

Module I: Climate finance for cities

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Details

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Abbreviations

ADB	Asian Development Bank
AFD	French Development Bank
BDB	Bilateral Development Bank
BE	Budget Estimates
BMU	Federal Ministry German Government
BRT	Bus Rapid Transit System
CPI	Climate Policy Initiative
CTF	Clean Technology Fund
DHI	Department of Heavy Industries, Government of India Power
DISCOM	Power Distribution Company
DPR	Detailed Project Report
DSRA	Debt Service Reserve Account
EE	Energy Efficiency
EESL	Energy Efficiency Services Limited
ESCO	Energy Service Company
FFC	Fifteenth Finance Commission
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gases
GLP	Green Lending Principles
GOTN	Government of Tamil Nadu
HUDCO	Housing and Urban Development Corporation
IA	Implementation Agency
JEC	International Finance Corporation
INR	Indian Rupee
IREDA	India Renewable Energy Development Authority
ITMO	Internationally Transferred Mitigation Outcomes
MDB	Multilateral Development Bank
MNRE	Ministry of New and Renewable Energy, Government of India
MOEFCC	Ministry of Environment and Climate Change, Government of India
NABARD	National Agriculture and Rural Development Bank
NAPCC	National Agriculture and Rural Development Bank
NBFC	Non-Banking Financial Company
NCT	National Capital Territory

NDC	Nationally Determined Contributions
NIE	National Implementation Entity
NIUA	National Institute of Urban Affairs
NMT	Non-Motorised Transport Overseas Development Institute
ODI	Official Focal Point
OF	Participating Financial Institution
PFI	Public Private Infrastructure Advisory Facility
PPIAF	Public Private Infrastructure Advisory Facility
RE	Renewable Energy
RWA	Residents Welfare Association
SCCF	Special Climate Change Fund
SDG	Sustainable Development Goals
SEA	South East Asia
SEBI	Securities Exchange Board of India
SEI	Specialised Financial Institutions
SIDBI	Small industries development bank of India
SPV	Special Purpose Vehicle
TA	Technical Assistance
TNUIESI	Tamil Nad Urban Infrastructure Financial Services Limited
TOD	Transit Oriented Development
UK BEIS	United Kingdom Department of Business, Energy & Industrial Strategy
ULB	Urban Local Body
UN	United Nations
UNEP	United National Environment Program
UNFCC	United Nations Framework on Climate Change
USD	US Dollar

Climate finance for cities: Mobilising finance for Climate Resilient Infrastructure

Number of pages: 33

Learning goal:

Upon completion of this module, you will be able to:

- learn the basics and fundamentals of urban climate finance and key trends
- understand different sources of urban climate finance available to the city
- Identify the source of urban climate finance at different stages of project preparation
- understand the precursors of various funds/programmes and instruments
- learn about the importance of climate finance and how to identify climate finance for municipal projects

Training Structure

- Offline/ Online trainings sessions through Presentations, Set of Exercises, User Manual for tools and ToT manuals
- Training and reference material with respect to mapping on the above topic (this module)

1. Introduction

The world is urbanizing at a rapid pace, and it is projected that 68% of world's population will reside in urban areas by 2050 (UNDESA, 2018). While urbanisation opens gateway to wider economic development, but is also have reparation in form of carbon emission from increase in energy demand at one hand and impact of extreme climate change events on other side. Cities are amongst biggest contributor as well as most vulnerable to climate change contributing to 75% of global carbon emissions. (UNEP, n.d). Hence, the cities have a key role to play in achieving global climate ambition to restrict world temperature rise by 1.5 degrees which would require significant investments in low carbon and climate resilient infrastructure.

World bank estimates that emerging economies will need to invest around 4.5 per cent of GDP (~over USD 2 tn) annually in development of sustainable infrastructure to achieve the SDG 2030 agenda. Another estimate from IEA suggest investments to the tune of 4% of global GDP is required to achieve net zero ambitions. Most of this investment would be focused on low carbon technologies and climate resilient infrastructure development in cities led by emerging economies. Moreover, once the acute phase of the COVID-19 crisis is over, governments will need investments in infrastructure more than ever to accelerate economic recovery, create jobs, reduce poverty, and stimulate productive investment. But most cities in these emerging economies face challenges in mobilising resources to finance the investments, given limited public resources and capacities, to narrow the investment gap these cities need to collaborate with regional and international sources of climate finance to unlock private sector infrastructure financing at scale.

India is amongst the fastest growing emerging economies in the world home to around 17% of world's populations, the rate of urbanisation in India is faster than most South Asian countries. UN estimates by 2050 the urban population size in India is set to double from 461 million to 877 million which would be in absolute numbers largest amongst the bigger Asian nations. High rates of urbanisation, industrialisation and economic development is exerting significant additional pressure on civic services and infrastructure across cities in India. This demographic pressure on urban infrastructure and services has mounted and is expected to increase in the future. The current quality of services and provision of infrastructure has, in turn, made cities both responsible for, and vulnerable to, climate change. It is estimated urban India generates 87% of national GHG emissions and multiplier effect of the impact of climate change disasters will expose USD 2 trillion of urban infrastructure assets and far reaching impact on the economy. Hence, to align with recently announce national ambition to achieve net zero by 2070, It is critical cities in India invest in development of low carbon and climate resilient infrastructure.

Development of such infrastructure would require significant investments, an investment requirement of INR 91 trillion (at current prices) was estimated by a high -powered government expert committee. A similar assessment was conducted by McKinsey Global Institute, which projected an investment need of INR 85 trillion (current prices) over the same period for the development of sustainable and inclusive urban infrastructure. National Infrastructure Pipeline recently estimated that an investment outlay of INR 19 trillion would be needed for urban infrastructure between 2021 and 2025. This translates into an average annual investment between INR 2.3-2.5 trillion over the next decade.

Given the limited public resources with the cities, they need to work towards blending the available climate finance resources from national & state budget, international development finance and climate funds towards mobilising investments from private sector at scale. This in turn requires cities to structure and develop a pipeline projects which are 'bankable' and wherever possible blend financing with available sources of local, regional and national climate finance. But at present cities face multiple internal as well as external constraints as below

- **Capacity constraints:** limited technical capacity to design “bankable” projects; limited knowledge of local, regional and national sources of climate finance and innovative structures, lack of capacity to execute complex financial transactions along with governance factors.
- **Institutional constraints:** low credit worthiness of Urban Local Bodies (ULB); willingness to charge for services to citizen to recover project costs
- **Market constraints:** underdeveloped debt capital markets for municipal borrowing, high transaction cost from investor’s side

To circumvent the above capacity constraints and build capacities of city and state officials to enable access to climate finance, CapaCITIES a multiyear project supported by Swiss Agency for Development and Cooperation is working with 8 Indian cities and 2 States since last 6 years. The project team through working very closely with city and state officials have identified the key capacity gaps and has designed a comprehensive training program with two modules incorporating the best practices, approaches from the CapaCITIES project as well as national and global cases. These modules include:

1. Module I: Climate finance for cities: focusing on building knowledge of city and state officials on sources and application of climate finance
2. Module II: Designing ‘bankable’ climate resilient infrastructure projects: focusing on building capacity of city officials to incorporate bankability at each stage of project preparation

Hence, this module 1 outlines a taxonomy of climate finance sources, instruments and funding mechanisms available to Indian cities which can be used for low carbon and climate resilient infrastructure project at various stages. The module is structure as follows:

- Section 1: on definition and role of urban climate finance and key trends in climate finance for cities
- Section 2: on public and private sources and instruments of climate finance for cities and their use and suitability for different sectors and stages of project development



2. Section 1: Introduction to climate finance



Urban climate finance refers to resources directed to activities limiting city-induced GHG emissions or aiming to address climate-related risks faced by cities, contributing to resilience and low carbon development.

Climate Policy Initiative, 2021

Climate finance in general is a subject with many facets. However, it is different from sustainable finance or green finance. While engaging in the topic, one might confuse climate finance to green finance, however, there is a significant difference between the two. Climate finance is just one component of the larger landscape of sustainable finance in the context of financing the Agenda 2030 and the Sustainable Development Goals (SDGs) (GIZ, 2021). Sustainable finance covers multiple policies and institutional arrangements to attract private sector investments to address all the aspects of sustainable development namely environmental, social, economic and governance. Now, under the environmental aspect of climate finance, initiatives that focus on investments related to mitigation and adaptation of climate change are referred to as 'climate finance'. Figure 1 below depicts how climate finance is a part of sustainable finance. Now, if the finance initiatives are only focused to attract investment for climate change activities, such a kind of finance is known as Low Carbon Finance.

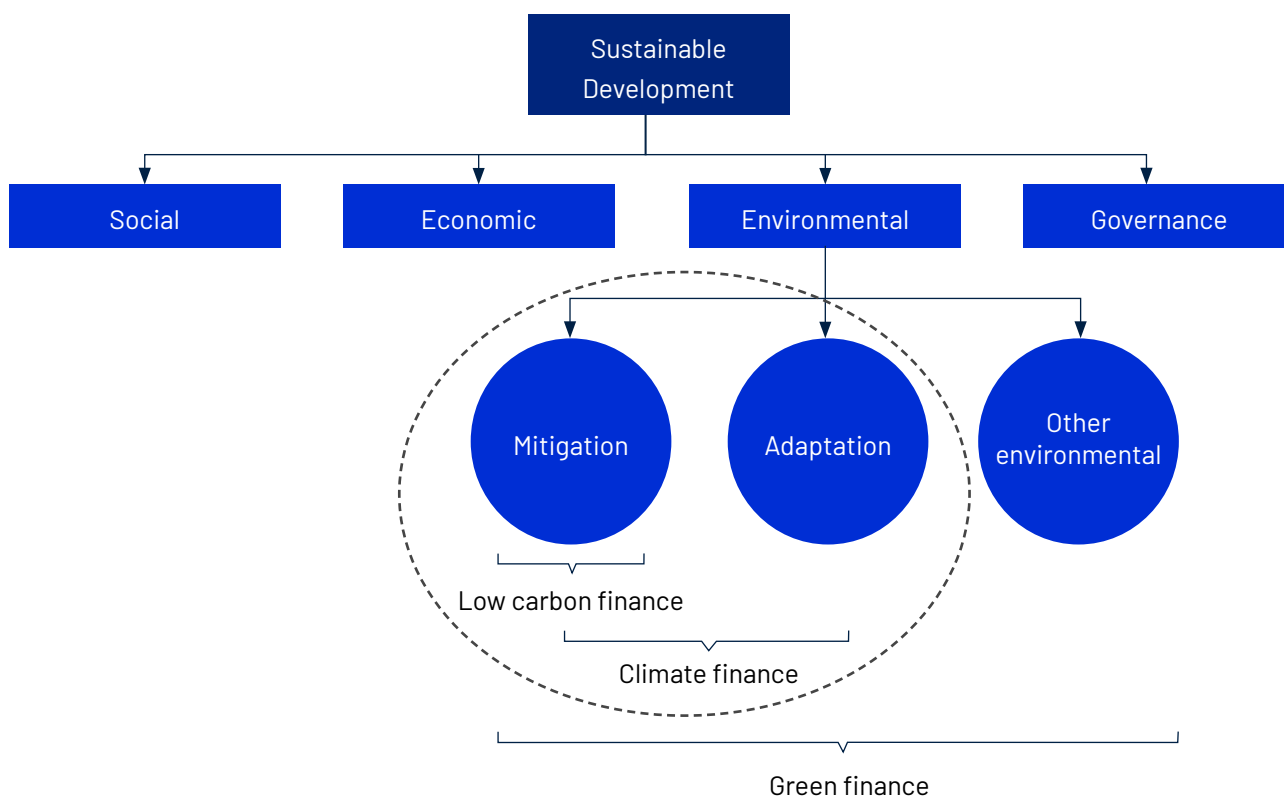


Figure 1: Climate finance as a component of sustainable finance

(Source: South Pole based on UNEP enquiry, 2016¹)

Now, the component of climate finance focusing on urban development and cities is generally referred to as Urban climate finance. A recent study published by Climate Policy Initiative (CPI) defines urban climate finance as resources directed to activities limiting city-induced GHG emissions or aiming to address climate-related risks faced by cities, contributing to resilience and low carbon development. The idea to access such a finance facility is that the activities or projects that focus on mitigation or adaptation should lie within the urban inclusion boundaries. Figure X below highlights some of the activities that are considered to be included in the urban boundaries.

¹ http://unepinquiry.org/wp-content/uploads/2016/09/1_Definitions_and_Concepts.pdf

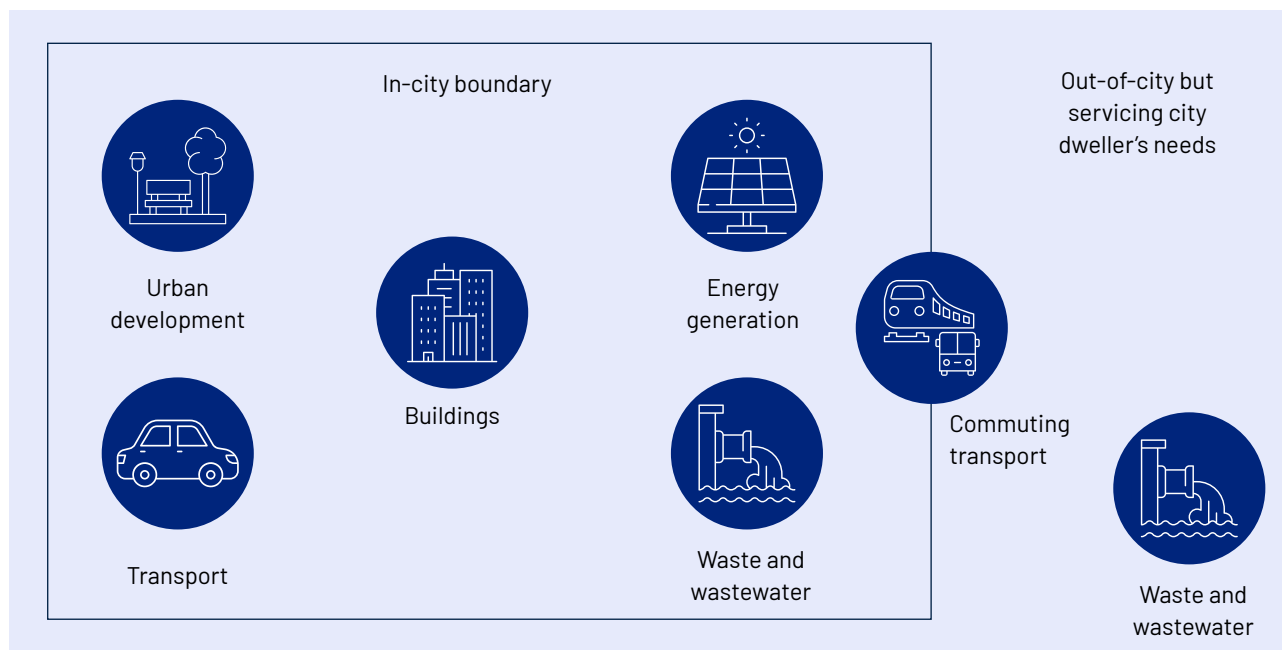


Figure 2: Coverage of urban climate finance

(Source: CPI 2021)

1.1 Role of urban climate finance

Urban climate finance is much needed by Indian cities to develop on a low-carbon pathway. A major part of India's population is residing in urban areas. Cities are more vulnerable to climate change, hence, it makes it imperative that cities learn more about urban climate finance. The benefits of urban finance in cities are as follows:

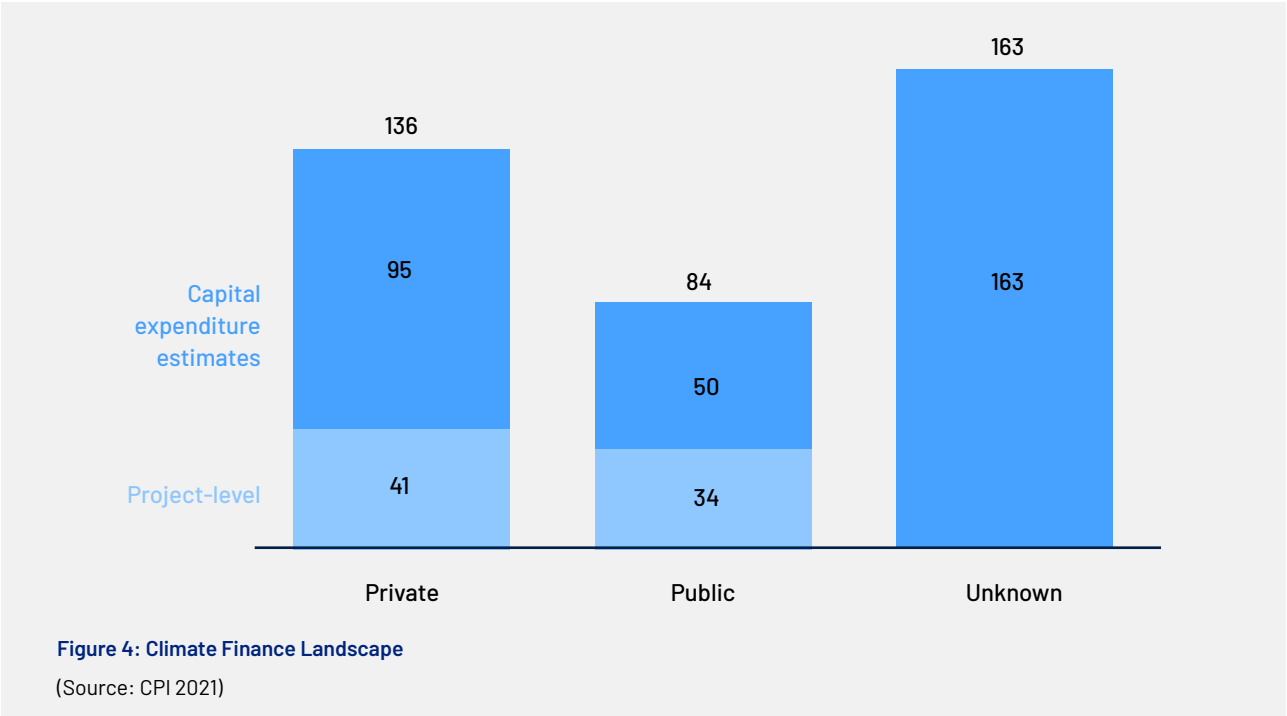
1. **Inject finance into new projects:** Urban finance enables cities to undertake climate efficient and resilient projects that have significant impact.
2. **Provides de-risking instruments to ensure minimum performance:** City authorities and project developers are provided with greater access to finance (such as guarantees and insurances) that reduce the risk for implementation.
3. **Help the national governments to achieve its climate change agenda:** Including climate finance related investments helps cities implement more mitigation and adaptation measures. This in turn supports the national governments to achieve its NDC related targets.
4. **Make projects look more attractive:** A general project that has a reasonably positive impact on climate change becomes more attractive to funding as it has multiple benefits.

1.2 Urban climate finance landscape

According to the Climate Policy Initiative report on 'State of cities finance, 2021', annual urban climate finance in 2017/18 was USD 384 billion. The report analysed that the majority of the urban climate finance flows were mobilized in the East Asia and Pacific region (driven by investment in China) and Western Europe. In terms of sectoral usage of the finance, given below is a breakdown of the climate finance flow in figure 2 below:



The finance landscape can be distinguished between two sources in the report: public and private. CPI defines public finance as funds provided by the government and their agencies, climate funds and development finance institutions (DFIs). According to the CPI report, the private sector provided the maximum contribution in urban climate finance in 2017/18. However, out of the USD 384 billion, the report could only identify whether the capital was sourced from public or private actors for USD 221 billion.



If geographical flow of climate finance is considered, the largest portion of finance was invested in and for China and in developed economies. If the investment opportunity is considered, it is interesting to note that East Asia and Pacific countries have the maximum potential from 2018- 2040 followed by Latin America and the South Asian countries.

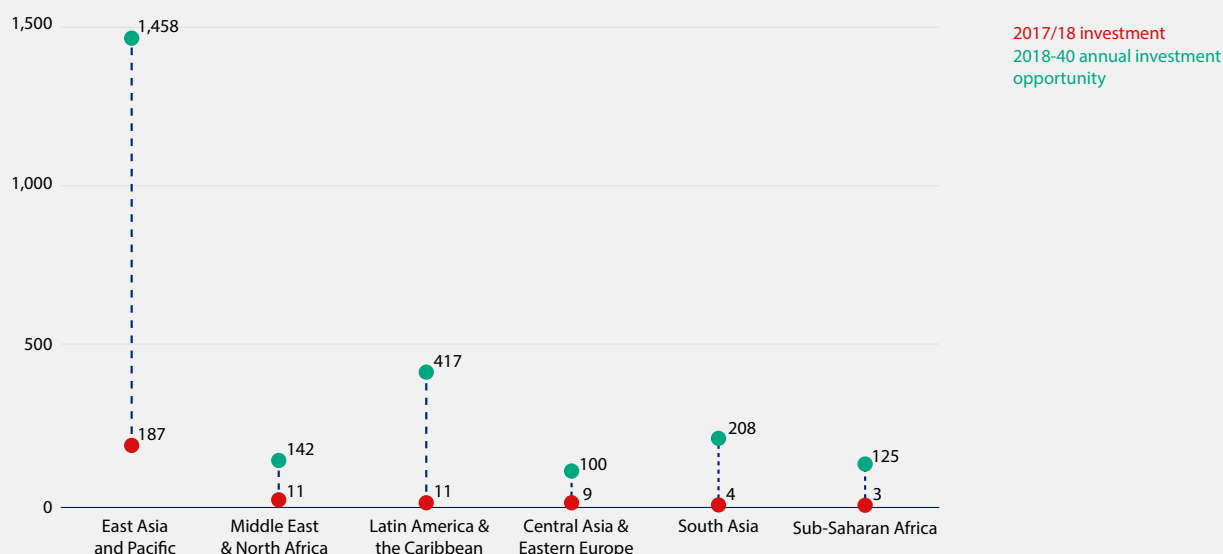


Figure 5: Geographical Spread of Climate Finance

Source: Alliance and IFC data (IFC, 2018).

In terms of usage of climate finance, most of the urban climate finance was used to fund mitigation related activities and a very small percentage went to adaptation projects. Given below is a figure from the CPI report showing exact amounts of funding used by different types of projects:

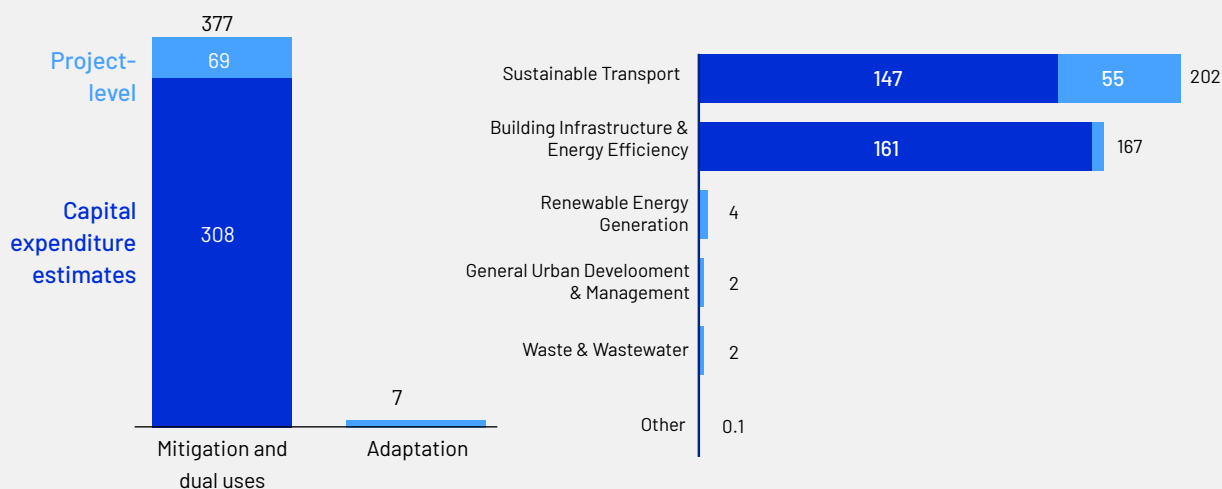
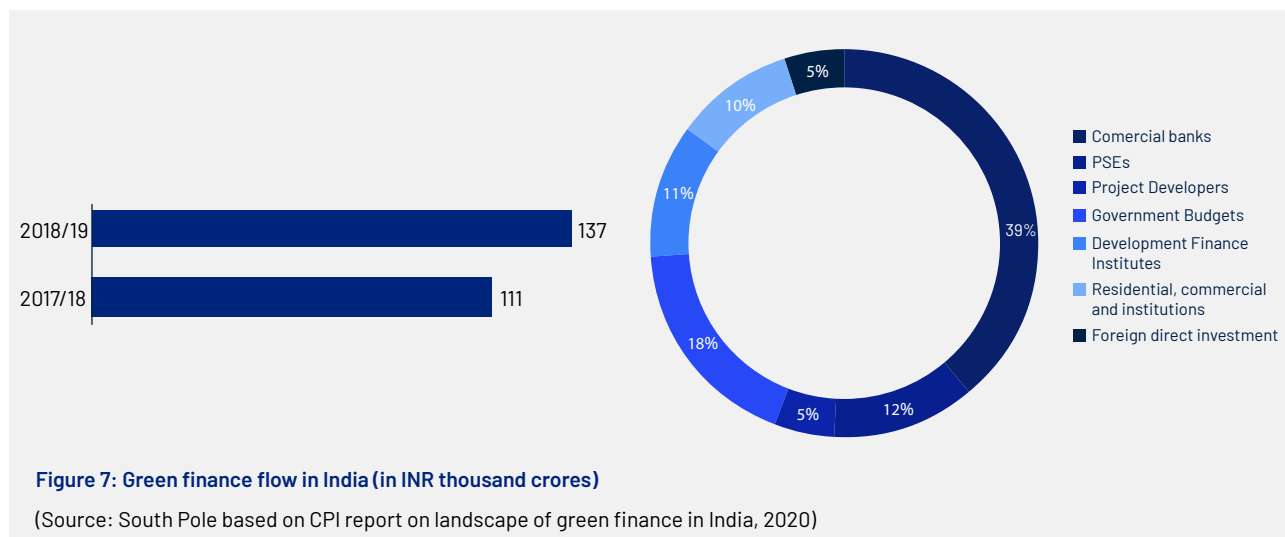


Figure 6: Sector wise breakup climate finance

In terms of urban climate finance usage in mitigation and dual uses, investments in urban transport represented 53% of total urban climate finance estimated at USD 202 billion in 2017- 2018. Out of this, almost USD 55 billion was used at the project-level, of which USD 40 billion targeted private electric vehicles and charging infrastructure. The remaining USD 15 billion corresponds to a variety of urban projects such as low-carbon public transport like metros and trams, or cycle lanes and walking projects. The remaining USD 147 billion corresponds to capital expenditure estimates for urban transport infrastructure and non-motorized transport. USD 167 billion were invested in building infrastructure and energy efficiency projects. Remaining small amounts of funds were also allocated to RE generation, urban development and management, waste and wastewater management.

1.3 Climate finance landscape- India

India is a growing market for climate finance. The climate finance flows in India have been increasing considerably. CPI India recently published a report on the landscape of green finance in India. The report along with climate finance, analysis of other environmental finance is also considered. According to the report, the green finance flow in India increased by INR 27,000 crores (or USD 3.2 billion) from FY 2018 to 2019 (Figure 27).

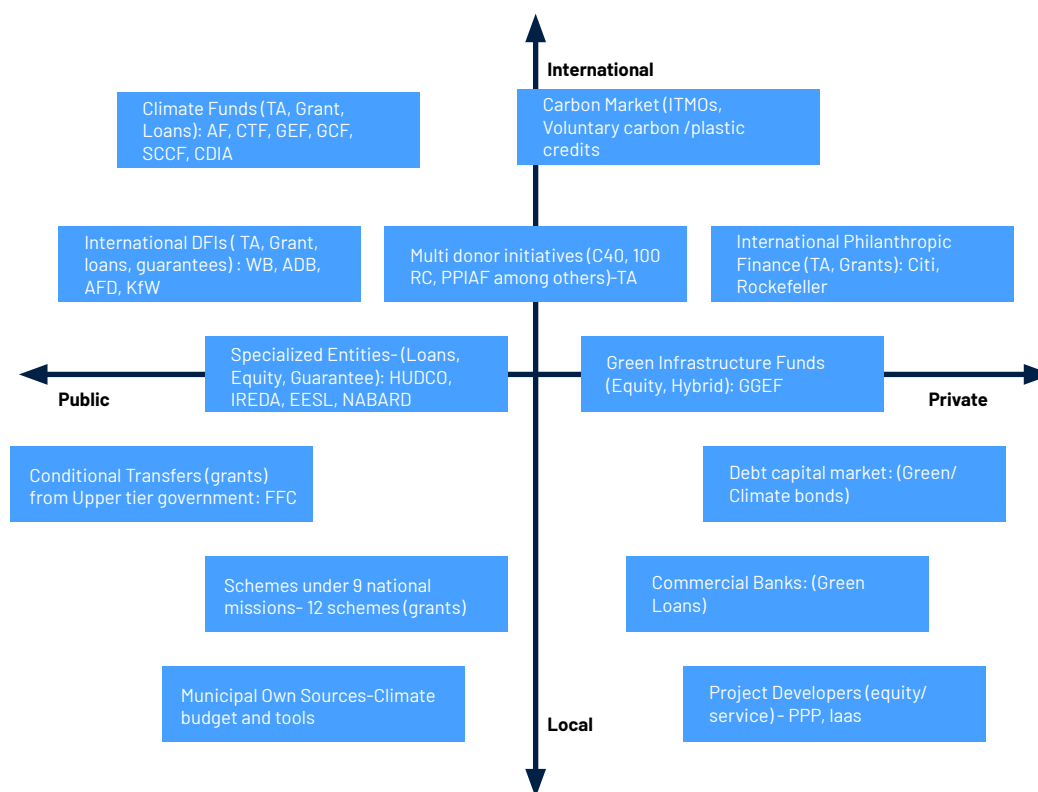


In terms of channels of climate finance in India, commercial banks followed by PSEs and government budgets are the major source of climate finance. For cities budgetary provisions (internal as well as state/ national), followed by PSEs, Development finance institution (DFIs) are important intermediation channels for urban climate finance. The next chapter discusses the public and private sources of urban climate finance which can be accessed by city to develop climate resilient infrastructure.



3. Source of climate finance for cities

This section maps the sources of climate finance that cities can tap for funding climate resilient infrastructure development. The sources of funding can public as well as private at local, regional, national and subnational level. The figure below captures all major sources of climate finance available to Indian cities, this chapter further elaborates on each of these sources and their relevance to the cities in financing preparation as well as development of climate resilient infrastructure.



Abbreviations: **FFC:** Fifteenth Finance Commission; **HUDCO:** Housing and Urban Development Corporation; **NABARD:** National Agriculture Bank and Rural Development; **IREDA:** India Renewable Energy Development Authority; **EESL:** Energy Efficiency Services Limited; **WB:** World Bank; **ADB:** Asian Development Bank; **KfW:** German Development Bank; **AfD:** French Development Bank; **AF:** Adaptation Fund; **CTF:** Clean Technology Fund; **GEF:** Green Environment Facility; **SCCF:** Special Climate Change Fund; **CDIA:** City Development Initiative of Asia; **ITMO:** Internationally Transferred Mitigation Outcomes; **100 RC:** 100 Resilient Cities; **PPIAF:** Public Private Infrastructure Advisory Facility

Figure 8: Sources of Climate Finance for Cities

(Source: South Pole, 2021)

Broadly the sources of climate finance to cities can be divided into public and private sources, the key sources of public climate finance have been outlined in the figure below:

3.1 Public Sources of Urban Climate Finance

The public sources of climate finance to cities broadly include municipal own sources and transfer from upper tier governments at local level and development finance institutions at international level. These sources provide climate finance to cities through varied financial instruments like grants, concessional loan, guarantees also provide technical assistance to build capacities of city officials for project preparation and designing 'bankable' projects. The key sources along with the type of instruments have been outlined in the figure below:

Public sources:

Ministries and Government Agencies	<ul style="list-style-type: none"> Conditional Transfers (FFC) Government Schemes (9 National missions) Specialized financial institutions (EESL, IREDA, NABARD, HUDCO) 	Grants, Concessional loans, guarantees, credit enhancements
Municipal Own Sources	<ul style="list-style-type: none"> User Charges Development Charges Taxes Other Sources 	Integrating into climate budget/ used for O&M
Development Finance Institutions and Climate Funds	<ul style="list-style-type: none"> Multilateral Development Banks (MDB) Bilateral Financial Institutions Climate Funds 	Technical assistance, financial instruments & specialized knowledge
Other International Public Climate Finance	<ul style="list-style-type: none"> Country Partnerships Carbon Markets RECs 	Technical assistance, pilots & monetizing carbon

Figure 9: Public sources of urban climate finance

(Source: South Pole, 2021)

3.1.1 Ministries and Government Agencies

Transfers from Central (upper tier) Government- Conditional Transfers

The cities in India, are highly dependent on the transfers from State Government and Central Government for development of major infrastructure projects. The allocation of municipal governments in the central treasury is set through the Finance Commission. Based on the recommendations from the Finance Commission, devolution of finance from central to state and city government is made. While the regular grants are provided based on population and area factors, the fifteenth finance commission has introduced concept of "Million cities challenge fund" through which million plus cities are given conditional grants based on the efforts taken by them to (a) improve ambient air quality (b) service level and resilience of water recycling, solid waste management and drinking water infrastructure. Below table gives a snapshot of the conditional FFC grants which can be used as a source of urban climate finance.

Table 1: Snapshot FFC Conditional Grant

Fifteenth Finance Commissions Conditional Grant		
1	Instrument Type	Grant- conditional tied up to performance
2	Sectors/ projects	1. Air pollution improvement- NMT, E-mobility, monitoring infrastructure 2. Service level improvement- Solid Waste Management, Water Recycling, Drinking Water
3	Climate smart activity	Mitigation and Adaptation
4	Eligibility	Million plus cities and urban agglomerations
5	Process	3. Air Pollution: City wise action plan- monitoring, source apportionment and proposed measures to be submitted to State (further to be shared to MoEFCC for approval) 4. Other areas: City wise action plan- monitoring, source apportionment and proposed measures to be submitted to State (further to be shared to MoEFCC for approval)
6	Grant Size	INR 38,196 cr. over 5 years
7	City Access	Indirect through State Government- Grants tied to the above sectors can be used for mitigation and adaptation activities.

Government Schemes

National Action Plan on Climate Change (NAPCC) is the umbrella policy under which around 8 national level missions have been curated to achieve India's commitment towards NDCs and Paris agreement. These missions have dedicated sectoral schemes that are focused upon various sub sectors, which can be used by cities to develop climate resilient infrastructure. Below table shows the extent of the schemes and their utility towards urban climate finance.

Table 2: Snapshot Government Schemes and Missions

National Solar Mission (Ministry of New and Renewable Energy) National Mission for Enhanced Energy Efficiency (Ministry of Power)						
1	Scheme (link to the official page)- Nodal Ministry	Street Lighting National Ministry of Power Program- Ministry of Power	Municipal Energy Efficient Program (MEEP) Ministry of Power	Grid Connected Solar Part II Ministry of New and Renewable Energy (MNRE)	Program on energy from Urban Municipal Waste- MNRE	Partial Risk Guarantee Fund for Energy Efficiency- Ministry of Power
2	Instrument Type	ESCO- Funding	ESCOFunding	Grant to Citizens	Grant to developer	Guarantee to PFI for lending to ESCO
3	Sectors/ projects	Energy Efficiency Street Lighting EfficiencyStreet Lighting	Energy Efficiency- Municipal Water Pumps	Renewable EnergySolar	Low Carbon Energy Waste Management	Energy Efficiency- Municipal Buildings
4	Climate smart activity	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
5	Eligibility	1750 cities	300 cities	Household/RWA	ULBsMunicipal Solid Waste plant	ESCO for ULB/ govt.. buildings
6	Process	ULB/ State level arrangement with IA i.e. EESL	ULB/ State level arrangement with IA i.e. EESL	Through DISCOM	Through developer	ESCO through registered PFI can avail guarantee
7	Grant size	ESCO- no capex from ULB		30% of capex (INR 198 Cr.)	INR 10 Cr./ project	Max. INR 10 Cr. per project guarantee
8	City Access	Direct and Indirect	Indirect	Indirect through DISCOM	Indirect through developer	Indirect through ESCO

National Mission on Sustainable Habitat- Ministry of Housing and Urban Affairs (MoHUA)					
1	Scheme	AMRUT 2.0	Swachh Bharat Mission- Urban	Smart Cities Mission	Urban Transport
2	Instrument Type	Grant	Grant	Grant	Grant- Equity based support
3	Sectors/ projects	Water Supply universal coverage Sewerage, septage management and recycle/ reuse of treated used water Rejuvenation of water bodies and green spaces	Solid Waste Management	ICT based smart urban infrastructure development	Metro Project
4	Climate smart activity	Adaptation	Mitigation	Adaptation and Mitigation	Mitigation
5	Eligibility	502 cities	All cities	108 Smart CITIES	Feasible project report

6	Process	ULB/ State level annual action plan submitted for approval	ULB to design project and DPR and apply for grant/ viability gap	Through Smart City SPV	ULB along with State Govt. to submit feasibility report for approval
7	Grant size	ESCO- no capex from ULB		30% of capex (INR 198 Cr.)	INR 10 Cr./ project
8	City Access	Direct and Indirect	Indirect	Indirect through DISCOM	Indirect through developer

National Mission for a Green India- Ministry of Environment and Climate Change

1	Scheme	Enhancing tree cover in urban and peri urban areas (including institutional lands)			
2	Instrument Type	Grant			
3	Sectors/ projects	Tree Plantation & Biodiversity			
4	Climate smart activity	Adaptation and Mitigation			
5	Eligibility	502 cities			
6	Process	ULB> District> State> Mission Directorate			
7	Grant size	Cumulative Grant- as per the action plan- Scheme Size- INR 50,000 Cr.			
8	City Access	Indirect through multi tier structures			

National Mission on Electric Mobility- Department of Heavy Industries, GoI

1	Scheme	FAME India Scheme Phase II			
2	Instrument Type	Grant			
3	Sectors/ projects	Transport- E-mobility EV Charging Infrastructure			
4	Climate smart activity	Mitigation			
5	Eligibility	ULBs (charging infra and e-buses); Individual vehicle owners			
6	Process	ULB> DHI (EV charging infra and Electric-buses) Direct to manufacturer			
7	Grant size	Cumulative Grant- INR 10,000 Cr.			
8	City Access	Direct: through Department of Heavy Industries			

National Adaptation Fund for Climate Change (NAFCC), MoEFCC

1	Scheme	NAFCC- Implementation Partner NABARD- National Implementation Entity (NIE)			
2	Instrument Type	Grant			
3	Sectors/ projects	Concrete Adaptation Measures Project preparation support			
4	Climate smart activity	Adaptation			

5	Eligibility	Concrete adaptation projects/programmes aligned with the relevant Missions under NAPCC and the SAPCCs in agriculture, horticulture, agroforestry, environment, allied activities, water, forestry, urban , coastal and low-lying system, disaster management, human health, marine system, tourism, habitat sector and other rural livelihood sectors to address climate change related issues.
6	Process	Concept note to be prepared by State Govt in consultation with NIE and sent to Technical Steering Committee of MoEFCC> DPR> approval of State level steering committee> approval of National steering committee on climate change
7	Grant size	INR 80 Cr. (BE 2021)
8	City Access	Indirect: Through State Implementation Agency

Specialised Financial Institutions (SFI) and Other National Institutions

In order to provide financial support to meet public policy objectives, the Government of India has set up multiple Specialised Financial/ Development Finance Institutions and PSEs (Public Sector Enterprises). These institutions being independent entities are poised to raise funds from public funding, capital markets, international development finance institutions at cheaper rates. Hence, are able to provide finance for development purposes. They provide finance through the following products.

- Grants: Specific to an activity, not needed to be paid back.
- Concessional Loans: at more favourable terms and rates than the market
- Equity: SFIs/ DFIs may take equity exposure in project SPVs
- Guarantees: Assurance to repay debt/ part of debt in case of default for a fee/ premium
- Other Risk management products: Currency swaps and interest rate caps

While majority of the SFIs funding are not tied to climate change objectives, but some of them have niche focus towards sectors like Renewable Energy and

1. Housing and Urban Development Corporation (HUDCO)

Housing and Urban Development Corporation Limited is a government-owned corporation under the aegis of Ministry of Housing and Urban Affairs, Government of India. HUDCO provides financing for housing development to various stakeholders and urban infrastructure projects specific to State Governments and ULB. Below table summarizes the sector and loan products of HUDCO:

Table 3: Snapshot HUDCO Urban Loans

1	Entity	HUDCO
2	Instrument Type	Loan
3	Sectors/ projects	Urban Infrastructure: Sewerage, Water Supply, Road Transport, Power, Drainage among others
4	Climate smart activity	Mitigation and Adaptation
5	Eligibility	ULB/ Development Authority/ Smart City SPV- (state support may be required in case of lower credit rating of ULB)
6	Process	Loan origination through regional HUDCO office
7	Loan Size	Case by case
8	City Access	Direct
9	Cost of financing	10-11%

2. India Renewable Energy Development Authority (IREDA)

Indian Renewable Energy Development Agency Limited (IREDA) is a public sector enterprise under the aegis of Ministry of New and Renewable Energy (MNRE). It is a 'Public Finance Institution' established as Non-Banking Financing Institutions engaged in promoting, developing and extending financial assistance for setting up projects relating to new and renewable sources of energy and energy efficiency/conservation.

Table 4: Snapshot IREDA RE Financing facility

1	Entity	IREDA
2	Instrument Type	Loan
3	Sectors/ projects	Renewable Energy: Wind, Hydro, Solar, Waste to Energy, Energy Efficiency and Conservation
4	Climate smart activity	Mitigation
5	Eligibility	Private Sector Developer, ULB, SPV, State Corporations, Utilities
6	Process	Specific process for each category of the project
7	Loan Size	INR 50 Lakhs (minimum loan size)
8	City Access	Direct
9	Cost of financing	9-12%

3. Energy Efficiency Services Limited (EESL)

Energy Efficiency Services Limited (EESL) is a Super Energy Service Company (ESCO), which enables consumers, industries and governments to effectively manage their energy needs through energy efficient technologies. EESL is implementing the world's largest energy efficiency portfolio across sectors like lighting, buildings, electric mobility, smart metering, agriculture, etc. at a scale which no organization has been able to achieve. EESL is promoted by Ministry of Power, Government of India as a Joint Venture of four reputed public- sector undertakings.

Table 5: Snapshot EESL ESCO Financing

1	Entity	EESL
2	Instrument Type	Equity recovered through Pay as you save (PAYS) model
3	Sectors/ projects	Transport (EVs), Street Lighting, Energy Efficient buildings, Energy efficient water pumps, Solar
4	Climate smart activity	Mitigation
5	Eligibility	Private Sector Developer, ULB, SPV, State Corporations, Utilities
6	Process	State/ ULB level ESCO contract arrangement
7	Loan Size	Dependent on case to case basis
8	City Access	Direct

4. National Bank for Agriculture and Rural Development (NABARD)

National Bank for Agriculture and Rural Development as the name suggests is a national level financial institution for agriculture and rural development under jurisdiction of the Ministry of Finance, Government of India. NABARD is also the national implementation entity for National Adaptation Fund for Climate Change, UN Adaptation Fund and Green Climate Fund.

Table 6: Snapshot NABARD Adaptation Financing

1	Entity	EESL
2	Instrument Type	Equity recovered through Pay as you save (PAYS) model
3	Sectors/ projects	Transport (EVs), Street Lighting, Energy Efficient buildings, Energy efficient water pumps, Solar
4	Climate smart activity	Mitigation
5	Eligibility	Private Sector Developer, ULB, SPV, State Corporations, Utilities
6	Process	State/ ULB level ESCO contract arrangement
7	Loan Size	Dependent on case to case basis
8	City Access	Direct

5. State level Institutional for Urban Infrastructure Financing

Most States in India have set up state level financial institutions/ NBFCs to raise funds for urban infrastructure projects. These agencies generally act as entities to raise aggregate finance at the state level for similar projects under different Urban Local Bodies acting as an aggregation vehicle. While the focus of these vehicles is not restricted to climate objectives but they do contribute to raise finance for climate mitigation and adaptation projects. Some of the agencies at state level agencies providing finance to ULBs in various states are:

Table 7: Snapshot NABARD Adaptation Financing

1	Entity	Tamil Nadu Urban Infrastructure Financial Services Limited
2	Instrument Type	Concessional Loans and Project Preparation Grant
3	Sectors/ projects	Sustainable Urban Infrastructure
4	Climate smart activity	Mitigation and Adaptation
5	Eligibility	ULBs of Tamil Nadu
6	Process	<ul style="list-style-type: none"> Multiple funds managed by TNUIFSL which ULBs can directly approach the agency for: Tamil Nadu Sustainable Development Project (World Bank) Sustainable Municipal Infrastructure Financing (SMIF)- Tamil Nadu (KfW)- Water supply, sewerage and other facilities Tamil Nadu Urban Flagship Investment Program (ADB)- loans for climate resilient urban infrastructure and innovative pilot urban solutions Project Development Grant Fund- GoTN- to prepare project for multilateral funding Project Sustainability Grant Fund- GoTN- Viability gap for urban infrastructure projects Chennai Mega City Development Fund- GoTN- Basic urban services in Chennai and sub urban areas Tamil Nadu Urban Road Infrastructure Development Fund- improvement of urban road and related infrastructure Water and Sanitation Pooled Fund- to raise funds from capital markets

7	Loan Size	Dependent on case to case basis
8	City Access	Direct

Other State Entities

1	Gujarat	Gujarat State Financial Services (GSFS)- Short to medium term loans
2	Rajasthan	Rajasthan Urban Drinking Water Sewerage & Infrastructure Corporation Limited

3.1.2 Municipal Own Sources

ULBs in India have various tax and non-tax streams to collect revenues from citizens and businesses within their jurisdiction. These revenues are also called the own revenues of cities which are used generally for day to day operations. The broad categories of own source revenues for cities include:

1. User Charges for municipal services - water, waste management, road cutting, parking among others
2. Development Charges: on project developer to provide basic provision of infrastructure in a new development or to capture land value appreciation due to municipal projects
3. Taxes: Predominantly property tax or house tax
4. Other Sources: Rentals, Sale of municipal property, licenses, permits among others

Generally, all above own sources of revenues are not directly related to climate resilient infrastructure projects. These sources can be considered as a source of urban climate finance in following cases:

1. User Charges is for an infrastructure provision which is low carbon and climate resilient for example - Scientific disposal of Solid Waste, building water resilience or the additional revenues generated are used for climate smart infrastructure
2. Portion of tax revenues which are collected are allocated to the "Climate Budget" of ULB used for climate smart infrastructure
3. Portion of above sources is escrowed to raise finance climate smart infrastructure projects

Given, cash flows from municipal sources are scattered over the year, they are more appropriate to pay for less capital intensive activities like project preparation, operations and maintenance and debt service among others.

3.1.3 International Sources of Climate Finance

Development Finance Institutions (DFIs) including multilateral & bilateral agencies and climate funds are one of the major international sources of urban climate finance in India. However, in general these institutions/ funds work with the national governments/ state government and may not be accessible directly to the Urban Local Bodies. These institutions provide urban finance in the form of (a) Grants (b) Concessional Loans (c) Guarantees (d) Technical assistance and (e) Equity. The instrument mix is dependent on the funding source such as:

- Climate Funds- use mainly grants and concessional loans
- Development Financial Institutions- predominantly use concessional loans but also use grants, guarantees and other instruments
- Multi donor initiatives

Bilateral and multilateral development banks

Bilateral and multilateral development finance banks generally do not engage with ULBs and channel finance through sovereign loans, public and private banks, specific urban development funds and/ or private sector lending. Below matrix maps the development financial institutions active in urban infrastructure finance sector in India:

Table 8: Snapshot financing from MDB/BDBs

	Institutions	Type of Instrument	Sector	Eligibility and access to City
1	World Bank	Loans (IBRD) & Credits (IDA) with sovereign guarantee a. Specific Investment Loan (SIL)- on an infrastructure b. Subnational Development Policy Lending (DPL) c. Technical Assistance	Sustainable Urban Infrastructure- Agnostic	Indian cities eligible- indirect through central govt.
2	Asian Development Bank	Urban Financing Partnership Facility a. Technical Assistance b. Guarantees c. Investment d. Loans	Climate Smart Urban Infrastructure	Indian cities eligible- indirect through central govt.
3	KfW development bank	a. Concessional Loans b. TA tied concessional loans c. Line of Credit	RE, EE, Sustainable Urban Development . Nature based solutions	Indian cities eligible- indirect through central govt. Line of credit- may be obtained through partner financial institutions
4	AfD	a. Concessional Loans b. Technical assistance c. Grants	RE, EE, Reinventing cities transport , energy, waste and waste management	Indian cities eligible- indirect through central govt.



Climate funds

Climate funds generally do not have a direct access for local government, the finance is routed through accredited implementing entities including international organizations (UN agencies, development banks) or regional and national entities (National focal points). These agencies are responsible for pre-screening the proposal for the funds and provide advisory in development of the proposal. For ULBs to access funding from these funds they need to jointly prepare proposals with national focal points. These funds generally provide finance through a blended approach i.e. a mix of grant and concessional debt. Some of the funds which can be accessed by cities in India are:

Table 8: Snapshot financing from MDB/BDBs

	Institutions	Relevant Themes	Sector	Support	Eligibility and access to City
1	Adaptation Fund (AF)	Urban Development and Water Management	Adaptation	TA Grant Financing	Designated Authority: MoEFCC NABARD (NIE) - proposal and concept to be submitted through NABARD.
2	Clean Technology Fund	Energy, industry, transport and building sectors	Mitigation	TA Concessional Loans Grants	CTF projects are need to be part of a national level investment plan Cities cannot directly access funds from CTF
3	Global Environment Facility (GEF)	Biodiversity, Climate Change Mitigation, International Waters, Land Degradation, Chemicals and Waste, Sustainable Forest Management)	Mitigation and Adaptation	TA Grants and project funding grants	Project in GEF are proposed through Official Focal Point (OF) in India the OF is from Ministry of Finance and Ministry of environment and climate change
4	Green Climate Fund	8 impact areas related to mitigation, adaptation and sustainable development. Low carbon and climate resilient infrastructure	Mitigation and Adaptation	TA Concessional Loans Grants, Guarantees and Equity	Through National Designated Authorities- Ministry of environment and climate change or Accredited Entities: NABARD, SIDBI, Yes Bank, IDFC Bank, IL&FS environment
5	Special Climate Change Fund (SCCF)	Adaptation and technology transfer	Adaptation	TA and grants	Propose SCCF project with ADB, World Bank, WWF and get endorsement of GEF operational focal points
Funds under ADB Urban Financing Partnership Relevant Themes Sector Support Eligibility and access to City					
1	Urban Climate Change Resilience Trust Fund	Urban climate resilient project- Energy-efficiency, renewable energy, public transport/mobility, green transport/ electric vehicles, waste management, water supply and treatment	Mitigation and Adaptation	TA for project preparation and knowledge sharing	Through ADB Operational team
2	Cities Development Initiative for Asia	Urban transport, water supply, waste water management, solid waste management, urban renewal, social infra, energy efficiency	Mitigation and Adaptation	TA for project preparation and knowledge sharing	Through CDIA website

Multi donor initiatives

Apart from the traditional financing products and climate fund, the development finance institution collaborates and participates in multi donor initiatives, such initiatives focus on overcoming key challenges for the city in planning, financing and implementation of urban infrastructure projects. Below is a taxonomy of such initiatives which are fully or partially accessible to Indian cities:

Table 10: Snapshot of Project Preparation Facilities

	Institutions	Relevant Themes	Sector	Support	Eligibility and access to City
1	C40 Cities Finance Facility	Technical Assistance: Project Preparation, Capacity Development and Knowledge Sharing	Urban climate change investment project	Bengaluru; Chennai; Delhi NCT; Jaipur; Kolkata and Mumbai.	Bloomberg Philanthropies, BMU, UK BEIS among other
2	District Energy in Cities Initiative	Technical Assistance and project preparation	Green Building, Energy Efficiency	Amaravati, Bhopal, Coimbatore, Pune, Rajkot and Thane	World Bank, UNEP, GEF
3	Financing Sustainable Cities Initiative	Technical assistance in business models and knowledge sharing	Bike Sharing, BRT, ebuses, EE, TOD, Waste to energy	Bengaluru; Chennai; Delhi NCT; Jaipur; Kolkata and Mumbai.	Citi Foundation
4	Fund for technical expertise and experience transfers	Technical assistance: Project Preparation Studies	Urban climate change investment project	Cities through Government of India	AFD
5	Subnational technical assistance program-PPIAF	Technical assistance for PPP project and improving credit worthiness of ULBs	EE, RE, Waste management, water supply	Cities through PPIAF website	World Bank and other donor agencies
6	Mobilise your city	Technical assistance for Urban Mobility Plans and access to financing for projects	Urban Mobility	Nagpur, Kochi, Ahmedabad	EU, AFD, BMU

Other Sources of International Climate Finance

Country level partnerships

With an objective to support climate smart urbanisation multiple countries have partnered with India/ Indian cities to share their learning and expertise. These country level partnerships also stimulate urban climate finance through technical assistance in specific areas and direct investment in pilots. These country partnerships are thematic addressing to build capacities of cities or specific city to city pairing. Some of the active country level partnerships are:

- US Treasury support to 5 Indian cities in accessing finance from Debt Capital Market by issuance of Municipal Bonds
- SDC support to 8 Indian cities and states in building capacities for low carbon and climate resilient city development
- EU-IUCN support to cities in climate action planning
- Royal Danish Embassy support to two Indian cities to identify and implement sustainable urban solutions

Relevance to Urban Climate Finance

Generally partnerships are focused towards building capacities of city officials to overcome barriers to access urban climate finance. Also, under some of the partnerships a small grant for pilot demonstration projects is also tied up for development of climate resilient infrastructure.

Internationally Transferred Mitigation Outcomes (ITMOs)

Article 6 of the UNFCCC Paris Agreement provides a framework for international cooperation and support with the objective of allowing countries to implement climate actions above their domestically funded NDCs. Article 6 also introduces New Market Mechanisms (NMMs) for the post-2020 climate cooperation framework, including a possibility for the international transfer of mitigation outcomes (so-called 'ITMOs') mentioned in Article 6.2. The Paris Agreement, and especially Article 6.2, has profoundly changed the means by which Parties and the private sector cooperate in the origination of mitigation outcomes to meet their respective NDCs.

Relevance to Urban Climate Finance

ITMOs can be a potential blended source of international urban climate finance, wherein cities receive investments for development of various climate smart infrastructure projects with measurable Mitigation Outcomes generating ITMOs purchased by an interested country. While in India, no project under Article 6 has been executed but other countries in SEA have seen some success. Below is a case study of Thailand using ITMO based financing for promoting electric mobility.

Case Study : Using Article 6.2 to scale e-mobility and battery storage in Thailand

Project Context: Switzerland and Thailand are exploring cooperation for joint climate action using Article 6.2 of the Paris Agreement for international carbon transactions, wherein Switzerland would buy ITMOs (as a result-based finance mechanism) to enable e-mobility penetration from Thailand. These ITMOs can then be used towards National reporting of Switzerland.

Barriers identified for scaled-up e-mobility

- High marginal CapEx investment for EV prevent adoption of large fleets
- Lack of charging infrastructure reduces user confidence (range anxiety)
- Distributed assets and ownership complicate financing

Proposed solution

A pilot program that applies international carbon mechanisms to scale finance for the adoption of Electric Vehicles (EV) in Thailand:

- De-risk commercial investments into critical charging infrastructure and vehicles, through results-based carbon payments for avoided use of fossil fuels thereby reducing marginal CapEx and stimulating investments in charging infrastructure
- Digital Monitoring, Reporting and Verification to aggregate small-scale projects, reduce monitoring costs, increase transparency around ownership and energy source and accelerate carbon project cycles.



Case Study 1: Article 6 project in Thailand

3.2 Private Sources of Urban Climate Finance

The private sources of climate finance to cities broadly include debt finance through commercial banks and debt capital markets, equity finance through private developers, private equity, infra funds and other sources such as philanthropic finance, carbon markets and impact funds. These sources provide climate finance to cities through varied financial instruments. The key sources along with the type of instruments have been outlined in the figure below: source of urban climate finance.

Private sources:

Commercial Finance Institution	<ul style="list-style-type: none"> Scheduled Commercial Banks- Green lending International Development Finance Institutions Institutional Investors- Insurance cos, pension funds 	Loans and Guarantees
Debt Capital Market Investors	<ul style="list-style-type: none"> Municipal Bonds Green/ Climate Bonds 	Loans with bullet payment
Equity Investors	<ul style="list-style-type: none"> Private Equity Investors (through SPV) Infrastructure Funds Project Developers (under various PPP formats) .IaaS- Infrastructure as as service 	Investment against returns
Other Private Climate Finance sources	<ul style="list-style-type: none"> (Inter)national philanthropic finance Voluntary Carbon Markets Impact Funds 	Grants, Guarantees, Concessional lending and financing

3.2.1 Commercial Finance Institution- Green Loans

Green Loan is a loan issued by banks, financing institutions for implementation of green projects or activities that are aligned with a set of defined green criteria. The green loan can be funded like any other loan or from proceeds from green bonds. The Green Loan Principles (GLP) were developed in 2018 by leading lenders which were most active in the green loan market. The GLP are voluntary and recommended guidelines and set out a clear framework, enabling all market participants to clearly understand the characteristics of a green loan. The GLP provides consistent methodology across the wholesale green loan market and it broadly covers a) use of proceeds; b) process of evaluation and selection of projects c) management of proceeds; and d) reporting. The use of proceeds of green loans should be clearly described, specifically the environmental benefits of the projects.

Relevance to Urban Climate Finance

The commercial finance institutions often manage green credit lines from bilateral and multilateral development banks through which the green loans are financed. Currently the Private sector banks and financial institutions have a limited exposure to urban infrastructure financing as the nature of financing requires a longer tenor and the implied credit risk of the ULBs. Mostly, the banks follow a structured finance approach for urban infrastructure financing i.e. through escrowing multiple cash flows of ULB and maintaining an appropriate DSRA. On the other hand, green finance for private sector developers under PPP arrangements for green projects is widely available through private sector banks and specialised NBFCs. The green loans are accessible to ULBs, SPVs and private sector developers. Green loans help in fostering communication and awareness of climate finance amongst these groups. It helps in financing sustainable activities.

Table 11: Snapshot financing through Green Loans

1	Entity	Private sector banks, NBFCs
2	Instrument Type	Loans (at commercial rates)
3	Sectors/ projects	RE, EE, Low carbon transport, waste to energy
4	Climate smart activity	Mostly Mitigation activities- with cash flow attached
5	Eligibility	Minimum credit rating, cash flows, sinking fund, project qualifying under bank green lending terms
6	Process	Loan application to be made through Bank/ NBFC Relationship Manager
7	Project Size	Dependent on case to case basis
8	City Access	Direct- support in form of guarantees may be required
10	Cost of financing	10-15% (dependent on credit ratings)+ one time 0.5% arrangement cost

3.2.2 Debt Capital Markets- Green Municipal bonds

Cities/ Urban developers may raise financing through the issuance of green municipal bonds. A green bond is a municipal bond specifically earmarked to be used for climate and environmental projects or activities that are aligned with a set of defined green criteria. They are like the other bonds; however, the only difference is that they adhere to the issuance of environmental or sustainable projects. Climate bonds are a sub-component of the green bond and are issued for projects with a mitigation/adaptation impact.

An issuer of green bonds typically needs to fulfil a certain credit rating standard and adhere to national green bond issuance regulations. Although green bonds issuance may have additional transaction costs for issuers (i.e., for tracking, monitoring, and reporting the use of proceeds), the benefits of green bonds can offset such costs. These benefits include highlighting their green assets/business, good marketing and diversifying their investor base as they can now attract Responsible Investment specialist investors. Investors have huge demands for green bonds as they can fund green projects without taking any additional risks and they will know the exact sustainable impacts of their investments.

3.2.2.1 Types of green bonds

The figure below describes the types of green bonds that exists:



Figure 10: Type of Green Bonds

3.2.2.2 How can green bonds finance climate smart infrastructure

As we learnt in the previous sections, the development of climate smart infrastructure requires large amounts of investments till 2030. For this reason, green bonds are a great option for climate smart infrastructure as they are stable and long-term investment sources. The recourse arrangement for the bond can be as per the above types of bonds. Given below is a table that showcases the project that can be taken up by green municipal bonds in line with Green Bond Principles:

Table 12: Eligible projects under green bonds

Category	Eligible Projects
Energy	Renewable energy based or Energy efficient (LED) street lighting, public spaces lighting, and commercial lighting
Waste Management	Sewage treatment facilities with methane capture, Low-emission garbage tracks and related infrastructure, Recycling plants, Qualifying waste-to-energy generation
Green Infrastructure	LEED certified buildings (gold and above recommended), Energy efficiency and conservation projects in buildings, Rehabilitation of transmission facilities to reduce greenhouse gas emissions, Public housing built to high energy efficiency standards
Clean Transportation	Mass transit: subways, light rail, Rolling stock for railways, Rail track capital expenditure, Electric vehicle infrastructure, vehicle fleets, consumer loans, Bus Rapid Transit Systems (minimum ITDP bronze rated), Zero-and low-emission vehicle fleets

Table 13: Snapshot financing through Green Bonds

1	Entity	Through Debt Capital Markets
2	Instrument Type	Bonds
3	Sectors/ projects	As mentioned above
4	Climate smart activity	Mostly Mitigation activities- with cash flow attached
5	Eligibility	SEBI Requirements for issue of municipal bonds, SEBI (Issue and Listing of Debt Securities by Municipality) Regulations, 2015 Green Bond Principles and Climate Bond Standards
6	Process	Project identification, draft instrument structure (with or without credit enhancements), instrument rating, appointment of merchant banker (Detailed process note in annexure)
7	Project Size	Dependent on case to case basis
8	City Access	Direct- support in form of guarantees may be required
10	Cost of financing	8-13% + 2-3% one time arranger fees

Case Study : Ghaziabad municipal corporation to be first city in India to issue green bonds

Project Context: Ghaziabad Municipal Corporation, a civic body in Uttar Pradesh needed an external financing of ~INR 200 Cr. for development of tertiary water treatment plan to serve nearby industrial area.

Barriers identified for scaled-up e-mobility: The civicbody did not had any past experience in mobilising external debt finance, the standalone credit rating for the civic body was A(-).

Solution and Outcome: GMC successfully raised green bonds worth ~INR 150 Cr. (@ 8.1%) for the project, to overcome the credit rating barrier through multiple credit enhancement mechanism, the instrument was rated AA and subscribed 2 time. Credit enhancement applied:

- Structuring an infrastructure development fund (transfers from state and national govt) as an additional cushion to bond holders
- Escrowing the property tax collected by Ghaziabad Municipal Corporations and revenue grand transferred by State Government
- Loading up upfront Debt Service Reserve account for 2 years of interest payment



Case Study 2: Green Bonds

Relevance to Urban Climate Finance

The municipal debt capital market in India is still at nascent stage with limited transaction volume, over the last decade aggregate USD 205 millions of funds have been mobilized through taxable bonds, tax free bonds and pooled financing vehicles. More recently in the last decade through multiple reforms and incentives a momentum has been created in the market. Green municipal bond have a potential of financing large investment for green and climate resilient urban infrastructure. While the funds raised in India through green bonds have been limited, recently the first municipal green bond issue was successfully completed by an Indian city.

The key barrier towards accessing finance through green bonds is lack of creditworthiness, no pipeline of bankable projects, limited operational capacities of city officials. Although green bonds have a strong potential as an innovative financing mechanism for Municipal Corporations in financing green infrastructure projects these barriers are needed to be addressed. While some of these barriers can addressed through active capacity building and building awareness. Issues like credit rating can also be addressed through structured credit enhancement approaches.

3.2.3 Philanthropy and Carbon Financing

Impact funds

An impact fund is defined as a fund that aims to implement investments that generate a measurable, beneficial social and/or environmental impact in addition to a financial return². Investors and asset owners of impact funds range from corporations, governments, retail investors, foundations, and high-net-worth individual families. Players such as investment advisors, fund managers, banks, development finance institutions, venture funds manage the asset while the investment recipients could include corporations, small-to-medium businesses, cooperatives, microfinance institutions and social enterprises³.

Given below are some of the project types for impact funds:






Sector					
Examples	Community- based biogas Small and micro solar PV Cookstoves	Forest conservation & rehabilitation Afforestation	Low-carbon & climate-resilient agriculture Farmer training Women's empowerment	Water management Water sanitation Toilets	Landscape resilience to extreme weather events
Impact	Reduced GHG emissions Improved resilience to power outages	Reduced GHG emissions Protection of nearby power outages land (e.g. landslides)	Reduce GHG emissions Improved productions predictability	Reduced water impact and dependence	Protection of nearby land (e.g. from landslides) Improved resource availability

Figure 11: Theme areas for impact funds

Source: South Pole, 2020

Relevance to Urban Climate Finance

Impact funds can become potential funding partner to the private sector developer/ solution providers to the city. While such fund do not directly invest in cities but through financing private sector in development of low carbon infrastructure can play a key role in the urban climate finance landscape. In fact, India is fast becoming a major destination for impact investments. Between 2010 and 2016, India attracted over USD 5.2 billion from over 50 impact investors. Between 2014- 2016, 40% of these investments were used to fund clean projects such as wind, solar and small hydropower generation⁴. The impact investment paradigm in India is led by names such as Aavishkaar group, Omidyar network, Elevator Equity, Unitus ventures, Acumen and so on⁵.

² <https://www.igfi-global.com/dictionary/impact-fund/48336>

³ <https://bthechange.com/15-companies-making-a-difference-with-impact-investing-9f3752774cc7>

⁴ <https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/impact-investing-finds-its-place-in-india>

⁵ <https://www.orfonline.org/expert-speak/impact-investments-in-india-686172>

Table 14: Impact fund snapshot

1	Entity	Impact Fund
2	Instrument Type	Equity/ Concessional Loans
3	Sectors/ projects	Clean Energy, Energy Efficiency, Waste to Energy, E-mobility
4	Climate smart activity	Mostly Mitigation activities- with cash flow attached
5	Eligibility	Company/ Project with a social outcome attached
6	Process	Developers/ Urban solution providers can directly apply
7	Project Size	Dependent on case to case basis
8	City Access	Indirect- through solution provider/ developer

International Foundations

Multiple private foundations, such as Citi Foundation, Rockefeller Foundation, Bloomberg Philanthropies among other actively invest in urban climate action. These fund through various programs some of which are highlighted in section 2.1.3 primarily engage in building capacities of cities for project preparation but they also operate limited funding rounds to support pilot low carbon and climate resilient infrastructure projects through grant based funding.

Relevance to Urban Climate Finance

Majority of these funds operate through program, where in the selection of cities are made based on their internal criteria's. Hence, a city is not able to directly access/ apply for climate finance. In some of the recent programs supported by these foundations cities are able to directly apply funding through their websites.

Private sector led voluntary carbon markets

Carbon Credits

With more and more private sector companies committing to net zero/ carbon negative, the demand for carbon credits in voluntary carbon market has seen a sharp increase. This can be seen as an opportunity for Indian cities to raise additional financing through voluntary carbon markets by registering their low carbon and climate resilient infrastructure projects in globally recognized registries and obtain carbon credits. These credits can then be sold in the voluntary carbon markets to private sector companies. While there is an overall demand for carbon credits, but the demand and pricing range varies significantly from project category, sectors and wider impact created by the project beyond emission reduction/ carbon removal i.e. SDG benefits and impact of livelihood. Some of the sectors for which cities can apply for carbon credits include renewable energy, energy efficiency, low carbon waste management, urban forestry, e-mobility among others.

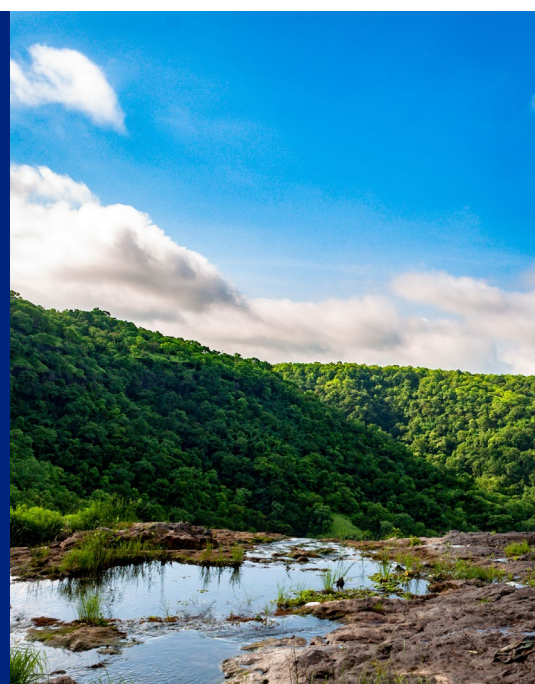
Table 15: Snapshot Carbon Credits

1	Instrument Type	Carbon Credits
2	Sectors/ projects	As stated above
3	Climate smart activity	Mitigation activities
4	Eligibility	As per the methodologies and pre conditions of standards
5	Process	Project Identification, Project Idea Note, Registration, Issuance- Detailed note in annexure
6	Project Size	Dependent on case to case basis
7	City Access	Direct- through sales of generated carbon credits

Case Study : Indore Municipal Corporation first city to raise carbon financing

Project Context: Indore Municipal Corporation, a civic body in Madhya Pradesh has undertaken several green projects towards climate change mitigation under Smart City Mission. These projects would result in significant reduction in carbon emissions which can be monetised in voluntary carbon markets.

Outcome: In 2019, Indore Municipal Corporation registered 5 projects in low carbon waste management and RE sector under VERRA carbon registry with combined estimated annual emission reduction of 2.83 lakhs tCO₂e. Carbon credits for 3 commissioned project were issued i.e. 170,407 VCUs (voluntary carbon units), which were sold in the voluntary carbon markets for a value of USD 0.5 per credit. IMC would get an additional revenue of ~ INR 50 lakhs per year from these project.



Case Study 3: Carbon Credits

Plastic Credits

Akin to Carbon credits ,plastic credits are a financial instrument for organisations to finance plastic waste collection and recycling activities. Plastic credits are measurable, verifiable, and transferable units, representing a specific quantity of plastic that has been collected from the environment or recycled. Plastic waste that is collected and then recycled, reduces the need for virgin plastic used in the manufacturing process of certain materials. There are two types of credits that are collectively known as plastic credits. Once verified, projects that enable plastic to be collected from the environment may be issued Waste Collection Credits (WCCs) and projects that enable plastic to be recycled may be issued Waste Recycling Credits (WRCs). Plastic credits can be purchased by companies as part of wider activities to address plastic use and management. The standard value of 1 plastic credit is 1 metric ton of the plastic waste either collected (i.e. reduced from reaching the environment) or recycled (producing recycled materials to replace virgin plastic that is otherwise used for manufacturing and other industries). Cities can use plastic credits to mobilise financing from local and international private sector companies which have significant plastic footprint in India.

Table 16: Snapshot Plastic Credits

1	Instrument Type	Carbon Credits
2	Sectors/ projects	Solid Waste Management: Plastic Waste collection and recycling activities
3	Climate smart activity	Mitigation activities
4	Eligibility	As per VERRA Plastic Waste Reduction Standards
5	Process	Project Identification, Project Idea Note, Registration, Issuance- Detailed note in annexure
6	Project Size	Dependent on case to case basis
7	City Access	Direct- through sales of generated plastic credits

3.3 Summary funding across project preparation and implementation stages

The above section maps the available public and private sources of urban climate finance along with the facilities providing technical assistance. The table below summarises the above sources/ instruments/ facilities as per their applicability at different stages of project preparation and implementation.

Table 17: Snapshot Plastic Credits

Project Stage	Potential Sources
Preparation- Concept, prefeasibility (business case) and feasibility	<ul style="list-style-type: none"> Government Conditional Transfers (TA) Municipal own sources revenues National development banks (grants/ TA) Bilateral/ Multilateral development bank (grants/ TA) Climate fund (grants/ TA) Multi-donor project preparation facilities Philanthropic programs
Construction and Implementation	<ul style="list-style-type: none"> Government transfers, own revenue source (if possible) Specialised financial institutions (loans, equity, guarantees, credit enhancements) Bilateral/ Multilateral development banks (loans with sovereign guarantees) Climate fund (grants for adaptation projects, concessional loansthrough Implementation entity) Private finance (Loans, green bonds, impact funds, PPP) Other sources- carbon credits and plastic credits
Operations & Maintenance/ Debt Service	Own revenue source/ assigned revenues
Refurbishment / Renewal	Specialised financial institutions (refinancing) <ul style="list-style-type: none"> Private finance Municipal own sources

3.4 Further Reading

- Introduction to climate finance by UNFCCC
- The State of Cities climate finance by CPI

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