at the level of states which themselves are fiscally constrained, there is a need to focus on two important aspects. This would include rethinking financial architecture within which projects are conventionally designed and the operational modalities that states must follow to mobilise the required finance without fiscal overhang. These are discussed below briefly.

1. Need to rethink prevailing financial architecture to meet finance requirement for climate action

Typically, conventional finance operates on a linear model where capital whether sovereign, concessional, or private is committed at the start of a project and remains locked or static for the duration of the asset's life. In other words, capital often remains trapped on balance sheets for a long term which creates balance-sheet congestion, where lack of exit routes prevents the same dollar from being recycled into the next greenfield project.

Commercial capital also often holds onto loans long after the construction risks have subsided to harvest high interest rates, rather than refinancing them to free up capital for new construction. On the other hand, institutional investors, such as pension and insurance funds possess vast pools of patient capital but are structurally ill-suited to absorb the high risks of the construction phase.

Further, there is the issue of information gaps which manifest at two levels. The first kind of information asymmetry prevents effective transition planning at the state government and at the level of state PSEs. Reasons for this effectively emanate from lack of localisation of NDCs at the level of states which in turn results in weak linkages to formulate policy targets. The vagueness in policy targets also prevents reverse engineering states' commitment to India's NDCs and the quantification of quantum of climate finance across sectors and collectively for the state.

The second type of information asymmetry persists in traditional project design models. Conventional project design models rely on demand forecasts and risk assessments which are made before projects hit the ground. These assessments run the risk of becoming static assumptions due to rapid technological change, shifting economic cycles, and climate fluctuations. In other words, forecasting in large infrastructure is often systematically biased toward strategic optimism to secure project approval, which leads to inevitable cost overruns and demand shortfalls when economic and climate uncertainties materialise.

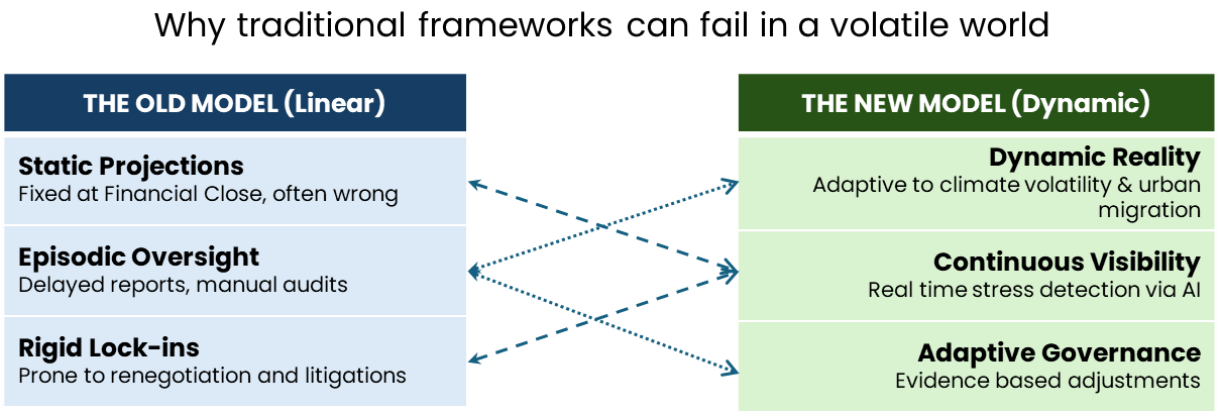


Figure 30: The Informational Limits of the Linear Model; Source: Indicc

This means that by the time a regulator detects deteriorating performance projects, the fiscal exposure has already increased. MDBs themselves show conservatism leading to a focus on sovereign repayment capacity rather than the long-term economic returns of climate assets. In India, even long-term private capital prefers lending to highly rated entities which protects their investors' interest. The result is that finance does not adequately flow to several important areas which limits the scale and increases cost of capital as well. This also affects development of well-rounded bond market and prevents attracting niche investors seeking opportunities aligned with their values, such as environmental sustainability or social impact.

Amidst the prevailing scenario, the trinity of three instruments/structures become extremely crucial. These are Public Private Partnerships (PPPs), Infrastructure Investment Trusts (InvITs) and Infrastructure Debt Fund (IDF). While InvITs and IDF can help recycle capital without fiscal overhang as discussed in the overview section (chapter I), the role of PPP is very critical in the context of climate action and in conjunction with InvITs/IDFs.

Over the last decade, India developed what is perhaps one of the largest PPP programmes in the world. As per the World Bank, India is one of the leading countries in terms of readiness for PPPs. Towards this endeavour, India took several significant steps to develop comprehensive support for PPPs. Key amongst them include creating a Harmonised List of Infrastructure in 2012 and publishing detailed guidelines on various aspects of PPPs such as Model Concession Agreement, Tool Kits for sector PPPs, empanelment of Transaction Advisors, Guide for PPP appraisal, guidance for municipal bond financing and setting up of state level PPP units.

As of 2019, out 1823 PPP projects listed with the Ministry of Finance, Government of India green sector projects as per ICMA standards comprised 28% and nearly 97% of the green sector projects were implemented by state-level and municipal bodies[73]. Even in the 10

73 Are PPP Arrangements Different in Green Infrastructure Sectors? an Exploratory Analysis of Indian PPP Projects: Raghu Dharmapuri Tirumala and Piyush Tiwari; Axes of Sustainable Development and Growth in India - Essays in Honour of Professor Jyoti K. Parikh/ Department of Economic Affairs, Ministry of Finance, Government of India.

states considered in this report, explicit green PPP opportunities are several and across multiple sectors.

Table 19 maps the explicit references to public-private partnerships within the current energy, electric vehicle and urban development policies of the ten states in scope. The mapping is designed to surface two things: first, the depth of PPP articulation in state policy, that is, whether PPPs are referenced as a generic instrument or specified with risk allocation, revenue models and concession tenor; and second, the sectoral distribution of PPP activity across states, which reveals where state administrative capacity and private sector appetite are currently co-located. The table is a policy-document mapping and does not by itself measure PPP execution; that measurement requires separate assessment against the India Infrastructure Finance Company Limited and NITI Aayog PPP project pipelines.

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Table 19: Explicit PPP Opportunities in Energy, EV and Urban Development Policies of 10 States

State	EV	RE	Urban
Andhra Pradesh	• EV infrastructure Charging Point Operators; • 'Green routes' for charging facilities along E-Mobility corridors • University for Green Energy & Circular Economy	• Development of Solar Parks by APSPCL or private developers. • Battery Energy Storage Systems (BESS) • Distributed Energy Resource Aggregators.	• Smart Cities initiatives focus on multistoried complexes, parking, and markets; • Land pooling schemes for model townships Development of utility corridors and optical fiber networks along national highways and expressways; • City-side development • Urban planning for water supply, sewerage, transport, and other public utilities.
Assam	• EV charging stations allowed under BOOT (Build-Own-Operate-Transfer) on unutilized government lands	• Solar Parks through JVs, up to 50% equity participation by state	• Climate-resilient water supply, stormwater drainage • Urban local body reforms to improve revenue and institutional capacities • Creation of urban flood resilience infrastructure • Urban planning policies aimed at strengthening planning and delivery of urban services
Bihar	• EV charging station networks. • Charging stations on leased government land		• Affordable housing aligned with PMAY, including allocation for EWS and slum redevelopment • Infrastructure development in water supply, sanitation, stormwater drainage, sewage, and transport; • Livelihoods creation for urban poor • Capacity building for sustainable urban growth.
Gujarat		• RE Parks and hybrid projects with private participation	• Development of satellite and theme townships

			• Professional cadre reforms and infrastructural upgrade programs
Jharkhand	• Solar based EV charging stations	• Solar Parks support through Joint Ventures with private developers, up to 50% equity participation	• Affordable housing policies on government land • Slum redevelopment and rental housing schemes
Maharashtra	• Viability gap funding for DC fast charging stations		• Affordable housing programs • Sustainability measures such as waste-to-energy and eco-friendly construction • Increasing digital connectivity and disaster resilience measures across urban areas
Odisha	• EV charging and battery swapping stations across cities and highways • Deployment of 400 electric buses under PM e-Bus Sewa and Bhubaneswar Metro plans	• Projects awarded to JVs of SPSUs and CPSUs in projects like large hydro, Pumped Storage Hydro, and floating solar.	• PMAY-Urban targets 50,000 affordable housing units with emphasis on sanitation and solid waste management. • Strategic partnership with UN-Habitat for climate-resilient urban planning and capacity building
Rajasthan	• Charging stations	• Promotion of Solar, Wind and Hybrid RE Parks via JVs with up to 50% equity participation.	• Sustainable urban development to improve livability and infrastructure across cities via entities like Jaipur Development Authority and Rajasthan Housing Board
Tamil Nadu	• Charging infrastructure and public battery swapping stations	• Wind Repowering Aggregation projects under Special Purpose Vehicle/Joint Venture schemes.	• Tamil Nadu Urban Development Fund (TNUDF) • Tamil Nadu Green Climate Fund (TNGCF) • Tamil Nadu Shelter Fund (TNSF) etc.
Uttar Pradesh	• EV public buses on PPP mode with charging stations development	• Development of Solar Parks	

Over time, however, PPPs hardened into standardised institutional forms. Appraisal methodologies, model concession agreements, and regulatory practices converged around a framework that privileged ex ante risk allocation, long-term contractual certainty, and arm's-length oversight. The result is a model that treats infrastructure risk as something that could be priced once, allocated contractually, and then managed primarily through compliance mechanisms[74].

The environment in which PPPs now operate differs fundamentally from that which shaped this design. Fiscal stress has become structural rather than cyclical. Governments face persistent debt pressures alongside rising demands for social expenditure, climate adaptation, and urban infrastructure.

At the same time, infrastructure systems themselves have evolved into complex socio-technical assemblages. For instance, transport networks are embedded within digitally mediated logistics chains; power systems must integrate variable renewable generation and water utilities operate under hydrological regimes that increasingly diverge from historical baselines. Governance frameworks premised on stability, predictability, and infrequent feedback are therefore increasingly misaligned with the realities they seek to govern[75].

In this context, PPPs can no longer remain just a technical choice for procurement, but they have to become foundational requirement for climate action because they fuse private efficiency with public value. PPPs allow the government to shift its role from being a grant-giver or guarantor of last resort to an architect of value creation. By bringing in private partners, governments can de-risk the construction phase of green projects, improve operational efficiency, and capture the latent value created by infrastructure such as land value appreciation or retail rights to raise additional financing for projects.

But for this to effectively happen, informational foundations must be introduced in PPP governance to ensure transparency and predictability. Here, artificial Intelligence can act as the 'informational spine' that provides this credibility. By replacing static, episodic reporting with real-time, continuous monitoring, AI can enable adaptive forecasting reducing the risk of the forecasting failure that often leads to costly project renegotiations, predictive maintenance for converting maintenance from a source of uncertainty into a managed variable and dynamic risk assessment that integrates operational and climatic signals with the asset. Essentially, this will entail shifting the project governance from long term to shorter time frames which in turn would require rethinking on financial provisions like viability gap funding and other financial instruments which play a role only at a certain stage of the project rather than when need arises.

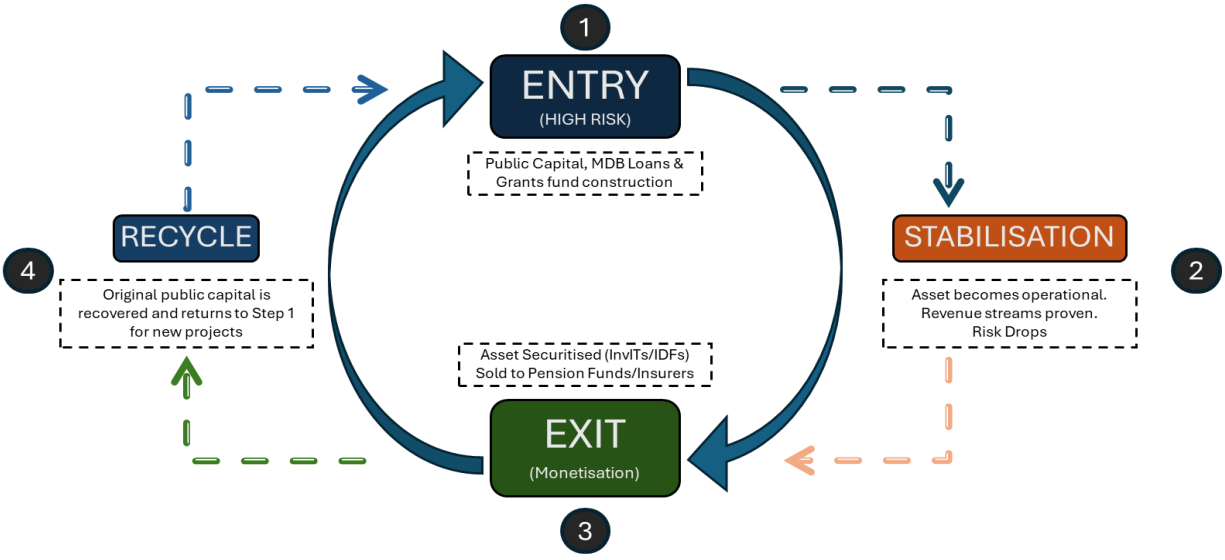
74 Circular Capital and the Informational Limits of Conventional PPP Architecture by Dr Arvind Mayaran
75 Circular Capital and the Informational Limits of Conventional PPP Architecture by Dr Arvind Mayaram

With this as a base, circularity/or recycling in financing can be introduced. The Staged Lifecycle of Capital Recycling can function in the following way.

- High-Risk Phase (Construction/Early Operation): Public or concessional capital from Multilateral Development Banks (MDBs) enters during the early, riskiest stages. This reduces early-stage risk and signals government commitment to private investors.
- Operational Stability Phase: Once the project demonstrates predictable performance, private equity and commercial debt are introduced, often supported by MDB guarantees or first-loss provisions to mitigate remaining risks.
- Maturity and Exit Phase: When cash flows stabilize, the project is securitized into instruments like Infrastructure Investment Trusts (InvITs) or Infrastructure Debt Funds (IDFs). Institutional investors, who seek low-risk, long-term returns, purchase units in these trusts. This allows the original risk-taking capital (public or concessional) to exit and recycle into new greenfield climate projects.

The Blueprint: Defining Circular Finance

Capital is neither trapped nor static but continuously recycled



As discussed, in earlier sections of this report, India's experiments with InvITs provide tangible evidence of equity and debt circularity. InvITs pool income-generating assets, allowing sponsors to deleverage their balance sheets and free up equity for reinvestment. By down-selling mature assets to these trusts, the sovereign can repay earlier loans and contract new ones for the next wave of green projects without creating fiscal instability.

Conceptually, InvITs can also help raise finance for 'resilience' projects which are not otherwise commercially attractive. In such a case, bundling of assets under InvITs would have to be planned in a such a way that there are a plenty of revenue-generating projects at a high rate of return along with a few which have lower returns.

Further, since green infrastructure is overwhelmingly debt-funded, Infrastructure Debt Funds (IDFs) can help achieve full debt-side circularity. IDFs are designed to refinance bank loans once projects become operational, extending maturities and attracting private capital to de-risked debt. This prevents debt from remaining trapped on bank balance sheets long after construction risks have subsided, thereby freeing up lending capacity for new climate project.

Incidentally, India's experience in InvITs, IDF, PPPs and a vibrant AI ecosystem along with transaction advisory bodies can help not just in project preparation but also in ensuring seamless capital flow from one sector to the other and from one project to the other.

2. Operational Modalities to Expand Climate Finance at Sub-National without Fiscal Overhang

In order to do that effectively an operational mechanism may be introduced at level of states.

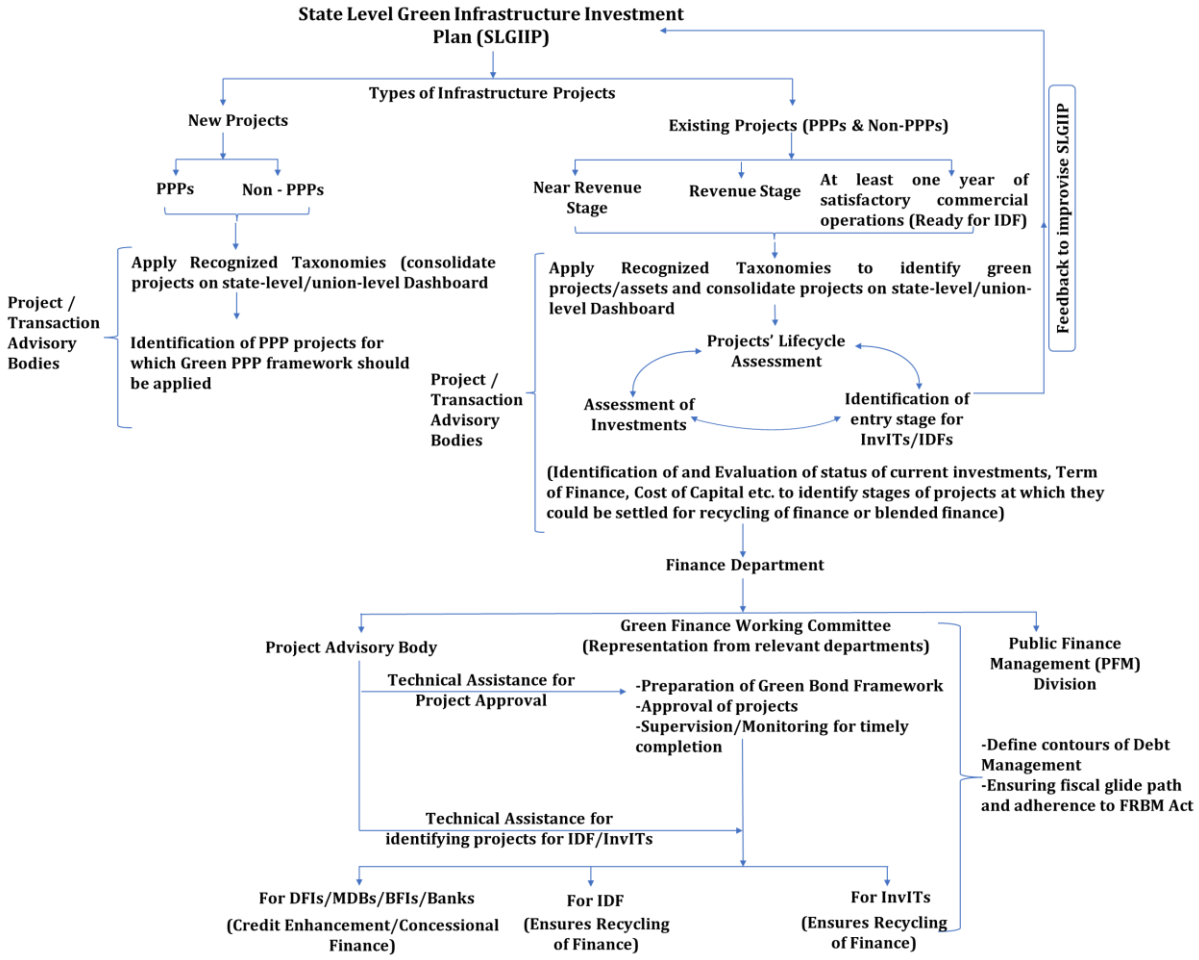


Figure 31: Institutional Framework to Attract Private Capital (at scale) for Green Infrastructure Development; Source: Indicc

To operationalize the use of above strategies/instruments/structures, states may commence a process of putting together a State Level Green Infrastructure Investment

Plan. While such a plan requires an exhaustive process that may take time, the contours of the plan can be sketched out and implemented immediately through a top down and bottom-up approach deployed simultaneously.

For this purpose, as a first step the state may task a transaction advisory body as an exclusive agency to provide consulting and advisory support to the government on identification and implementation of Green Infrastructure. To ensure this, such a body would need to be capacitated in Green Taxonomy as well as Green Bond Framework.

The Transaction advisory body should carry out an exhaustive stock taking of all infrastructure projects. These could be divided into two categories – new projects as well as existing projects. These projects could be in PPP or non-PPP mode, managed by different entities including Public Sector Companies, Public Finance Institutions et al.

As a next step, internationally recognized taxonomy should be used for Green classification. Thereafter, each project could be evaluated using following filters namely Near Revenue Stage, Revenue Stage Projects and projects with at least one year of satisfactory commercial operation.

Such a classification helps to determine the degree of risk from finance perspective. Since the projects are likely to have different lifecycle and investors, it is also important to assess 'investments-risk-duration' dynamics. This is likely to reveal asset-liability mismatch and hence can provide an informed idea of that stage of the project where new and cheaper sources of finance can come in through Infrastructure Debt Funds or where projects can be hived off in a de-risked special purpose vehicle for market financing through InvITs.

This will not only help in unlocking public finance to crowd in more private capital for new infrastructure projects but may also substantially reduce fiscal overhang by introducing circularity of finance. The only downside risk, however, is that attractive projects are also attractive for banks and without a disincentive for banks to pass on the loans to instruments like IDFs, the banks may like to hold on to the projects longer than necessary.

In the absence of any such regulation that may enable IDF to smoothly take over bank loans, it becomes extremely important for projects to be conceived in such a way that their financing tenure with respect to different kinds of investors can be pre-determined. This requires a high project development calibre, an aspect that can again be ensured by transaction advisory firm.

Finance Department of the state government can thereafter set up a climate finance Working Committee, essentially for the issuance of Green Bonds and approval of projects. Such a committee can again benefit from transaction advisor's expertise while a dedicated Public Finance Management division can simultaneously keep a track on debt levels and public debt management.

CHAPTER VIII

RECOMMENDATIONS

This report is about climate finance mobilization at the subnational level in India. In this regard, it aims to capture the landscape, barriers and opportunities. As this report lists these elements in various chapters, an important question emerges simultaneously i.e. the capital by its very nature should be fluid and therefore its seamless flow requires both - dredging and gradient. In this report dredging is represented by set of policy initiatives, targets, incentives and support mechanisms coming from the center and states for market creation and financial innovation at the sub-national level, and the gradient is represented by instruments, structures and propositions that would help recycle the finance from one stage of the project to the other and from one sector to the other. The gap in the climate finance requirement implicitly suggests that climate capital is not moving at a pace and scale that it should despite numerous Indian states showing momentum towards green growth. Therefore, on the one hand there is a need to smoothen dredging process, on the other hand there is a need to reconceptualize financing to allow seamless flow.

With these two aspects in mind the following recommendations provide specific action agenda.

1. Moving towards transition plans

Capital mobilization and management require planning and strategy. These aspects are central to attracting investors. Therefore, as a first step states must articulate state determined contributions in alignment with India's Nationally Determined Contributions. This should serve as a north star for state departments, state level public sector undertakings and municipalities to further articulate their own contributions/action. Though desirable, this approach may not be achievable in the same sequence. Therefore, at the very least, existing climate specific initiatives, policies, targets and incentives must be collated and structured to arrive at the quantum of capital required cumulatively and for specific goals. This should result in transition plans by respective entities and will provide signals to investors about what is needed, by whom and by how much. Capacity support may be needed by the state governments to carry out this objective.

2. Responding to unpredictability of risks

Once this is done the question is how to mobilize the required quantum. For this, there is a need to recognize a few elements. First, economic and financial systems frequently tend to diverge from predictable cycles. Fiscal stress has become structural across both advanced and emerging economies; climate patterns are increasingly non-stationary; technological change is accelerating; and geopolitical disruptions are more frequent and system wide. These are not isolated shocks; they reinforce each other and persist over time, creating a continuously shifting risk environment. Existing instruments such as viability gap funding, subsidies, and guarantees are typically front-loaded and static,

addressing risks at specific stages rather than across the project lifecycle. Therefor there is a need to develop lifecycle-based financing approaches, including revenue-smoothing structures and return-linked balancing mechanisms that adjust support as project revenues evolve. These mechanisms can absorb volatility while maintaining fiscal discipline. They will enable much needed flow and liquidity in finance.

3. Introducing circularity in finance

Despite the above financial structuring is wedded in old paradigm. The central constraint lies in the persistence of linear financial architecture i.e. capital, whether public, concessional, or private is committed at financial closure and remains locked in over the asset's lifecycle, even as project risk declines over time. This linearity is compounded by the absence of mechanisms for credible performance visibility and for risk reclassification over time, limiting capital's ability to exit mature assets and be redeployed into new investments. The result is persistent mispricing of risk, congestion on bank and sovereign balance sheets, and under-participation of long-term institutional investors. The implications are visible across the system. Banks continue to hold de-risked assets that yield relatively high spreads, while institutional capital which is better aligned with stable, long-term cash flow remains below potential. This creates a dual constraint, i.e. inadequate scale of finance and low circulation of capital, both of which increase the cost of capital and slow the rollout of resilient infrastructure.

An effective response to this would be to work through a framework for enabling circular financing. Given the long gestation risk profiles of infrastructure assets, this will involve examining how different forms of capital, namely public, concessional (including multilateral banks' loans), institutional and private, can be optimally deployed and transitioned across project stages, including development, construction, stabilization and monetization.

In particular, this would involve working with financial structures such as Public Private Partnerships, joint ventures, special purpose vehicles and pooled debt obligations in high-risk stages and thereafter recycling capital through asset monetization and capital market instruments like Infrastructure Investment Trusts and Infrastructure Debt Funds for enabling exit and reinvestment. This will free up public capital for contracting new high-risk projects and attract private capital in low-risk stages. For this to effectively happen there is a need to move towards risk-rated interest rates.

4. Calibrating PPPs for climate action

PPPs remain central to climate infrastructure delivery, but their current design reflects a more stable operating environment. Long concession periods are combined with fixed projections and static risk allocation, creating a structural mismatch under conditions of climate variability and technological change. Once embedded in contracts, these projections shape financial structures for decades, with limited flexibility when

outcomes diverge. Therefore, there is also a need to focus on embedding adaptive mechanisms within PPP design—linking performance benchmarks, risk allocation, and financial terms to observable outcomes over time rather than fixed ex ante assumptions. This shifts PPPs from static contracts to evolving arrangements, reducing renegotiation risk and improving long-term viability. Further, public procurement is the principal instrument through which PPP design is operationalised. In emerging economies, where procurement accounts for a significant share of GDP, it directly shapes market behaviour and investment patterns. Therefore, there is a need to examine how procurement processes—RFQs, RFPs, bid evaluation frameworks, contract structures, and financing options—can be redesigned to embed lifecycle performance, climate resilience, measurable environmental criteria, and circular financing from the outset. This includes aligning procurement rules with long-term asset performance rather than lowest-cost selection and ensuring that climate objectives are translated into enforceable contractual outcomes.

Additionally, climate-aligned standards are necessary to guide investment, but their effectiveness depends on their alignment with institutional capacity, access to technology, and affordability. Standards that exceed absorptive capacity risk becoming exclusionary or raising project costs without improving outcomes. Therefore, there is a need to examine how standards interact with financing and procurement systems across sectors, and how they can be sequenced and calibrated to support transition without constraining participation of private actors or creating unsustainable fiscal burdens.

5. Use of Climate Taxonomy

Use of international climate taxonomies should be mandated till such time India's own taxonomy is released. International standards should be adjusted to India's net zero goals. This is the one of the primary conditions to mobilize climate finance. Green Budgets of states also need to be aligned to such standards to avoid misclassification and elicit investor interest.

6. Some key steps for increasing the quantum of finance

Other the public procurement under PPPs, the scale of climate finance can be increased through following mechanisms.

6.1 Green Sustainable Development Goals

Green SDLs can broaden labelled green bond market substantially while bringing the cost of capital down and positively reflecting on quality of expenditure (as they are use of proceeds bonds). However, this will require capacity building within the government to screen projects for green SDLs using recognised climate taxonomy.

6.2 Expanding the utility of Partial Credit Enhancement

A PCE facility can enhance investment in infrastructure projects for lower rated state entities i.e. those lower than investment grade. Efforts must be made to improve accounting hygiene and capacity on building project pipelines for continuous cash flows, amongst other things.

6.3 Make urban development projects market ready

Standardization of projects under national frameworks on urban development aggregates and structures information which can enable large-scale capital to flow into a sector that was otherwise fragmented and opaque to be considered as a coherent asset class. However, identification of green projects in the urban development sector would require a detailed vetting of projects with climate taxonomy and attributes of circular financing. Further, municipalities should be encouraged to become market oriented through better accounting hygiene and escrowing certain line items for debt servicing. In order for making municipalities ready for green bond issuances efforts may be made to follow a three-step process i.e. from raising loans to issuing vanilla bonds and thereafter graduate to issuing green bonds. This is because green bond issuances require very high compliance standards. Further, pooled financing can be encouraged as it mitigates individual municipality risk through portfolio diversification and centralized governance. It also enables the use of blended finance-where concessional capital from multilateral agencies is layered with commercial debt-to improve affordability and sustainability.

7. Addressing financing for resilience

Resilience ensures future proofing investments. Resilience can be built in projects with high rate of return, low to modest rate of return and no rate of return. While the third category can be supported through public finance and low-interest rate financing from MDBs and BFIs, the first two categories can also be financed through InvITs by bundling assets in a such a way that there are a plenty of revenue-generating projects at a high rate of return along with a few which have lower returns. Increasing use of resilience taxonomy would help states track progress in resilient infrastructure.

8. Value Capture Finance

Value Capture Finance can unlock new financing for climate aligned infrastructure development**.** It has emerged in India as a response to the growing mismatch between infrastructure investment needs and limited fiscal capacity. Large public investments in metro rail, highways, urban redevelopment and transit-oriented development generate significant increases in surrounding land and property values. Traditionally, these value gains accrue privately to landowners and developers, while the cost of infrastructure is borne by the state. Value capture seeks to partially rebalance this asymmetry by enabling

public authorities to recover a portion of the land value uplift created by public action and reinvest it into infrastructure financing. To unlock value capture finance in larger volumes, land lease may be considered for the duration of the projects for which land has been acquired rather than long term lease which prevents land value to be unlocked by the state governments effectively.

9. Sustainable Industrialisation

While extremely important, sustainable industrialisation represents a complex universe due to difficulty in reporting; mandated and voluntary reporting standards; fundamental misalignment with global investor expectations for credible climate transition planning due to varied depth of disclosures; alignment of state incentives with reporting requirements and cumbersome tracking of outcomes against tax expenditures et al. Particularly, with respect to MSMEs there is also a need for uniformity between BRSR lite and Industry led standards like GreenCo. A dedicated body of concerned state departments and industry body may be set up for effective implementation and monitoring of sustainable industrialisation in states.

10. Financing Sustainable Agriculture

Natural farming can potentially reduce input costs for farmers, reduce energy subsidies, create new post-harvest markets as well as new markets for inputs. States can attract investments in this sector through identification of specific targets and repurposing subsidies, amongst other things. In Rajasthan, a government commissioned policy study shows that with a 20 percent scale of Natural farming, the state of Rajasthan can save up to USD 96-100 million. Such savings or part of it can be potentially escrowed to provide a part of transition funding. For effective subsidy repurposing a programme level separate state accounting mechanism is recommended where cost savings can be escrowed for scaling up.

indicc
associates

www.indicc.in

info@indicc.in