

Policy Brief | March 2026

Mobilising Private Finance for Climate Investment in India

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Suggested citation: Dutt, Arjun, Dishant Rathee, and Gagan Sidhu. 2026. *Mobilising Private Finance for Climate Investment in India*. New Delhi: Council on Energy, Environment and Water.

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Peer reviewers: Runa Sarkar, Professor, Economics Group, IIM Calcutta; Labanya Prakash Jena, Visiting Senior Fellow, LSE; Dr Dhruva Purkayastha, Director, Senior Advisor, Climate and Sustainability Initiative; Ananya Mukherjee, Senior Programme Lead, CEEW Green Finance Centre.

Publication team: Archana Chandrashekar (CEEW); Alina Sen (CEEW); The Clean Copy; Madre Design; and FRIENDS Digital Colour Solutions.

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About CEEW-GFC

The CEEW Green Finance Centre (CEEW-GFC) is a special initiative of the Council on Energy, Environment and Water (CEEW), one of Asia's leading think tanks.

CEEW-GFC acts as a non-partisan observer and catalyst that aims to bridge green financing gaps by addressing financing bottlenecks and enhancing the integration of green considerations in financial decision-making. Its approach is multi-pronged: tracking market trends, publishing research and analysis, developing financial solutions, offering technical assistance, and fostering coherence between policymakers, regulators, financial institutions, and industry.

Financing the green transition

India—and other emerging countries—are at different stages in their journey towards a net zero economy. Yet, the challenge of financing this transformation endures. CEEW-GFC estimates that India would need over USD 10 trillion to reach net zero by 2070, with additional investments required for climate adaptation and other environmental imperatives.

While conducive policies and regulations are steering capital flows towards green initiatives, the cost and availability of financing remain critical barriers. Emerging markets, already constrained in mobilising capital for economic development, face even greater hurdles in securing investments for sustainability. Balancing economic growth with a green transition further complicates the challenge, making continuous analysis and engagement essential for a successful transition.

CEEW-GFC's approach

CEEW-GFC is at the forefront of identifying trends, analysing policies, and designing financial solutions across the green financing spectrum. Its work enables:

- Stronger engagement with policymakers and regulators, ensuring a more effective policy environment.
- Innovative financial solutions, tailored to overcome funding gaps.
- Integration of green considerations in financial decision-making.
- Capacity building through training and workshops, nurturing expertise in sustainable finance.

CEEW-GFC evolved from the CEEW Centre for Energy Finance (CEEW-CEF), launched in July 2019 in the presence of H.E. Mr Dharmendra Pradhan and H.E. Dr Fatih Birol.

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Executive summary

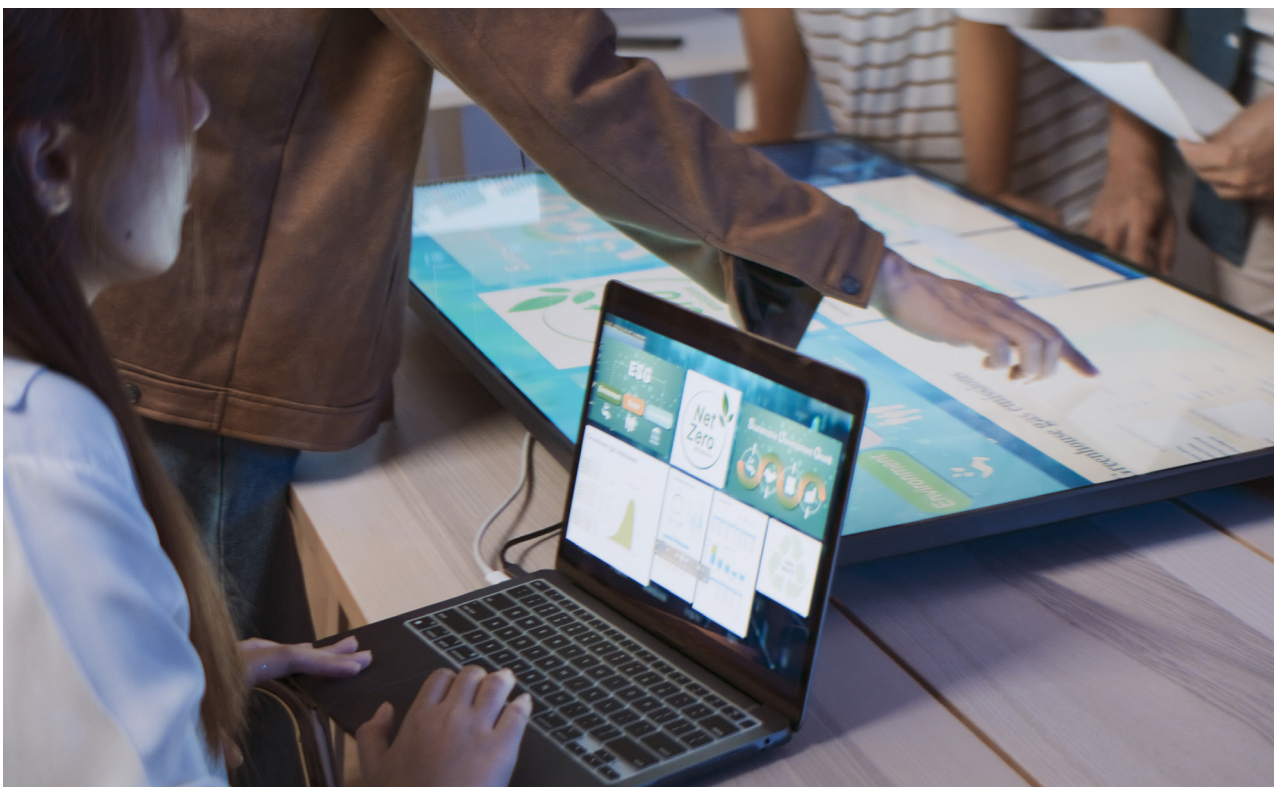
Combating climate change is one of the defining challenges of the 21st century. Accelerating decarbonisation and investing in climate adaptation are essential to limit the rise in the global average temperature and foster climate resilience, in line with the objectives of the Paris Agreement. Climate action, in general, entails considerable investment in hard physical assets. In the case of climate mitigation, these assets include solar panels, wind turbines, electric vehicles (EVs), charging infrastructure, and electrolysers. Climate adaptation similarly requires substantial investment in physical infrastructure, such as heat-resistant roofs, coastal embankments, storm shelters, and sanitation systems, complemented by non-infrastructure approaches, including community engagement and knowledge sharing.

These physical assets are typically capital-intensive and well-suited to debt financing. For example, debt accounts for ~75 per cent of the capital expenditure of solar and wind power plants (Dutt et al. 2021). As a result, adequate and affordable finance is a critical enabler of climate action, particularly in emerging market and developing economies (EMDEs). Yet,

despite accounting for ~25 per cent of the global gross domestic product (GDP), these countries (excluding China) account for less than 15 per cent of global climate finance flows (Stewart et al. 2024). This policy brief presents a unique 3x3 framework to mobilise private capital to address this pressing challenge in the Indian context, which may also find relevance in other EMDEs.

The role of private finance in climate action

The *Fourth Report of the Independent High-Level Expert Group (IHLEG) on Climate Finance* estimates that EMDEs (excluding China) will need to invest USD 3.2 trillion annually by 2035 in climate and nature to meet the goals of the Paris Agreement (Bhattacharya et al. 2025). It estimates that ~60 per cent of this requirement (USD 1.9 trillion) will need to be mobilised from domestic sources, with the remaining ~40 per cent (USD 1.3 trillion) coming from external sources.



Although the finance mobilised from both domestic and external sources will comprise a mix of public and private capital, the IHLEG highlights significant gaps pertaining to private capital. It estimates that private finance flows from domestic and external sources would need to increase by 9-fold and 16-fold, respectively, to meet annual investment needs by 2035. This is unsurprising considering the constraints on availability of public capital in EMDEs, whether from domestic or international sources. In EMDEs, the fiscal space for climate action is constrained by the need to service elevated sovereign debt and fund competing development priorities. Further, aid from developed countries is projected to decline by 9–17 per cent in 2025, following the 9 per cent decline in 2024 (OECD 2025).

In this global context, India's climate ambitions also require large-scale investments. Three sectors—power, road transport, and industry—collectively account for ~70 per cent of India's greenhouse gas (GHG) emissions (MoEFCC 2024). Achieving net-zero emissions by 2070 would require investments of ~USD 10 trillion to decarbonise these sectors over the 50-year period leading up to that year (Singh and Sidhu 2021). More recently, the NITI Aayog, in a report released in February 2026, which followed a different set of assumptions, estimates that India will require ~USD 22.7 trillion for decarbonising these sectors. In the near term, decarbonising these sectors represents a ~USD 500 billion investment and sales opportunity by 2030. In addition, India will need to invest ~USD 700 billion by 2030 in climate adaptation to build resilience (MoEFCC 2023a).

How have existing policies facilitated private finance mobilisation?

Mobilising private finance at scale is essential to meet India's investment requirements. In this context, policy and regulation play a critical role in creating enabling conditions for the flow of private capital. India's policy landscape, comprising sectoral and cross-cutting policies across mitigation and adaptation, features a multi-dimensional approach to creating the necessary enabling investment environment. With respect to mitigation, policies on renewable

energy (RE), electric mobility, and green hydrogen (GH2) span several dimensions, including sectoral targets, procurement transparency, demand certainty, supporting infrastructure, offtaker risk, financial incentives, fiscal incentives, and a carbon market.

With respect to adaptation, the central government has identified seven key sectors – agriculture and allied sectors, water, forestry and biodiversity, coasts and islands, the Himalayan ecosystem, disaster management, and health (MoEFCC 2023a). Policy interventions to build climate resilience similarly operate across various dimensions. These include the *National Action Plan on Climate Change* (NAPCC), the National Adaptation Fund for Climate Change, state action plans on climate change (SAPCC), heat action plans, financial incentives for municipal bond issuance, and schemes that deliver adaptation-related co-benefits.

Beyond sectoral measures, a range of cross-cutting policies and regulations, particularly by finance-sector policymakers and regulators, have further facilitated climate finance flows. These include the Framework for Sovereign Green Bonds, engagement with Article 6 international carbon markets, foreign direct investment (FDI) regulations, RBI's priority sector lending regulations, the Framework for Green Deposits, Business Responsibility and Sustainability Reporting (BRSR), Securities and Exchange Board of India (SEBI) frameworks for green and environmental, social, and governance (ESG) bonds, and the International Financial Services Centres Authority's (IFSCA) Framework for Transition Bonds.

In addition, some cross-cutting measures were in the draft stage at the time of writing. These include India's climate finance taxonomy and a framework for lenders to disclose climate-related financial risks (applicable to specific Reserve Bank of India (RBI)-regulated entities).

While the policy ecosystem in India has had notable success in mobilising private climate finance, more interventions are needed to unlock higher flows consistent with India's climate objectives.

Climate finance in India: Current flows and desired levels

The evolving policy environment has helped catalyse significant climate finance flows in India. The average annual climate mitigation finance flows for 2021–22 stood at USD 50 billion (CPI 2024). The majority of these flows (83 per cent) were sourced domestically. Within domestic sources, the private sector contributed nearly two-thirds (66 per cent), while public sources made up the remainder through budgetary expenditure by the central and state government and investments by public sector undertakings (PSUs). International sources accounted for the remaining ~17 per cent of climate mitigation flows, of which 63 per cent came from private investors and the remainder from public sources.

In contrast, the average annual climate adaptation finance flows for 2021–22 in India amounted to ~USD 15 billion. Nearly all these flows (98 per cent) were sourced from domestic public sources, primarily from central and state government budgets. International public finance accounted for the remaining 2 per cent, most of which was channelled through multilateral development finance institutions. Private-sector capital flows in adaptation finance were thus negligible.

Existing capital flows need to be scaled up substantially for India to meet its climate ambitions. Achieving net-zero emissions by 2070 requires an average annual investment of USD 450 billion (NITI Aayog 2026) in climate mitigation over the 45-year period leading up to 2070, implying 9x of current levels. In the case of adaptation, India requires investments of ~USD 100 billion per year through 2030, necessitating an increase in flows to six- to seven-times of current levels. In this context, private capital will play a critical role in achieving climate action. To illustrate, the International Monetary Fund (IMF) projects limited growth in public climate investment across EMDEs (excluding China) and estimates that private capital would need to account for ~90 per cent of annual climate mitigation investment needs by 2030 in these countries (IMF 2023). From India's perspective, scaling climate capital flows to levels commensurate with its ambitions therefore requires both expanding overall climate-aligned capital flows and increasing the share of private-sector flows.



Understanding financing bottlenecks

Elevating capital flows to the required levels will necessitate interventions that systematically address financing bottlenecks. To further this objective, the Council on Energy, Environment and Water (CEEW) conducted interactions with key stakeholders, primarily from the private sector. Stakeholders were selected to ensure balanced representation across three categories: lenders, funds and other stakeholders. Discussions were tailored to each stakeholder depending on the category and focused on eliciting views on both financing barriers and potential enabling conditions.

Findings of these stakeholder discussions, supplemented by CEEW's analysis, were synthesised into a structured framework for mobilising private-sector finance. To enhance its usability as a policy reference tool, this framework is presented as a simplified 3×3 matrix. Along one dimension, all financing challenges are grouped into three categories: (a) flow, (b) cost, and (c) scale. Along the other, all solutions are organised into three categories: (a) instruments, (b) institutions, and (c) policies and regulations. Each instrument or policy/regulation has been paired with an institution that is best-suited to anchor it. This framework is designed to facilitate targeted, challenge- and sector-specific solutions across power, industry, road transport, and adaptation, rather than broad, overarching solutions.



Image: iStock

Table ES1. Framework for the mobilisation of private finance for climate investments

Sector	Sub-sector	Financing challenge		Solutions		
		Type	Description	Instrument	Institution	Policies and regulations
Mitigation						
Power	Renewable energy (generation)	Scale	Conventional financing sources are insufficient due to emerging headroom constraints	NaBFID Carve-out for RE in NaBFID’s proposed partial credit enhancement (PCE) facility	PFRDA/IRDAI Mandate minimum allocation to green bonds for regulated entities	RBI Fully accessible route (FAR) designation for corporate green bonds
		Flow	Unsigned power sales agreements with state discoms	BEE Monitor states’ compliance under newly notified Renewable Consumption Obligation (RCO) regime	REIA + states Closer coordination on demand prior to floating tenders	
			Timely availability of transmission connectivity data			CEA + PGCIL Real-time transmission connectivity updates
	Compliance with the land and right-of-way requirements of the RBI (Project Finance) Directions, 2025, is perceived to be onerous	RBI Monitor the pace of RE loan disbursements by mandating disclosure of all RE loan portfolios, not just those covered by priority sector lending (PSL)				
Battery energy storage systems (BESS)	Cost	Finance is available but on inferior terms due to limited technology performance track record	A dedicated NGFI Guarantees to improve the terms of finance	MoF Integrate BESS into India’s upcoming climate finance taxonomy		
Industry	Green hydrogen (domestic)	Flow	Commercial viability relative to conventional alternative	MoEFCC Facilitate implementation of cross-border Article 6 deals for GH2/ammonia projects	A dedicated NGFI Concessional equity to unlock the potential of GH2 on a project basis	IFSCA In addition to eligible taxonomies, integrate CCTS into Framework for Transition Bonds to widen coverage of end-use sectors
				MNRE/MoPNG/MoC&F Demand-side mandates, such as hydrogen purchase obligations		
	Green hydrogen (international)	Flow	Limited domestic conversion infra (hydrogen → ammonia) for exports	MNRE/MoPNG/MoPSW Boost conversion infrastructure		

Sector	Sub-sector	Financing challenge		Solutions		
		Type	Description	Instrument	Institution	Policies and regulations
Mitigation						
Road transport	Electric vehicles	Cost	Finance is available but on inferior terms due to concerns over (i) lifetime battery performance (ii) absence of a vibrant secondary market for EVs	A dedicated NGFI Guarantees to mitigate risk perceptions and support the establishment of a loan performance track record Department of Science and Technology (DST) + OEMs + battery manufacturers Battery performance tracker leveraging proposed Battery Pack Aadhar System OEMs + battery manufacturers Integrating battery performance tracker into EV buyback schemes		
Adaptation						
Cross Sectoral		Flow	More clarity needed on what qualifies as adaptation		MoF Finalise and release climate finance taxonomy	
			Lack of revenue streams and/or business models	A dedicated NGFI Focus on cross-cutting projects (adaptation and mitigation) and devise innovative public-private partnership (PPP) business models		
			Challenges in municipal financing	Municipal corporations Adopt Reform Identify Strengthen and Engage (RISE) framework for issuance of municipal bonds	PFRDA/IRDAI Demand side mandates for regulated entities, complementing existing and proposed supply side interventions by MoHUA	
			The financing ecosystem needs to evolve to meet the adaptation finance challenge	Development finance institutions (DFIs) Lines of credit routed through commercial banks with amounts earmarked for climate adaptation	SEBI Shift adaptation measures to essential indicators instead of the current specification under leadership in BRSR	RBI Shift disclosure requirements pertaining to adaptation that feature under 'enhanced' to 'baseline' under the Draft Climate-related Financial Risk Disclosures

Source: CEEW-GFC stakeholder consultations and authors' analysis

1. Introduction

Accelerating global climate action is critical to limit temperature rise and foster climate resilience, consistent with the objectives of the Paris Agreement. This requires substantial investment in hard physical assets that support emissions mitigation, including solar panels, wind turbines, electric vehicles (EVs), charging infrastructure, and electrolyzers. It also entails investment in physical assets, such as heat-resistant roofs, coastal embankments, storm shelters, and sanitation systems, alongside non-infrastructure approaches, such as community engagement and knowledge sharing, to build resilience. These hard-physical assets are capital-intensive and typically well suited to being majority debt-financed. For example, debt accounts for ~75 per cent of the capital expenditure of solar and wind power plants (Dutt et al. 2021). As a result, adequate and affordable finance is a critical enabler of climate action, particularly in EMDEs. Yet, despite accounting for ~25 per cent of the global gross domestic product (GDP), these countries (excluding China) account for less than 15 per cent of global climate finance flows (Stewart et al. 2024).

The *Fourth Report of the Independent High-Level Expert Group (IHLEG) on Climate Finance* estimates that EMDEs (excluding China) will need to invest USD 3.2 trillion annually by 2035 in climate and nature to meet the goals of the Paris Agreement (Bhattacharya et al. 2025). It estimates that ~60 per cent of this requirement (USD 1.9 trillion) will need to be mobilised from domestic sources, with the remaining ~40 per cent (USD 1.3 trillion) being sourced externally (ibid).

Although the finance mobilised from both domestic and external sources will comprise a mix of public and private capital, the role of private capital will be particularly important. The IHLEG estimates that private finance flows from domestic and external sources would need to increase by 9-fold and 16-fold, respectively, from current levels to meet annual investment needs by 2035 (Bhattacharya et al. 2025).

Constraints on public capital in both domestic and international contexts could limit mobilisation from these sources. In EMDEs, the fiscal space for climate action may be limited by the need to service elevated sovereign debt and fund competing development priorities. In the international context, developmental aid from the developed world is expected to decline by 9–17 per cent in 2025, following the 9 per cent decline in 2024 (OECD 2025).

In this context, India's climate ambitions also require large-scale investment. Achieving net-zero emissions by 2070 will require investments of ~USD 10 trillion to decarbonise the power, road transport, and industry sectors, which collectively account for ~70 per cent of India's greenhouse gas (GHG) emissions, over the 50-year period leading to 2070 (Singh and Sidhu 2021). More recently, NITI Aayog, in a report released in February 2026, which followed a different set of assumptions, estimates that India will require ~USD 22.7 trillion for decarbonising these sectors. In the near term, decarbonising these sectors represents a ~USD 500 billion investment and sales opportunity by 2030.¹ Furthermore, India will need to invest ~USD 700 billion by 2030 in climate adaptation to build resilience (MoEFCC 2023a).

Mobilising private finance at scale is essential to meet these investment requirements. Policy and regulation play a critical role in creating enabling conditions for the flow of private capital, and India has achieved notable progress in this regard. Around 66 per cent of India's climate mitigation flows – USD ~50 billion annually – has been sourced from the private sector. However, both the share of private finance in mitigation flows and the overall scale of capital flows must increase to meet India's net-zero ambitions. Climate adaptation, by contrast, has been funded predominantly through public sources, with negligible private-sector participation. Introducing, and then increasing private investment in the adaptation finance mix would help build a climate-resilient economy.

1. CEEW-GFC analysis based on Singh et al. (2020a, 2020b) and Gol (2023).

This policy brief aims to identify measures to accelerate India's transition to a climate-resilient, low-carbon economy by scaling private capital flows. It develops a framework, informed by market perspectives, to identify the instruments, institutions, and policy and regulatory measures that must operate in tandem to enable private capital to flow at scale and at an affordable cost. Each instrument or policy/regulation has been paired with an institution best suited to anchor it. The framework is designed to arrive at pinpointed solutions to specific challenges pertaining to each specific sector (power, industry, road transport, and adaptation), rather than broad, overarching solutions, which may apply across sectors. This framework aims to provide an analytical basis for policymaking that unlocks higher levels of capital flows consistent with India's climate

ambitions, a strategy that could be replicated by other EMDEs to address similar financing challenges.

The study follows a structured approach to develop this framework, combining stakeholder consultation and secondary research. It begins by analysing existing sectoral and cross-cutting policies and regulations that have enabled the current levels of capital flows. It then presents a sectoral analysis of climate mitigation finance flows and a broad analysis of climate adaptation financing in the Indian context. The study subsequently systematically identifies the barriers to higher levels of capital flows. Since the objective is to maximise private-sector flows, this portion of the analysis draws on stakeholder consultations, primarily with the private sector.

2. Policy and regulatory review

India has adopted a multifaceted approach to developing an enabling investment environment that facilitates climate finance flows, particularly from the private sector. This includes sectoral policies across both mitigation and adaptation, as well as cross-cutting levers that apply to both. This section summarises the key sectoral policies across major mitigation sectors and climate adaptation, as well as cross-cutting levers that support India's broader green finance ecosystem.

2.1 Mitigation

The power (39 per cent), road transport (9 per cent), and industry sectors (23 per cent) collectively account for ~70 per cent of India's GHG emissions, according to India's *Fourth Biennial Update Report* (BUR-IV) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) (MoEFCC 2024). The deployment of renewable energy (RE), electric mobility, and GH2 drives decarbonisation across these three sectors. A review of the policy landscape reveals that these policies can be categorised into key themes:

- **Target setting:** Sectoral targets for deployment provide direction for policymaking and act as advance commitments to the market on the availability of project pipelines. The following targets apply to the various sectors:
 - Power (renewables): The overarching target is 500 GW of non-fossil-fuel-based installed capacity by 2030 (MoP n.d.a.).
 - The target is also complemented by sub-targets for decentralised RE over different timelines, these include 40 GW of solar rooftop and ~34.8 GW of solar pumps and agricultural feeders under the *Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM)* by 2026 (MNRE n.d.c.; PIB 2024b).
 - A year-wise bidding trajectory for utility-scale RE from FY24– to FY28 that specifies the capacity renewable energy implementing agencies (REIAs) plan to auction, with a separate minimum allocation for wind power. Such granularity can facilitate investment planning by investors (PIB 2023b).
 - Under the *Revamped Distribution Sector Scheme (RDSS)*, India aims to replace 250 million conventional meters with smart, prepaid meters by 2025–26 to improve discom finances, reduce aggregate technical and commercial (AT&C) losses, enhance billing efficiency, and empower consumers with real-time consumption data (Prayas [Energy Group] 2025).
 - Industry (GH2): India's *National Green Hydrogen Mission* targets 5 million metric tonnes per annum (MMTPA) of GH2 production by 2030, potentially rising to 10 MMTPA with growth of export markets (Gol 2023).
 - Road transport (EVs): India has not formally specified an EV target. However, the Government of India (Gol) has set a target of achieving 30 per cent EV penetration by 2030, aligned with the global EV30@30 initiative (PIB 2025d). NITI Aayog has also periodically outlined EV penetration ambitions. In 2019, it envisioned differentiated penetration across categories by 2030: 80 per cent for two- and three-wheelers, 40 per cent for buses, 70 per cent for commercial cars, and 30 per cent for private cars (NITI Aayog and RMI 2019).
- **Procurement transparency:** Tendering and deployment of capacity through competitive reverse auctions have helped create transparency in price discovery and procurement across the RE, electric mobility (for electric buses), and GH2 sectors.
- **Demand certainty:** Policies creating greater certainty over uptake facilitate investments.
 - Power (renewables): Renewable purchase obligations require discoms and other obligated entities to source a minimum share of RE in their annual power procurement according to a specified trajectory.
 - Guidance from the Ministry of Power (MoP) requires this minimum share to rise to 43.33 per cent by 2030, though each state is supposed to separately determine this trajectory for its jurisdiction in line with the MoP's guidance (MoP 2023).
 - Road transport (EVs): Consumer incentives for various categories of EVs offered under the *Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME)* scheme and its successor, PM E-DRIVE, create greater certainty over uptake.
- **Supporting infrastructure:** Complementary infrastructure is necessary to support the deployment of various low-carbon technologies.
 - Power (renewables): Solar park schemes offer readily available land and evacuation infrastructure to RE developers in exchange for a fee (MNRE n.d.a.). The Green Energy Corridor has developed a dedicated transmission network to connect generation sources with load centres. This facilitates the integration of RE generation into the grid (MNRE n.d.b.).

- Industry (GH2): The *National Green Hydrogen Mission* aims to promote the development of GH2 hubs capable of supporting large-scale production and utilisation of hydrogen. Budgetary support of INR 200 crore is allocated by 2026 for at least two hydrogen hubs (MNRE 2024a). Policies that envision support for the development of transportation and storage infrastructure for GH2 are also in place.
- Road transport (EVs): The central government's PM E-DRIVE scheme offers INR 2,000 crore in incentives to support the deployment of public EV charging infrastructure (MHI 2024).
- **Mitigating offtaker risk:** Offtaker risk pertaining to contracts involving state government-owned counterparties is mitigated through contracting structures in which intermediation by central government entities offers some form of payment security.
 - Power (renewables): Central government entities, known as REIAs – Solar Energy Corporation of India (SECI), National Thermal Power Corporation (NTPC), National Hydroelectric Power Corporation (NHPC), and Satluj Jal Vidyut Nigam (SJVN) – sign power purchase agreements (PPAs) with RE developers and subsequently enter into back-to-back power sale agreements with state discoms. Some of these central government entities, such as SECI (through its payment security mechanism and a tripartite arrangement between the central government, the Reserve Bank of India [RBI], and the state government) and NTPC (through a tripartite agreement), offer payment security that mitigates offtaker risk pertaining to state discoms.
 - Industry (GH2): A similar contracting structure as RE has been adopted, under which SECI anchors demand and signs long-term offtake agreements. A GoI-backed payment security mechanism (PSM) is also committed to de-risk potential payment delays from procurers (PIB 2025c).
- Road transport (EVs): The payment security mechanism under the PM-eBus Sewa mitigates offtaker risk for private operators of e-buses under the gross cost contract mode with state transport undertakings as counterparties (MoHUA 2023).
 - This scheme aims to support the deployment of over 38,000 e-buses across India between FY25 and FY29, with operational support for up to 12 years from the date of deployment (ibid).
- **Financial incentives:** Targeted incentives facilitate deployment across sectors.
 - Power (renewables): Viability gap funding (VGF) schemes support the deployment of (i) 4,000 MWh of battery energy storage systems (INR 9,400 crore), (ii) 12,000 MW solar projects under the *Central Public Sector Undertaking (CPSU) Scheme Phase-II* (INR 9,400 crore), and (iii) 1 GW of offshore wind (INR 7,453 crore). Central financial assistance (CFA) under PM-Surya Ghar (INR 75,021 crore) for rooftop solar and PM-KUSUM (INR 34,422 crore) for solar pumps and agricultural pump solarisation is also available. An inter-state transmission system (ISTS) waiver is also provided for wind power and battery energy storage system (BESS) projects (MNRE 2025).
 - Industry (GH2): The *Strategic Interventions for Green Hydrogen Transition* (SIGHT) programme provides INR 13,050 crore over three years for GH2 and green ammonia production (MNRE 2024b). An ISTS waiver is also extended to RE-based GH2 and ammonia production units.
 - Road transport (EVs): The PM E-DRIVE scheme (2024–26) provides per unit incentives (INR 3,679 crore) for the purchase of EVs (MHI 2024).
- **Fiscal incentives:** These include concessional rates of goods and services tax (GST) for EVs. Consumers benefit from a reduced GST rate of 5 per cent on EVs, along with a partial or full exemption from registration fees and road tax under state EV policies.

- **Carbon market:** The *Carbon Credit Trading Scheme* (CCTS) is expected to become operational in 2026 (BEE 2025). The CCTS specifies trajectories based on emissions intensity to advance the decarbonisation of nine industrial sectors. Presently, the following sectors are covered, with obligated entities identified in each: aluminium (16 obligated entities), chlor-alkali (30), cement (186), fertiliser (NA), iron and steel (253), pulp and paper (53), petrochemicals (11), petroleum refining (21), and textiles (173). Furthermore, obligated entity-specific emissions intensity targets were released in May–June 2025.

- *National Mission for a Green India*
- *National Mission for Sustainable Agriculture*
- *National Mission on Strategic Knowledge for Climate Change*
- Health (added as a new mission to develop the National Action Plan on Climate Change and Health)

Of these, the first three missions focus on mitigation, while the remaining six emphasise adaptation and/or adaptation co-benefits across sectors, including agriculture, water, forestry, health, and the Himalayan ecosystem (PIB 2024a). The subject of these six missions aligns closely with the key sectors specified in India's TNC-IAC to the UNFCCC.

2.2 Adaptation

From a climate adaptation perspective, India's *Third National Communication and Initial Adaptation Communication* (TNC-IAC) to the UNFCCC highlights seven key sectors: agriculture, water, forestry and biodiversity, coasts and islands, the Himalayan ecosystem, disaster management, and health. Policymaking on climate adaptation operates across multiple dimensions.

- **National Action Plan on Climate Change (NAPCC):** India's overarching framework for climate action, the NAPCC, serves as the central pillar of India's adaptation strategy. Its components include national programmes to address climate change adaptation and enhance the ecological sustainability of development (MoEFCC 2021). The NAPCC encompasses nine missions in total:
 - *National Solar Mission*
 - *National Mission for Enhanced Energy Efficiency*
 - *National Mission on Sustainable Habitat*
 - *National Water Mission*
 - *National Mission for Sustaining the Himalayan Eco-system*
- **National Adaptation Fund for Climate Change (NAFCC):** The NAFCC was established in 2015 to support adaptation activities at the state and union territory (UT) level. To date, 30 projects across 27 states and UTs have been approved, with a total sanctioned project cost of INR 847.48 crore (PIB 2024d).
- **State action plans on climate change (SAPCCs):** To facilitate climate action at the state level, states are advised to submit their respective SAPCCs. These plans are aligned with the NAPCC but are tailored to address specific regional issues relating to climate change. The SAPCCs identify local climate impacts and integrate corresponding measures across relevant sectors into state-level policies and programmes (MoEFCC 2023a). As of December 2024, 34 states/UTs have developed their own SAPCCs.

India's National Action Plan for Climate Change (NAPCC) serves as the overarching framework for policy interventions pertaining to adaptation.

- **Heat action plans (HAPs):** These plans are guidance documents prepared by state, district, and city governments to support preparedness, response, recovery, and learning in relation to heatwaves. A key function is to direct scarce healthcare, financial, information, and infrastructure resources to those most vulnerable to extreme heat within the jurisdiction. The India Meteorological Department (IMD), in collaboration with the National Disaster Management Authority (NDMA) and local health departments, has facilitated the development of HAPs across many regions of the country to forewarn about heatwaves and provide guidance on actions to be taken during such events. The NDMA and IMD are working with more than 23 states and over 130 cities to prepare their HAPs (Prabhu, Shravan 2023)
- **Financial incentives for municipal bonds:** The *Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 2.0* scheme, launched in 2021, incentivises the issuance of municipal bonds, including green bonds. Monetary incentives are provided to municipal corporations for raising both conventional and green bonds (MoHUA 2025). Many municipal bond issuances (~58 per cent) cater to adaptation-relevant end uses (Bibhudatta and Rathee 2025), indicating that such incentives for municipal bonds can indirectly facilitate greater capital flows towards adaptation.
- **Schemes with adaptation-related co-benefits:** The central government implements several development programmes that contribute to adaptation, either directly or through climate co-benefits. Some of these include:
 - *Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI)*: Launched in 2023 to conserve mangrove ecosystems for preventing coastal erosion. The tentative proposed cost is INR 1,250 crore for conservation and restoration of 540 sq km in states and UTs (PIB 2024c).
 - *Atal Bhujal Yojana*: Launched in 2019 to address the escalating issue of groundwater depletion and ensure its long-term sustainability (PIB 2020), with an outlay of INR 6,000 crore over the period 2021–25 (ibid.)
 - *Jal Jeevan Mission (JJM)*: Launched in 2019 to provide tap water supply to every rural household, with a budget outlay of INR 67,000 crore till 2028 (PIB 2025a).

2.3 Cross-cutting levers

Beyond sector-level mitigation policies and broader adaptation policies, Indian policymakers and regulators have implemented several cross-cutting levers to facilitate climate capital flows. The key initiatives are summarised as follows:

- **Sovereign Green Bond Framework:** The Ministry of Finance (MoF) released India's Sovereign Green Bond Framework, covering nine eligible categories, including RE, clean transportation, sustainable water and water management, and climate adaptation (DEA 2022).
- **Foreign direct investment (FDI) up to 100 per cent:** The GoI allows up to 100 per cent FDI in the RE, automotive, and GH2 sectors under the automatic route.
- **Green Deposit Framework:** The RBI has introduced a framework enabling banks to accept green deposits. Green deposits are interest-bearing deposits earmarked for use by banks in financing green finance. The RBI has also specified sectors under which green deposits may be used, including RE, clean transportation, and biodiversity conservation (RBI 2023).

- **Business Responsibility and Sustainability Reporting (BRSR):** The Securities and Exchange Board of India (SEBI) – India’s capital markets regulator – introduced the BRSR framework in 2021, mandating the top 1,000 listed companies to disclose their environmental, social, and governance (ESG) performance (Dubey 2024).
- **Framework for green bonds:** The Securities and Exchange Board of India updated its green debt securities framework in line with the Green Bond Principles by the International Capital Market Association (ICMA). The update also introduced blue and yellow bonds for sustainable water management and funds raised for solar energy generation, respectively (SEBI 2023).
- **International Financial Services Centres Authority (IFSCA):** India’s international financial regulator for institutions situated in GIFT-IFSC has introduced various sustainable finance initiatives. These include a loan asset mandate for bank units to allocate at least 5 per cent of their loans to sustainable activities (PIB 2023a). In May 2025, IFSCA also issued a consultation paper titled ‘Framework for Transition Bonds’ for public consultation (IFSCA 2025), proposing eligible activities, trajectories, independent external reviews, and disclosures.
- **Article 6:** Article 6 of the Paris Agreement provides a framework for countries to cooperate towards implementing their Nationally

Determined Contributions (NDCs) through carbon markets (Articles 6.2 and 6.4) and non-market modalities (Article 6.8). India has finalised a list of activities eligible for carbon credit trading under bilateral and cooperative approaches (MoEFCC 2023b). Moreover, India has signed a memorandum of cooperation (MoC) with the Government of Japan on the Joint Crediting Mechanism (JCM) under Article 6.2 of the UNFCCC Paris Agreement (PIB 2025b).

- **Priority sector lending:** The RBI has included RE and other climate-relevant sectors, such as agriculture, under priority sector lending (PSL) categories to ensure adequate flow of credit from the banking system to sectors critical for socio-economic development (RBI 2025).

In addition, several cross-cutting levers are currently in draft form. These include (i) a draft Framework of India’s Climate Finance Taxonomy, released by the MoF for public consultation (MoF 2025), which is expected to specify climate-aligned activities and projects; and (ii) a framework for the disclosure of climate-related financial risks by lenders, applicable to specific RBI-regulated entities (RBI 2024).

In this review of sectoral and cross-cutting policies and regulations that promote finance flows for both mitigation and adaptation, it is important to understand the scale and nature of these flows. The following section examines this in detail.

3. Climate finance flow analysis

India's dual commitment to achieving net-zero emissions by 2070 and building resilience against worsening climate impacts necessitates an unprecedented mobilisation of finance. The scale and urgency of the investment required to meet both mitigation and adaptation goals underscore the centrality of finance in India's climate strategy.

Mitigation finance needs: In the near term (2030), specific capacity targets have been set for various technologies that are central to the decarbonisation across the three key mitigation sectors – power, industry, and road transport. Over the long term (2070 net-zero), modelling reveals specific capacity scenarios for these technologies. Near-term investment requirements amount to hundreds of billions of dollars, whereas long-term requirements exceed trillions. Table 1 provides additional details.

Table 1. Summary of near- and long-term targets and scenarios with respective financing requirements

Sector	Near term (2030)		Long term (2070) (CEEW)		
Power (renewables)	Target capacity (source)	Investment requirement (source)	Modelled capacity scenarios		Investment requirement
	500 GW non-fossil (announced at COP26)	USD 200 bn (CEEW)	Coal	2040 peak, 0% by 2060	USD 8,412 bn
			Solar	5,630 GW	
			Wind	1,792 GW	
			Nuclear, hydro, etc	~300 GW	
Others	Transmission and distribution (T&D), storage, etc				

Sector	Near term (2030)		Long term (2070) (CEEW)		
Industry (GH2)	5 MMTPA	USD 100 bn	Coal	2040 peak, 0% by 2065	USD 1,494 bn
	(National Green Hydrogen Mission)	(National Green Hydrogen Mission)	Hydrogen	19% share in industrial energy use	
Road transport (EVs)		USD 206 bn (sales)	EVs (% of car sales)	84%	USD 198 bn
	Differentiated penetration levels per category (NITI Aayog)	USD 12 bn (battery)	EVs (% of freight truck sales)	79%	
		USD 3 bn (charging)			
		(CEEW)			
Total		~USD 500 bn			~USD 10,000 bn

Source: CEEW-GFC compilation based on multiple sources

Adaptation finance needs: Adaptation finance needs are equally urgent. India's communication to the UNFCCC, TNC-IAC, estimates cumulative adaptation expenditure of INR 56.68 trillion (~USD 700 billion) under a business-as-usual (BAU) scenario through 2030 (base year 2023–24). This expenditure is required to enhance adaptive capacity

and build resilience across the following sectors: agriculture, water supply and sanitation, housing, health, education, poverty alleviation, forestry and wildlife, and disaster management. This corresponds to ~INR 8 trillion (~USD 100 billion) per year over the seven-year period.⁶

3.1 Current landscape of climate finance flows in India

Climate finance in India is evolving rapidly but remains uneven across sectors and financing types. While mitigation-related finance, particularly in clean energy and electric mobility, is increasingly attracting private capital, adaptation finance remains dominated by public sources.

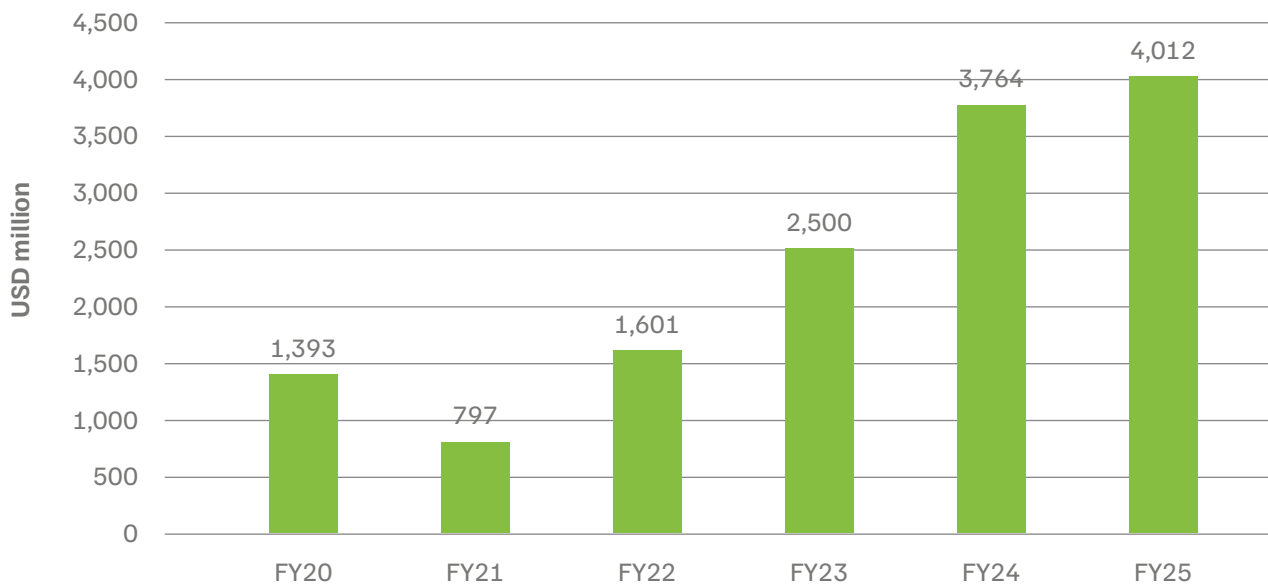
Mitigation finance

Mitigation finance in India varies across sectors, reflecting differences in technological maturity, market development, and policy support. The landscape across the three key sectors is summarised as follows:

Power (renewables): Banks and non-banking financial companies (NBFCs) remain the primary

sources of debt finance for deployment. Private entities typically secure project-level debt, whereas public sector undertakings (PSUs) usually raise debt on the strength of their balance sheets through borrowings from banks and NBFCs as well as the corporate bond market. On the equity side, FDI up to 100 per cent is permitted in RE. Several institutional investors, such as sovereign wealth funds, pension funds, and private equity firms, have invested in India-focused RE development platforms. Prominent sovereign wealth and pension fund investors include those from Canada, Europe, the Middle East, and Singapore. Private equity investment has also attracted significant participation from the United States (US), Japan, and Southeast Asia. Additionally, public equity markets have also served as a route for capital inflow, primarily from domestic institutional investors.

Figure 1. Foreign direct investment in non-conventional energy



Source: CEEW-GFC compilation based on data from the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry

Road transport (EVs): In electric mobility, NBFCs have historically played a dominant role in financing EV purchases, similar to their role in financing conventional vehicles. However, banks are increasingly entering this space, often through strategic partnerships with original equipment manufacturers (OEMs). Leasing has also emerged as a viable financing route for fleet operators, often facilitated by specialised financing entities. In addition, public–private partnerships (PPPs) are increasingly being explored by the government to support the deployment of electric bus fleets.

Industry (GH2): In emerging areas, such as green hydrogen, financing is currently concentrated among large corporations and PSUs. These entities, due to their financial strength, are financing pilot projects and early capacity additions on the strength of their balance sheets, rather than relying on project finance structures. In several instances, private developers have partnered with PSUs to jointly develop GH2 projects.

Adaptation finance

Adaptation finance in India is predominantly channelled through public sources, reflecting the close alignment of adaptation interventions with broader development priorities, such as health, water, sanitation, and urban civic services.

As discussed previously, the NAPCC forms the central pillar of India’s adaptation strategy. Its components include national programmes aimed at addressing the challenge of adapting to climate change and enhancing the ecological sustainability of development.

Beyond the NAPCC, states have prepared their respective SAPCCs. While aligned with the NAPCC, these plans are tailored to address region-specific climate change issues. The SAPCCs primarily focus on adaptation and afforestation rather than mitigation, focusing on sectors such as agriculture, water, health, forests, and coastal, reflecting state-specific climate impacts.

At the urban local level, municipal corporations also play a role in financing adaptation infrastructure projects, including investments in water treatment and sewage infrastructure. These investments are often financed through their own revenue sources, or through grants from the centre and states. Further, instruments such as municipal bonds – specifically municipal green bonds – are gaining traction. According to a CEEW report, Indian municipal corporations have issued 17 bonds since 2015, raising ~INR 2800 crore (USD 350 million), largely for climate-aligned end uses. The report also notes that four of the seven most recent municipal bonds were labelled green (Bibhudatta and Rathee 2025).

3.2 Tracking India's climate finance flows

Tracking climate finance is inherently complex exercise due to multiple definitions, overlaps between adaptation and development projects, and limited comprehensive reporting across sources of climate finance.

Nevertheless, various agencies and organisations track climate finance using distinct methodologies, standards, and definitions. These include the Climate Policy Initiative (CPI), the International Energy Agency (IEA), the Climate Bonds Initiative (CBI), and the Organisation for Economic Cooperation and Development (OECD). However, their reports often vary in scope, definitions, and coverage.

Among these sources, CPI's report, *India Landscape of Green Finance 2024*, offers the most comprehensive analysis of India's climate finance flows and their

tracking mechanisms, presenting them as the average for 2021–22 (CPI 2024). Accordingly, the analysis in this section draws on that report. The report itself categorises climate finance flows into mitigation and adaptation. On the mitigation side, flows are tracked across three sectors: clean energy, energy efficiency, and road transport. On the adaptation side, finance flows are tracked across four sectors: disaster risk management, flood and cyclone mitigation, drought management, and agriculture (on-farm adaptation-related activities).

Climate finance flows: mitigation

India's mitigation finance is growing rapidly. The average annual amount of mitigation finance for 2021–22 reached USD 50 billion, a 20 per cent increase from the 2019–20 average.

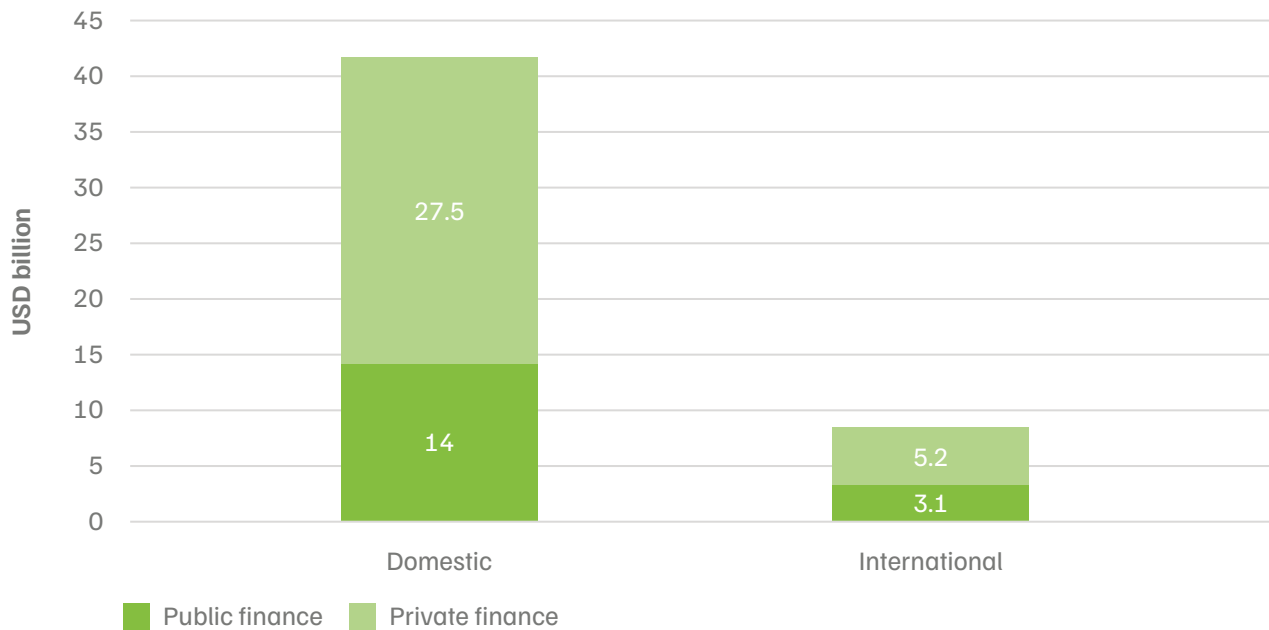
Finance from where and of what type: mitigation

Of the average annual mitigation finance flows in 2021–22, the majority – 83 per cent (USD 41.5 billion) – was sourced domestically, highlighting the critical role of Indian institutions in funding India's net-zero transition.

Within domestic sources, the private sector contributed nearly two-thirds (66 per cent), amounting to ~USD 27.5 billion, while public sources accounted for the remaining 34 per cent (USD 14 billion), primarily through central and state government budgetary allocations and PSUs.

International sources accounted for USD 8.3 billion, of which 63 per cent (USD 5.2 billion) originated from private investors, with the remainder coming from public sources.

Figure 2. Mitigation finance: Domestic private investment takes the lead (average annual 2021–22)



Source: CEEW-GFC analysis based on CPI (2024)

Finance for what: mitigation

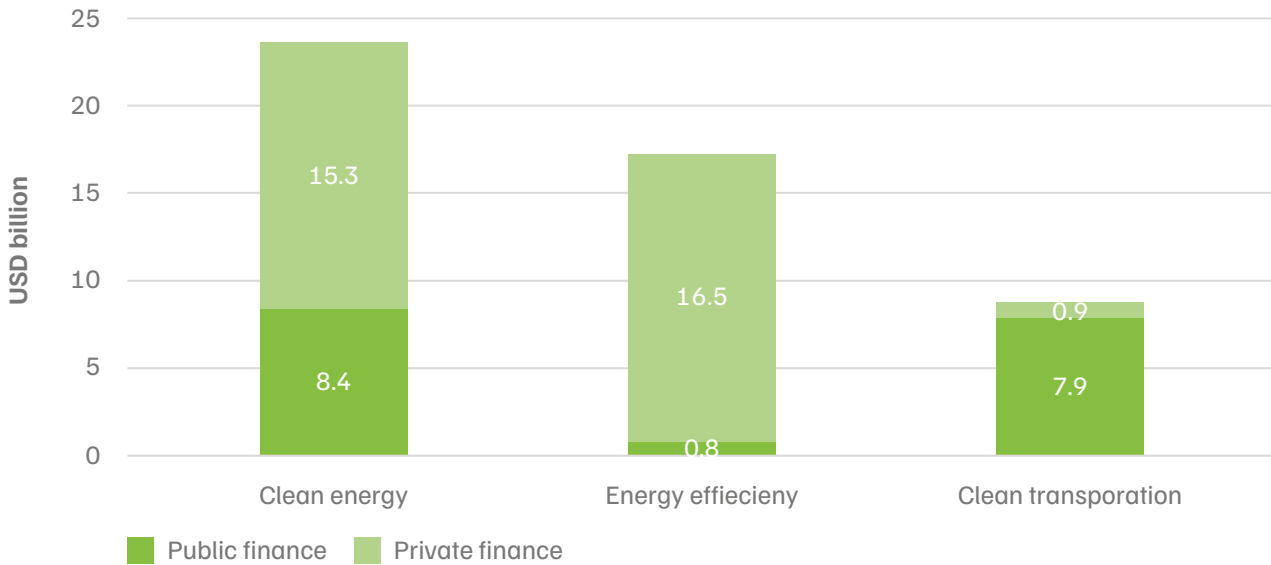
Among the tracked mitigation sectors, clean energy attracted the largest share of finance, amounting to USD 23.7 billion (47 per cent). This was followed by energy efficiency at USD 17.3 billion (35 per cent) and clean transportation at USD 8.8 billion (18 per cent).

Clean energy was financed predominantly through private sources, which contributed USD 15.3 billion. Of this, domestic private investors accounted for

USD 10.1 billion, while international private investors contributed USD 5.2 billion. Public-sector contribution to clean energy amounted to USD 8.4 billion.

In contrast, energy efficiency was financed almost entirely by the private sector, primarily by domestic investors, who contributed USD 16.5 billion. Meanwhile, clean transportation finance was largely public, totalling USD 7.9 billion, of which USD 5.9 billion was sourced domestically and ~USD 2 billion from international public finance.

Figure 3. Mitigation sectoral climate finance: Clean energy and energy efficiency lead in private investment (average annual 2021–22)



Source: CEEW-GFC analysis based on CPI (2024)

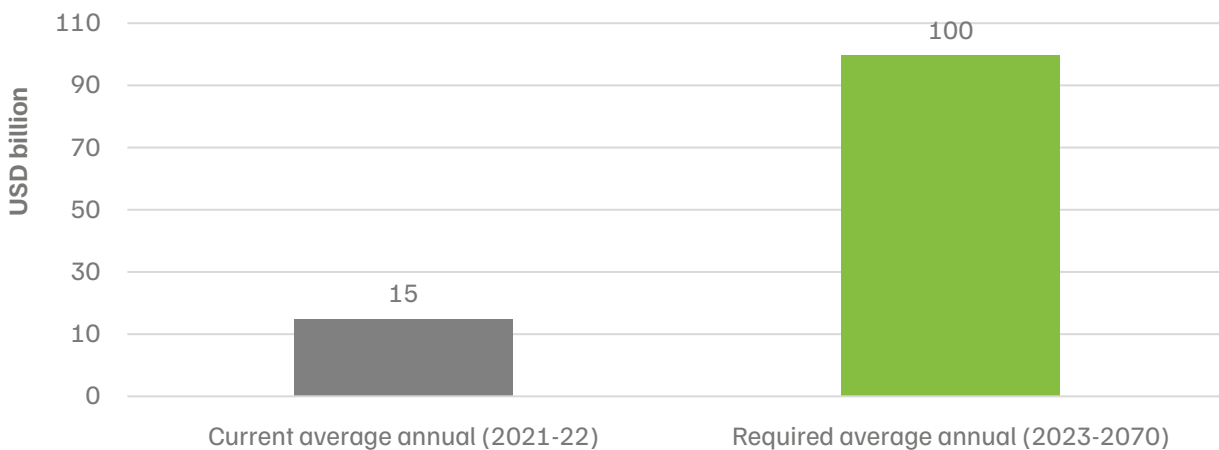
Note: For sub-sectors, refer to the Table A1.

Climate finance flows: adaptation

While adaptation finance remains smaller in scale compared to mitigation, it has grown notably. Between 2019–20 and 2021–22, adaptation-related flows tripled, reaching ~USD 15 billion. However, according to India’s TNC-IAC submitted to UNFCCC,

cumulative adaptation finance requirements are estimated at ~USD 700 billion by 2030 – equivalent to roughly ~USD 100 billion per year. This indicates a significant gap between current financial flows and required expenditure, suggesting that adaptation finance must increase nearly six-fold to meet projected needs.

Figure 4. Adaptation finance: Current flows need to increase six-fold



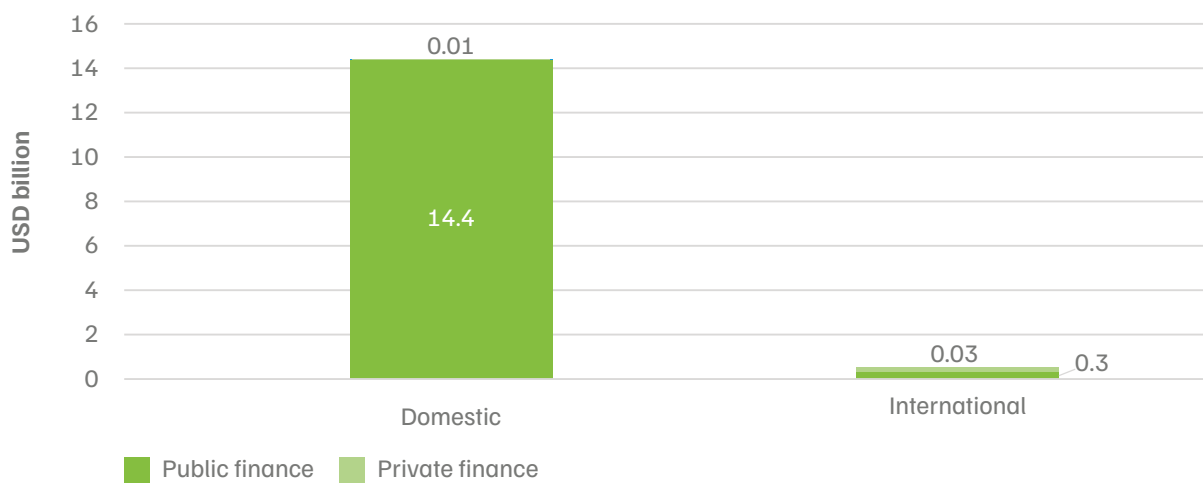
Source: Author’s compilation based on India’s (TNC-IAC) submission to UNFCCC (required average annual) and CPI (2024) (current annual) report

Finance from where and of what type: adaptation

Unlike mitigation finance, which attracts significant private capital, adaptation finance remains overwhelmingly dependent on public sources. An estimated 98 per cent (USD 14.4 billion) of the average annual adaptation finance for 2021–22 originated from domestic public sources, primarily

through central and state government budgetary allocations. Private-sector participation was negligible, with less than USD 0.01 billion mobilised domestically. International public finance accounted for the remaining 2 per cent (USD 0.31 billion), most of which was channelled through multilateral development finance institutions.

Figure 5. Adaptation finance relies almost entirely on domestic public sources (average annual 2021–22)



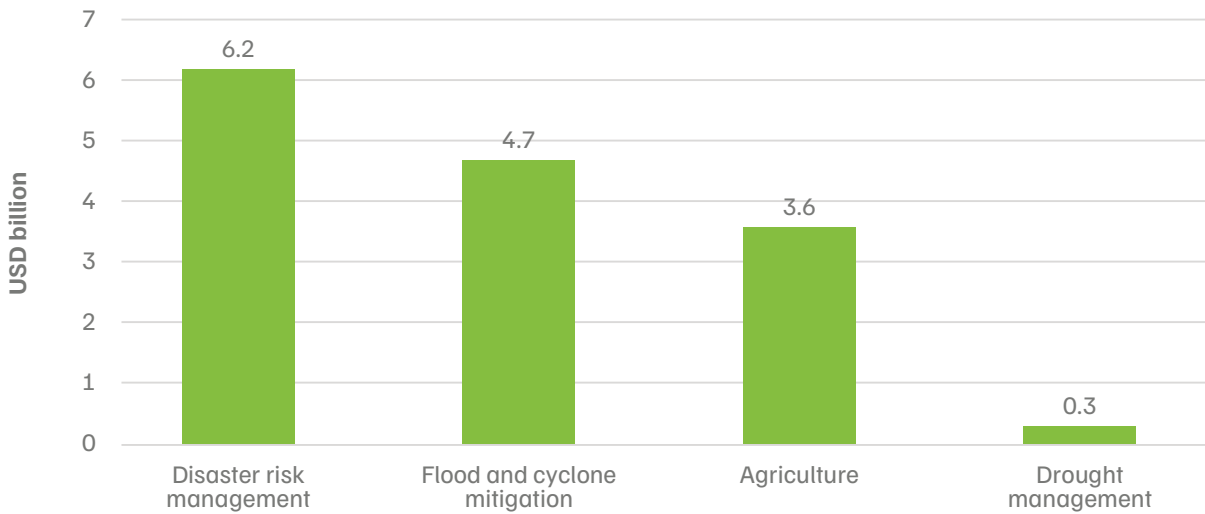
Source: CEEW-GFC analysis based on CPI (2024)

Finance for what: adaptation

Across the four tracked adaptation sectors, disaster risk management received the largest allocation at ~USD 6.2 billion, accounting for 42 per cent of tracked adaptation flows. This was followed by flood and cyclone mitigation, which received 32 per cent (~USD 4.7 billion) of total adaptation funds.

Agriculture – a critical livelihood sector vulnerable to changing rainfall and temperature patterns – received ~USD 3.6 billion, while drought management, another critical priority area, received about USD 0.3 billion.

Figure 6. Tracked adaptation sectors show the highest funding for disaster risk and flood and cyclone management (average annual 2021–22)



Source: CEEW-GFC analysis based on CPI (2024)

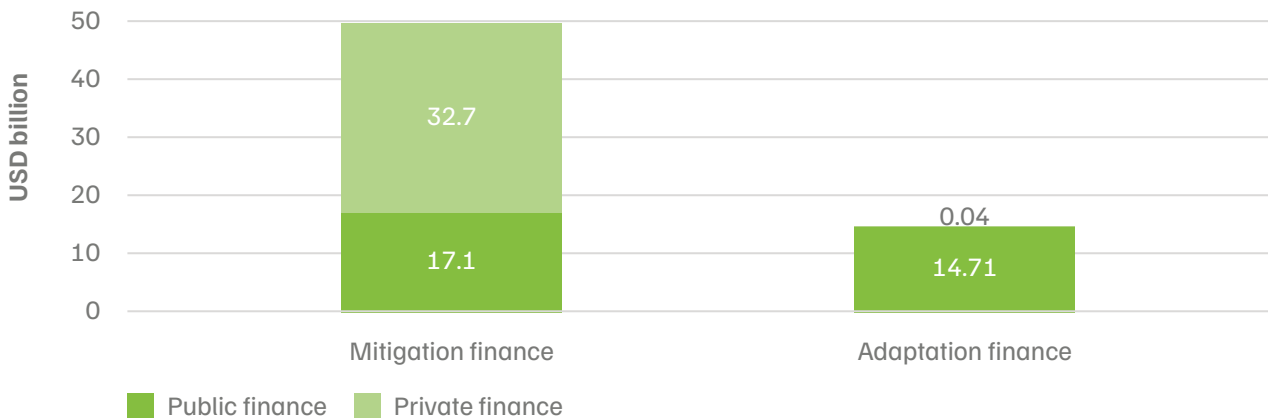
3.3 Why are private finance flows in climate adaptation negligible?

Despite total climate finance flows averaging USD 65 billion in 2021–22, adaptation accounts for only 24 per cent, highlighting a significant gap relative to mitigation finance.

A comparison of public and private contributions further highlights this imbalance. Public finance

levels are broadly comparable between mitigation (USD 17.1 billion) and adaptation (USD 14.71 billion). However, the role of private finance differs markedly. In mitigation, private-sector investment constitutes a substantial share of total flows, whereas in adaptation, private finance remains almost non-existent.

Figure 7. Adaptation finance trails mitigation, with minimal private-sector involvement (average annual 2021–22)



Source: CEEW-GFC analysis based on CPI (2024)

What makes adaptation finance challenging for private players:

1. **Challenging to quantify benefits:** The primary benefits of adaptation are denominated in terms of avoided losses or avoided costs, which are less tangible than direct revenues and profits – the benefits in the case of mitigation. While adaptation investments often generate social and environmental co-benefits (WRI 2019), these are similarly harder to quantify in terms of measurable financial returns.
2. **Bankability challenges:** Most adaptation projects, such as coastal defences, flood management systems, and ecosystem restoration, primarily deliver public goods and infrastructure, which are typically not associated with direct revenue streams. Additionally, many adaptation projects often involve long implementation timelines (10–20 years) and relatively small investment sizes, which may not appeal to institutional investors seeking large-scale investments with short- to medium-term returns (UNFCCC n.d.). As a result, even well-designed adaptation projects struggle to secure private finance.
3. **Geographic specificity:** Adaptation needs and solutions are highly context-specific, varying significantly by location, infrastructure availability, and socio-economic factors (Choi et al. 2022). This lack of standardisation limits scalability and makes it difficult for private investors to replicate successful models across regions. For instance, a district in Rajasthan may prioritise heatwave management, whereas a coastal district would emphasise cyclone and flood mitigation.

4. Insights on financing barriers

This section draws on insights from targeted stakeholder engagements to identify key financial barriers to climate mitigation and adaptation. The engagements were designed to capture diverse perspectives across the climate finance ecosystem, ensuring a balanced and comprehensive understanding of the challenges.

4.1 Stakeholder selection and engagement approach

Stakeholders were selected to ensure balanced representation. Discussions were tailored to each stakeholder category and focused on eliciting views on both financing barriers and potential solutions. A total of nine bilateral consultations were conducted across three categories:

- Lender (banks, NBFCs, and international development financing institutions): 3
- Funds (venture capital funds, mutual funds): 3
- Others (developers, credit rating agencies): 3

4.2 Overview of findings: Financing challenges for climate mitigation

The following sub-sections present a sector-wise assessment of financing challenges in climate mitigation:

Key financing challenges: power sector (RE)

Debt finance for RE could face headroom constraints:

While debt finance remains available on competitive terms for utility-scale RE projects from banks and NBFCs, meeting the debt financing requirements of India's 500 GW non-fossil capacity target would require lenders to significantly scale and extend fresh lending, potentially to levels comparable to their current overall exposure to the power sector. Sectoral and group exposure limits for banks may constrain this process. While corporate bonds can be a viable refinancing channel, these are currently characterised by some limitations. Stakeholders highlighted that, in practice, regulatory guidelines largely constrain investments to AA-and-above ratings (domestic rating scale). Moreover, current maturities in the corporate bond market, including for RE issuances, are typically 3–5 years, whereas the funding requirements of clean energy sectors are usually of a longer duration.

Offtake uncertainty due to unsigned power sales agreements:

Stakeholders highlighted uncertainty arising from delays in the signing of power sales agreements (PSAs) by state discoms following the awarding of capacities to developers at RE auctions conducted by REIAs. As of October 2025, ~42 GW RE capacity remained without signed PSAs (MoP n.d.b.). This likely reflects discom expectations of falling RE tariffs, compounded by delays in transmission connectivity.

Uncertainty regarding the timely availability of transmission connectivity data: Stakeholders identified the need for up-to-date information on the progress of development of transmission connectivity as a key enabler for timely project execution. In practice, opacity on this aspect can complicate project execution.

Potential implications of RBI's Project Finance

Directions, 2025: Stakeholders highlighted two provisions that could affect project implementation (i) the requirement to secure at least 75 per cent of land/right of way for non-PPP infrastructure projects prior to fund disbursement (increased from 50 per cent earlier); and (ii) the requirement that 'all applicable approvals/clearances for implementing/constructing the project are obtained before financial closure'. These conditions may make securing debt finance more challenging.

High cost of finance for energy storage: Stakeholders noted that energy storage remains a relatively nascent sector with a limited empirical track record of technology performance. As a result, debt financing terms for storage projects are often less favourable than those available for pure play RE projects.

Key financing challenges: industry (GH2)

Limited commercial viability relative to conventional

alternative: GH2 is currently not cost-competitive with hydrogen sourced from alternative sources. Further, there are no mandates for any sector to purchase GH2. Together, these factors constrain the domestic market demand for GH2. However, GH2 produced in India is relatively cost-competitive in other parts of the world. Consequently, emerging demand for GH2 produced in India in international markets.

Limited infrastructure for exporting GH2:

For export-oriented projects, GH2 is typically converted to green ammonia for transport. However, both domestic conversion facilities and reconversion infrastructure in destination markets remain limited or absent, constraining the scale-up of export volumes.

Key financing challenges: road transport (EVs)

Elevated financing costs relative to internal

combustion engine (ICE) vehicles: Electric vehicles remain at a relatively early stage of development, with most vehicles yet to complete a full lifecycle on Indian roads. The limited historical performance data creates a significant gap in consumer awareness regarding total cost of ownership, real-world utility, and practical use cases relative to ICE vehicles. Stakeholders highlighted that these uncertainties result in persistently higher interest rates on EV loans and significantly higher insurance premiums than for ICE vehicles.

Absence of reliable residual value benchmarks:

While residual values for ICE vehicles are well established through yellow-book and blue-book data, comparable benchmarks for EVs are still evolving. This uncertainty directly affects buyback policies.

Current OEM buyback schemes incorporate highly

conservative terms, such as very low kilometre caps for commercial fleets and mandatory regular servicing. In practice, these schemes function more as marketing instruments than as effective risk-mitigation mechanisms for financiers or fleet owners.

4.3 Overview of findings: climate adaptation

Climate adaptation interventions in India span seven sub-sectors – agriculture, water, forestry and biodiversity, coasts and islands, the Himalayan ecosystem, disaster management, and health – as identified in India’s TNC-IAC submitted to UNFCCC. Accordingly, financing barriers for adaptation were assessed holistically rather than at the level of individual sub-sectors.

Lack of clarity regarding what qualifies as adaptation:

The absence of universally accepted definitions and taxonomies for adaptation has led to inconsistent eligibility criteria across funders. Stakeholders also noted inadequate climate risk awareness and limited training at the branch level among domestic lenders, which constrain their ability to identify and appraise adaptation-related investments.

Absence of revenue streams and viable business models: Most adaptation solutions (such as mangroves, early warning systems, and climate-

resilient public infrastructure) generate non-revenue benefits and are treated as public goods, limiting their suitability for pure private investment. Moreover, short asset holding periods among some financial institutions (2-3 years), reduce incentives for supporting long term adaptation investments.

Challenges in municipal financing: Urban local bodies in India often lack the institutional capacity and ring-fenced financial structures required for direct borrowing for adaptation-focused projects. Stakeholders also highlighted that environmental and social (E&S) due diligence standards remain underdeveloped at the municipal level, constraining access to finance for adaptation-related projects.

The financing ecosystem needs to evolve to meet the challenges of adaptation financing: Stakeholders broadly acknowledged that, while climate adaptation is recognised as both a development and an economic priority, the existing financing ecosystem is not yet designed to support adaptation investments at scale.

5. Framework to mobilise private-sector finance

Building on insights from stakeholder discussions in the previous section, supplemented by CEEW analysis, this section distils the findings into a structured framework for mobilising private-sector finance. To enhance usability as a policy reference tool, the framework is presented as a simplified 3×3 matrix. It groups financing challenges into three categories and, correspondingly, organises solutions accordingly. These categories of financing challenges and solutions are outlined as follows, followed by the framework itself.

Financing challenges

- **Flow:** Finance is either flowing at minimal levels or not flowing at all.
- **Cost:** Finance is flowing but on onerous terms.
- **Scale:** Conventional financing sources may be insufficient to meet investment requirements.

Solutions

- **Instruments:** Financial solutions, market mechanisms, and business models.
- **Institutions:** Existing or proposed entities that can anchor the identified policy and regulatory measures or the proposed financial instruments.
- **Policies and regulations:** Policy- and regulatory-level recommendations.

Within the framework, each instrument and policy or regulation is paired with an institution best suited to anchor it. In this manner, the framework proposes targeted solutions to specific challenges pertaining to each sector – power, industry, road transport, and adaptation – rather than broad, overarching solutions, which may apply across sectors.

Table 2. Framework for the mobilisation of private finance for climate investments

Sector	Sub-sector	Financing challenge		Solutions		
		Type	Description	Instrument	Institution	Policies and regulations
Mitigation						
Power	Renewable energy (generation)	Scale	Conventional financing sources are insufficient due to emerging headroom constraints	NaBFID Carve-out for RE in NaBFID's proposed partial credit enhancement (PCE) facility		PFRDA/IRDAI Mandate minimum allocation to green bonds for regulated entities
						RBI Fully accessible route (FAR) designation for corporate green bonds
		Flow	Unsigned power sales agreements with state discoms			BEE Monitor states' compliance under newly notified Renewable Consumption Obligation (RCO) regime
						REIA + states Closer coordination on demand prior to floating tenders
		Timely availability of transmission connectivity data			CEA + PGCIL Real-time transmission connectivity updates	
		Compliance with the land and right-of-way requirements of the RBI (Project Finance) Directions, 2025, is perceived to be onerous			RBI Monitor the pace of RE loan disbursements by mandating disclosure of all RE loan portfolios, not just those covered by priority sector lending (PSL)	
	Battery energy storage systems (BESS)	Cost	Finance is available but on inferior terms due to limited technology performance track record	A dedicated NGFI Guarantees to improve the terms of finance		MoF Integrate BESS into India's upcoming climate finance taxonomy
Industry	Green hydrogen (domestic)	Flow	Commercial viability relative to conventional alternative	MoEFCC Facilitate implementation of cross-border Article 6 deals for GH2/ammonia projects		
				A dedicated NGFI Concessional equity to unlock the potential of GH2 on a project basis		
					IFSCA In addition to eligible taxonomies, integrate CCTS into Framework for Transition Bonds to widen coverage of end-use sectors	
	Green hydrogen (international)	Flow	Limited domestic conversion infra (hydrogen → ammonia) for exports			MNRE/MoPNG/MoC&F Demand-side mandates, such as hydrogen purchase obligations
						MNRE/MoPNG/MoPSW Boost conversion infrastructure

Sector	Sub-sector	Financing challenge		Solutions		
		Type	Description	Instrument	Institution	Policies and regulations
Mitigation						
Road transport	Electric vehicles	Cost	Finance is available but on inferior terms due to concerns over (i) lifetime battery performance (ii) absence of a vibrant secondary market for EVs	A dedicated NGFI Guarantees to mitigate risk perceptions and support the establishment of a loan performance track record		
				Department of Science and Technology (DST) + OEMs + battery manufacturers Battery performance tracker leveraging proposed Battery Pack Aadhar System		
				OEMs + battery manufacturers Integrating battery performance tracker into EV buyback schemes		
Adaptation						
Cross Sectoral		Flow	More clarity needed on what qualifies as adaptation		MoF Finalise and release climate finance taxonomy	
			Lack of revenue streams and/or business models	A dedicated NGFI Focus on cross-cutting projects (adaptation and mitigation) and devise innovative public-private partnership (PPP) business models		
			Challenges in municipal financing	Municipal corporations Adopt Reform Identify Strengthen and Engage (RISE) framework for issuance of municipal bonds		
					PFRDA/IRDAI Demand side mandates for regulated entities, complementing existing and proposed supply side interventions by MoHUA	
			The financing ecosystem needs to evolve to meet the adaptation finance challenge	Development finance institutions (DFIs) Lines of credit routed through commercial banks with amounts earmarked for climate adaptation		
					SEBI Shift adaptation measures to essential indicators instead of the current specification under leadership in BRSR	
					RBI Shift disclosure requirements pertaining to adaptation that feature under 'enhanced' to 'baseline' under the Draft Climate-related Financial Risk Disclosures	

Source: CEEW-GFC stakeholder consultations and authors' analysis

6. Conclusion

Accelerating climate action is a global imperative, and the availability of adequate and affordable climate finance is critical to advancing it at pace and scale. Private capital will play a key role in achieving global climate goals in a timely manner. The same applies in the Indian context, which has already witnessed notable success in mobilising private capital for climate action. However, effective solutions will be critical to address existing financing bottlenecks and elevate private capital flows, in order to support the investments required to meet India's climate objectives. These requirements amount to ~USD 22.7 trillion to decarbonise the power, industry, and road transport sectors over the 45-year period to 2070, and to ~USD 700 billion for climate adaptation by 2030. The analysis in this policy brief highlights two key considerations to advance this process.

First, the sectors pertaining to climate mitigation and climate adaptation - as a whole - are at varying stages of evolution. While financing challenges vary across these sectors, they can broadly be classified into three categories. In some cases, **finance is flowing at minimal levels or not flowing at all**; in others, finance is flowing but on onerous terms; in the remainder, finance is flowing at pace and on competitive terms, but conventional sources of finance remain inadequate relative to the scale of India's climate ambitions. For the first category, solutions must aim to kickstart the flow of capital; for the second, solutions should endeavour to improve the terms of finance and for the third, they should unlock new sources of capital to supplement existing ones.

Second, once the financing challenge within each sector is diagnosed, how should policymakers approach the development of suitable interventions? Sector-specific challenges require a distinct set of solutions spanning instruments, policies and regulations, and institutions best suited to anchoring the solution, as specified by the framework developed in this policy brief.

In this way, the framework seeks to simplify the task of policymakers who are faced with a complex challenge. On the one hand, this challenge pertains to creating the right environment to elevate the current rate of capital flows for mitigation. On the other hand, it pertains to unlocking capital flows in the first instance for adaptation. The framework proposes 25 targeted solutions designed to kickstart financial flows, improve terms, or unlock new sources of finance to address the underlying challenges of flow, cost, and scale.

Beyond India, this framework could serve as a template for other countries in the Global South, many of which face similar challenges to those faced by India. South—South cooperation is also specifically mentioned in the *Fourth Report of the Independent High-Level Expert Group (IHLEG) on Climate Finance* as a powerful channel for mobilising climate finance across EMDEs. It is time for the Global South to take a cue and amplify this channel. The framework outlined in this policy brief could be a valuable building block towards this end.

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Acronyms

AMRUT	<i>Atal Mission for Rejuvenation and Urban Transformation</i>	EV	electric vehicle
AT&C	aggregate technical and commercial	FAME	<i>Faster Adoption and Manufacturing of Electric Vehicles</i>
BAU	business as usual	FAR	fully accessible route
BEE	Bureau of Energy Efficiency	FDI	foreign direct investment
BESS	battery energy storage systems	GDP	gross domestic product
BRSR	Business Responsibility and Sustainability Reporting	GH2	green hydrogen
BUR	<i>Biennial Update Report</i>	GHG	greenhouse gas
CEA	Central Electricity Authority	GoI	Government of India
CEEW	Council on Energy, Environment and Water	HAP	heat action plan
CFA	central financial assistance	ICE	internal combustion engine
CPI	Climate Policy Initiative	ICMA	International Capital Market Association
CPSU	Central Public Sector Undertaking	IEA	International Energy Agency
CCTS	<i>Carbon Credit Trading Scheme</i>	IFSCA	International Financial Services Centres Authority
DFI	development finance institution	IHLEG	Independent High-Level Expert Group
DPIIT	Department for Promotion of Industry and Internal Trade	IMD	India Meteorological Department
DST	Department of Science and Technology	IRDAI	Insurance Regulatory and Development Authority of India
ECB	external commercial borrowing	ISTS	inter-state transmission system
EMDEs	emerging markets and developing economies	JJM	<i>Jal Jeevan Mission</i>
ESG	environmental, social, and governance	JCM	Joint Crediting Mechanism
		MISHTI	<i>Mangrove Initiative for Shoreline Habitats and Tangible Incomes</i>

MMTPA	million metric tonnes per annum	PIB	Press Information Bureau
MNRE	Ministry of New and Renewable Energy	PM-KUSUM	<i>Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan</i>
MoC	memorandum of cooperation	PPP	public–private partnership
MoEFCC	Ministry of Environment, Forest and Climate Change	PSA	power sale agreement
MoF	Ministry of Finance	PSL	priority sector lending
MoHUA	Ministry of Housing and Urban Affairs	PSU	public sector undertaking
MoJS	Ministry of Jal Shakti	PV	photovoltaic
MoP	Ministry of Power	RE	renewable energy
MoPNG	Ministry of Petroleum and Natural Gas	REIA	Renewable Energy Implementing Agency
NAFCC	National Adaptation Fund for Climate Change	RBI	Reserve Bank of India
NAPCC	National Action Plan on Climate Change	RCO	renewable consumption obligation
NBFC	non-banking financial company	RDSS	<i>Revamped Distribution Sector Scheme</i>
NDC	Nationally Determined Contribution	SAPCC	state action plan on climate change
NDMA	National Disaster Management Authority	SEBI	Securities and Exchange Board of India
NGFI	National Green Financing Institution	SECI	Solar Energy Corporation of India
NHPC	National Hydroelectric Power Corporation	SIGHT	<i>Strategic Interventions for Green Hydrogen Transition</i>
NTPC	National Thermal Power Corporation	SJVN	Satluj Jal Vidyut Nigam
OECD	Organisation for Economic Co-operation and Development	T&D	transmission and distribution
OEM	original equipment manufacturer	TNC-IAC	Third National Communication and Initial Adaptation Communication
PCE	partial credit enhancement	UNFCCC	United Nations Framework Convention on Climate Change
PGCIL	Power Grid Corporation of India Limited	UT	union territory
		VGf	viability gap funding

Annexure

Table A1. Sub-sectors within tracked mitigation finance sectors

Sector	Sub-sector
Clean energy	<ul style="list-style-type: none"> • Biofuel • Biogas energy • Biomass and waste • Energy storage • Hydro energy • RE – multiple • Rooftop solar photovoltaic (PV) • Solar PV • Solar thermal • Wind – onshore • Wind - offshore • Research and development
Energy efficiency	<ul style="list-style-type: none"> • Energy conservation • Energy-efficient appliances • Energy-efficient equipment • Green buildings • Green energy corridor • Process efficiency • Smart grids • Transmission and distribution • Research and development
Clean transportation	<ul style="list-style-type: none"> • Bicycle sharing • Dedicated freight corridor • EV (including charging infrastructure) • Electronic trolley bus • Mass rapid transit system (MRTS) • Public transportation • Research and development

Source: CPI (2024, Approach and Methodology)

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