

Navigating India's EV Financing Landscape

A Scoping Report for the Zero Emission Vehicles (ZEV)
Country Pilot Project with India under the ZEV Transition Council



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Contents

1. Introduction	6
1.1 Report Objective	6
1.2 The Transition in India to Electric Mobility	7
1.3 Global Climate Finance and Transportation in India	10
2. Landscape of International EV Financing Initiatives in India	11
2.1 Distribution of Financing Instruments	12
2.2 Expected Outcomes	15
3. Key Vehicle Electrification Projects Supported by International Finance	16
3.1 India E-mobility financing program	16
3.2 Green Growth Equity Fund (GGEF)	18
3.3 Electrifying Mobility in Cities: Investing in the Transformation to Electric Mobility in India	19
3.4 Program for Transformative Mobility and Battery Storage: Environmental and Social Systems Assessment	21
3.5 Global Facility to Decarbonize Transport (GFDT): Accelerating E-Mobility in India	22
3.6 GreenCell Electric Bus Financing Project	22
3.7 India: Sustainable Transport Financing	24
4. Private Sector Financing Projects	25
4.1 Napino Auto and Electronics Limited	25
4.2 Mahindra Last-Mile Mobility (LMM) Company	25
4.3 Ather Energy Private Limited	25
5. Bilateral and other Independent Sponsor Funded Projects	26
5.1 British International Investment (BII) and Mahindra & Mahindra Ltd (M&M)	26
5.2 SIDBI and Shell Foundation Risk Sharing Facility (RSF)	26
5.3 Climate-friendly Modernisation of Urban Public Transport in Tamil Nadu	26
5.4 USAID e-buses financing in India	26
6. Enhancing State EV Policy Action for an outcome-based financing mechanism	27
7. Way Forward	28
References	34
Endnotes: Project information source documents	34

Introduction

1.1 Report Objective

While global vehicle electrification shares have grown significantly crossing 14% of new light duty vehicle (LDV) sales in the first half of 2023, emerging markets and developing economies (EMDEs) – with the exception of China are still lagging the Zero Emission Vehicle (ZEV) transition. The Breakthrough Agenda and the ZEV Transition Council launched at COP26 under the UK Presidency highlighted the need for zero emission road transport to be the new normal in all regions by 2030, while being accessible, affordable and sustainable. In its priority actions for the road transport breakthrough in 2023, the international community called for greater policy action to accelerate EV deployment and charging infrastructure to mobilise investment. It further recommended the need for scaling technical and financial assistance to developing countries across national and sub-national governments, that will also help crowd-in private investment.

Work under this Road Transport Breakthrough priority action is being coordinated by the ZEV Transition Council (ZEVTC). As part of this, the ZEVTC launched the International Assistance Taskforce (IAT) to coordinate and scope opportunities for strengthening financing mechanisms for ZEVs and the wider support offer of international assistance available for EMDEs to accelerate this transition. Extensively shaped by the IAT's expertise as well as by wider consultations with EMDE countries, including the nearly 50 countries that participated in the ZEVTC's Regional Dialogues in 2021-22, members of the ZEVTC launched an initial package of initiatives at COP27. This included a ZEV Rapid Response Facility to provide countries with access to a broad network of world-leading experts and support providers; the ZEV Emerging Markets Initiative to foster public-private partnerships and scale investment across countries; and a new ZEV country partnership model to provide tailored support, with India being the first partner.

Since the first ZEV Country Partnership was launched by the ZEVTC co-chairs – the UK and US – and India in 2022, scoping work has taken place to identify how and where the international support and engagement received by India could be strengthened through closer collaboration and coordination. The UK has led the Partnership's 'India Country Pilot Initiative' to address areas of potential duplication and gaps in the existing international assistance offer to India. Meanwhile, the US – alongside the World Business Council for Sustainable Development – has led the Partnership's ZEV Emerging Markets Initiative India Dialogue to foster relationships between major international companies and the Government of India, as well as sub-national governments and businesses across India. This report is related to the 'India Country Pilot Initiative' specifically, although it will help inform wider activities under the Partnership.

Under the 'India Country Pilot Initiative', the UK, UC Davis and WRI India have been working together on a project that aims to address the key challenges faced by Indian State (sub-national) Governments in accessing finance for EV projects – also a key priority for the Government of India. UC Davis and WRI India, as the lead technical partners of the project, have jointly developed this report to provide an

overview of the financing landscape for e-mobility in the country, and to provide recommendations for enhancing access to finance at the sub-national level. These recommendations will inform next steps under the project, including its capacity building activities in 2024.

This initial scoping report takes stock of major international climate finance initiatives (non-exhaustive) focuses on the EV ecosystem that are ongoing in India, to better understand the type and quantum of finance being deployed, its purposes and to identify opportunities for strengthening the financial mechanisms and framework for India, to achieve the outcomes of road transport decarbonisation and ZEV market transformation.

This report also takes significance as the first Global Stocktake (GST) concluded at COP28 and focuses on enhanced climate action including on road transport, by member countries. To achieve their nationally determined contributions (NDCs) by 2030, and to strengthen their alignment with the global net zero pathway by 2050, developing countries will require access to affordable financing. At the same time, ambitious policy action by recipient governments is essential, to create an enabling environment and to de-risk the deployment of capital for financing sustainable transport transitions.

1.2 The Transition in India to Electric Mobility

At COP26, India also announced its commitment to net zero by 2070, which was further followed by a vision of achieving a differential target of EV sales across different vehicle segments. India is a signatory to the Clean Energy Ministerial's (CEM) EV 30@30 campaign, with a target of achieving at least 30% of new electric vehicle sales by 2030. As of December 2023, share of electric passenger vehicles in new sales was 1.6%, share of electric two-wheelers was 5.03%, share of electric three-wheelers (excluding e-rickshaws) was 12%, while light vans and commercial vehicles saw an EV share of 1.4% (see figure 1). **To move towards the intended ambitions of a ZEV transition by 2030, India would require a significant ramp-up in EV adoption, registering about 38% Compounded Annual Growth Rate (CAGR) between 2023 – 2030 across segments, aided by a robust policy framework and significant mobilization of both public and private financing.**

Over the past decade, the Government of India (GoI) has undertaken a comprehensive set of initiatives focused on road transport electrification, to increase market adoption of ZEVs and to promote the development of EV manufacturing in the country. The National Electric Mobility Mission Plan (NEMMP) 2020 was launched in 2013, aimed at promoting hybrid and electric vehicles to enable transport decarbonization and to achieve energy security by reducing India's dependence on crude oil imports. The Faster Adoption and Manufacturing of Hybrid and Electric Vehicles in India (FAME), launched in 2015 of which Phase 2 is ongoing, as of March 2024, allocated a total amount of INR 108.95 billion (USD 1.3 billion) in purchase and capital subsidies for EVs and charging infrastructure respectively. On the supply side, the Production Linked Incentive (PLI) schemes, for advanced chemistry cell (ACC) manufacturing for EV batteries, and for advanced auto and auto components manufacturing, have been allocated a total of INR 440.38 billion (USD 5.4 billion) to catalyse domestic manufacturing of EVs and their components.

In addition to the demand and supply side incentives for the EV ecosystem, the Government of India has also instituted policies, regulations, and standards to enable the development of a safe, sustainable and accelerated EV transition. These include the EV Charging Standards and Guidelines, the Battery Waste Management Rules 2022, Vehicle Scrappage Policy, draft Battery Swapping Policy, permit exemptions for EVs, strengthened battery testing standards, and others.

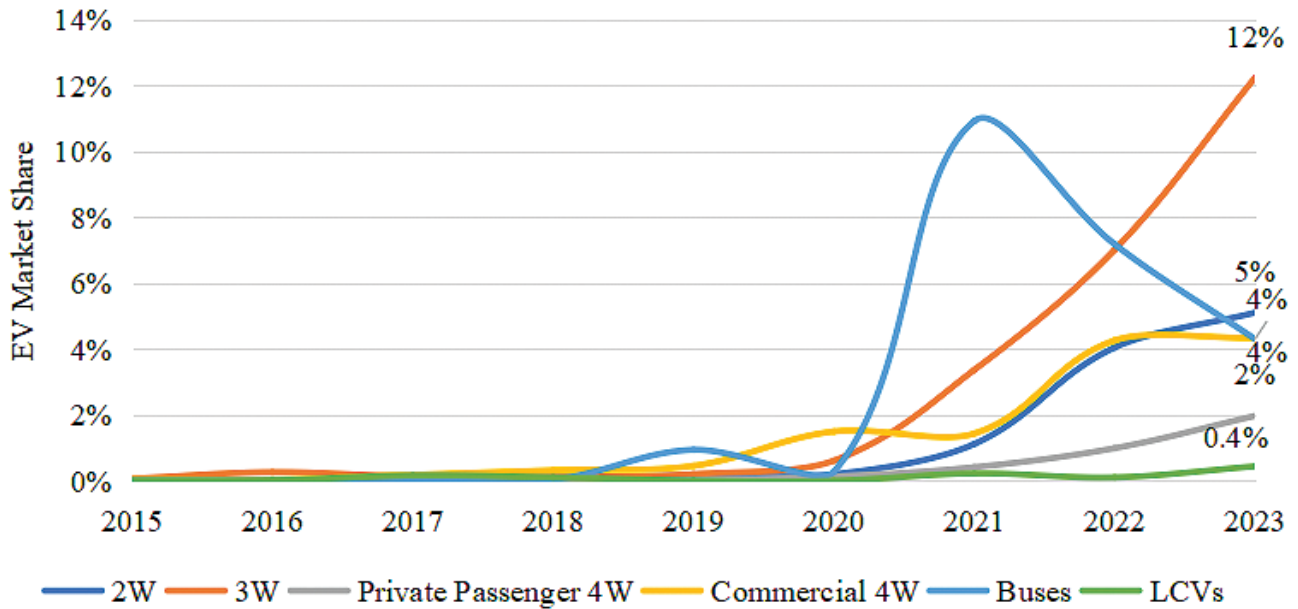
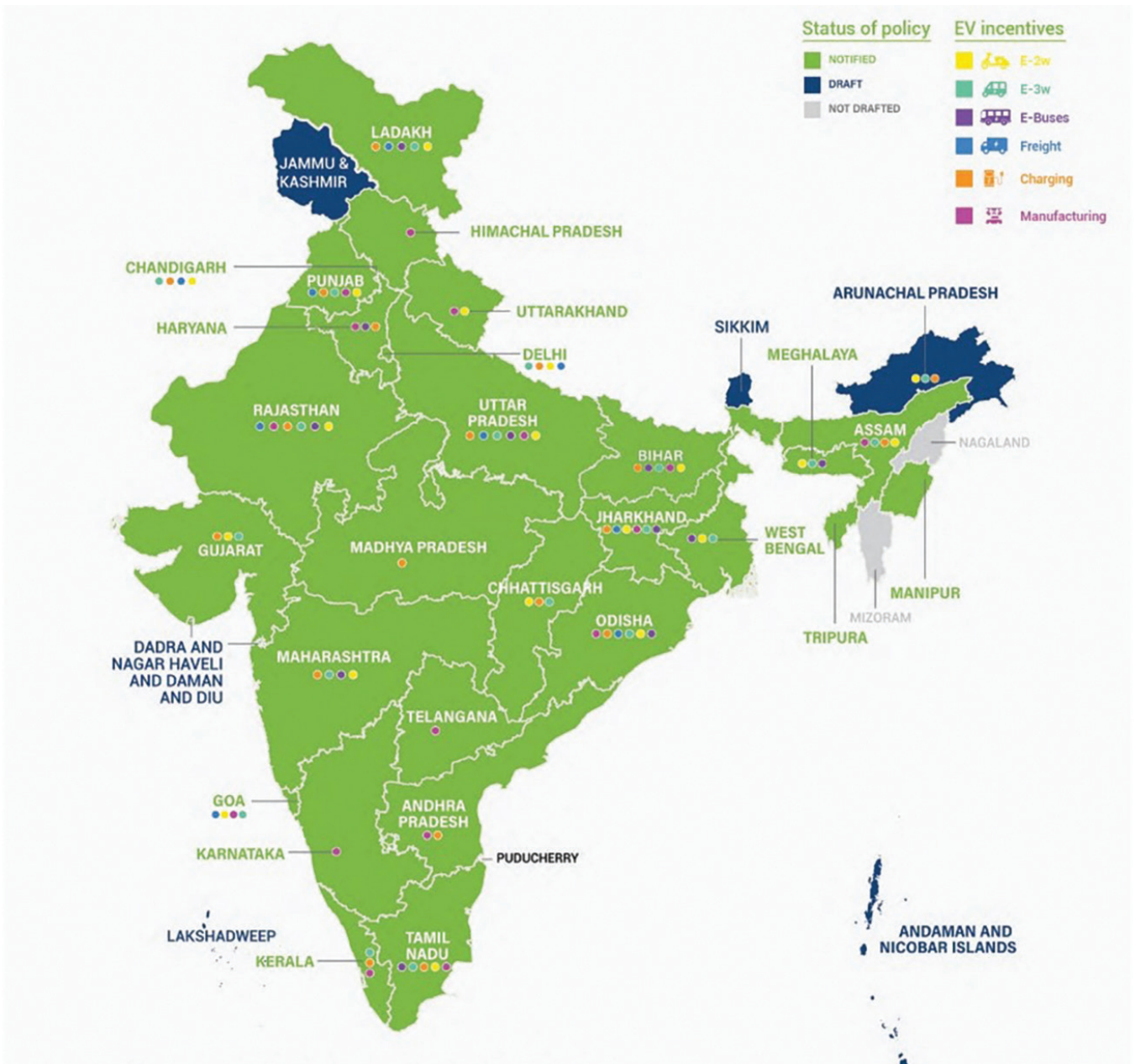


Figure 1 : EV market shares by segment from 2015 – 2023 (Jan – Nov)

Source: VAHAN Dashboard, Ministry of Road Transport and Highways, Government of India

With over 30 states and union territories (UTs) in India having their own EV policies, they are increasingly being seen as the drivers of change. Several states have robust targets in place to increase EV adoption across different vehicle segments and strengthen the supporting infrastructure. EV policies of both Delhi and Assam have set a target of achieving 25% EVs among new vehicle registrations by 2024 and 2025, respectively. Released in 2017, the Karnataka Electric Vehicle and Energy Storage policy focuses on attracting investments in EV manufacturing, R&D, and charging infrastructure. It offers incentives for manufacturers and consumers, along with promoting skill development in the EV sector. The Maharashtra State Electric Vehicle Policy 2021 has specific provisions for accelerating in the commercial fleet segment. The policy aims to have at least 25% of the urban fleet operated by aggregators including e-commerce deliveries, last mile logistics, and mobility aggregators to be electric by 2025. Launched in 2023, Tamil Nadu's EV policy focuses on increasing the share of electric buses to 30% of the fleet by 2030. Gujarat's EV policy offers subsidies for electric two-wheelers, three-wheelers, and electric cars, hence, reducing the upfront cost for buyers. Telangana's EV policy aims to make the State a manufacturing base for EVs and energy storage aiming to attract USD 4 billion and create employment opportunities for 120,000 people by 2030. In addition to offering purchase subsidies for first 100,000 EVs, Bihar is also offering 100% exemption from road tax and registration fees along with exemption from toll charges. The Policy of Uttar Pradesh seeks to target 100% transition of government vehicles to electric by 2030 and attain 100% electrification of public transportation across 17 cities by 2030. While policies across States vary in terms of incentives, targets, and focus areas, they collectively aim to promote EV adoption by providing a supportive ecosystem for both manufacturers and consumers.



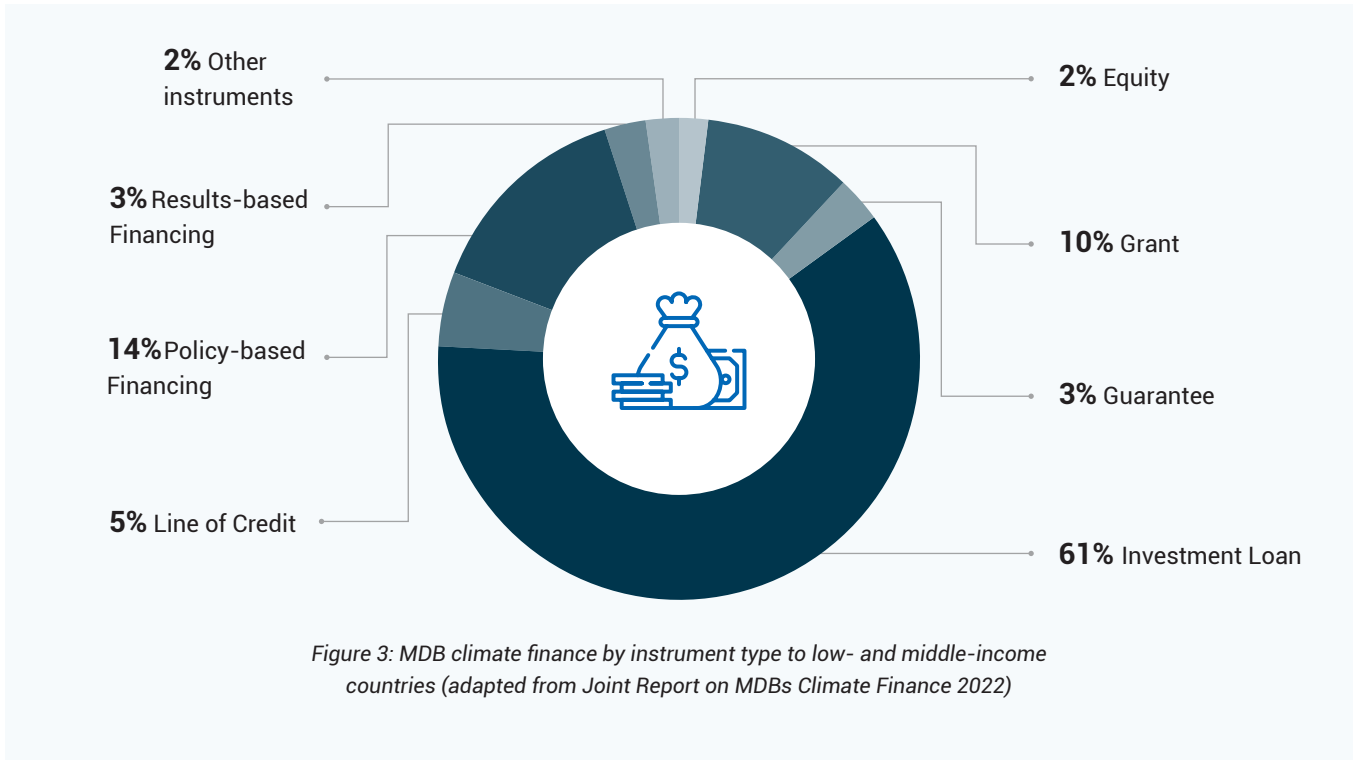
Source: Niti Aayog and state EV policies compiled by WRI India.

DISCLAIMER: This map is for illustrative purpose and does not imply the expression of any opinion on the part of WRI, concerning the legal status of any country or territory or concerning the delimitation of frontiers or boundaries.

Figure 2: Overview of State EV Policies in India (Adapted from WRI India)

1.3 Global Climate Finance and Transportation in India

According to the latest global climate finance tracking joint report, multilateral development banks (MDBs) have provided a record USD 100 billion in 2022 globally, of which about USD 61 billion was for low and middle-income countries (LMICs). Financing to developing countries was provided largely through investment loansⁱ (60%), followed by policy-based² and results-based financing³ (18%). In terms of sectors, transport (23%) was the second largest sector that was financed, after energy (31%).



Based on India's 3rd Biennial Update Report (BUR) submission to the UNFCCC (2021), thirty-six percent of climate financing flows to India during the 2015-20 period from global climate funds and MDBs were allocated to the electricity and renewables sector, followed by twenty-two percent to the transport sector. Finance to the transport sector was largely focused on road and highway projects. It should be noted that in most projects, the additionality of climate related outcomes is a relatively small share (less than 30% of total project funds allocated) and its evaluation is currently based on donor entities identifying climate-related outcomes, rather than a comprehensive and transparent Monitoring, Reporting and Verification (MRV) process.

Landscape of International EV Financing Initiatives in India

Much of the ZEV transition in India is being supported by Multilateral Development Banks (MDBs) and financial institutions, national development banks, and private financial institutions. In this scoping report, major EV finance initiatives by MDBs are mapped, which together are in the process of mobilizing of USD 3 billion to support India's ZEV transition through various projects spanning from 2021 to 2033.

This report maps thirteen existing or planned EV financing projects (Table 1), including those by the World Bank, International Finance Corporation (IFC), Asian Development Bank (ADB), UN Environment Program (UNEP), Global Environment Facility (GEF), Asian Infrastructure Investment Bank (AIIB), Green Climate Fund (GCF), as well as various private sector organisations. These institutions are working to strengthen the EV ecosystem by mobilizing investments, engaging in policy dialogues, and providing technical assistance for developing policy frameworks. Additionally, they are also investing in private entities to scale up their EV manufacturing facilities and increase infrastructure deployment to create an enabling ecosystem for accelerated EV adoption. These projects are expected to result in a range of co-benefits such as job creation and overall economic growth.

Table 1: Existing and proposed projects financing ZEV transition in India

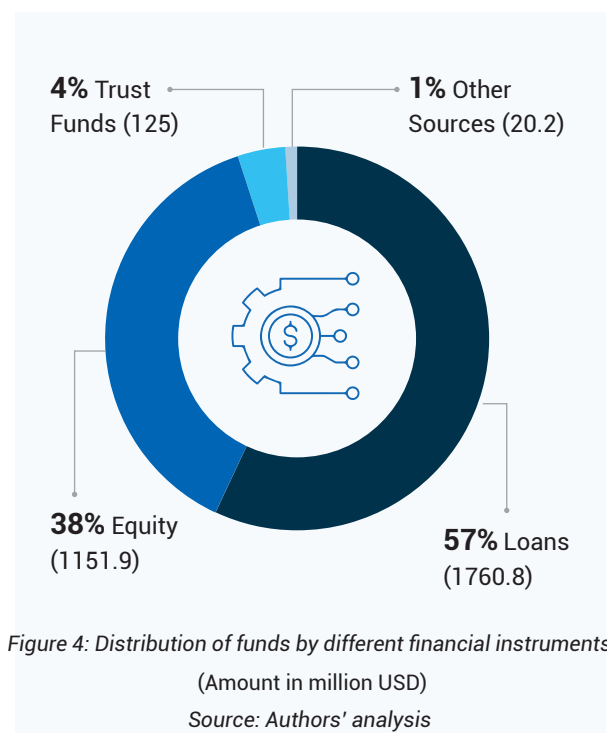
Projects	Objective	Funding (USD million)	Timelines	Project Leading Agencies
India E-mobility Financing Program Leading Agency ¹	Support faster adoption of EVs and development of EV ecosystem	1,497	2023-2032	Green Climate Fund (GCF)
Green Growth Equity Fund (GGEF) ²	Provision of clean and affordable transportation to the masses	217 ⁴	2021-2030	Green Climate Fund (GCF)
Electrifying Mobility in Cities: Investing in the Transformation to Electric Mobility in India ³	Catalyze access to finance for a large-scale adoption of EV across vehicle segments	168	2021-2025	Global Environment Facility (GEF) (UNEP and ADB led)
Program for Transformative Mobility and Battery Storage: Environmental and Social Systems Assessment ⁴	Accelerate green transition in transport and energy sector	500 ⁵	To be implemented in 2024	World Bank (WB)
Global Facility to Decarbonize Transport (GFDT): Accelerating E-Mobility in India ⁵	Accelerate deployment and adoption of EVs	0.4	NA	World Bank (WB)
GreenCell Electric Bus Financing Project ⁶	Finance procurement of E-buses and development of allied infrastructure	79	2022-2025	Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB), and Clean Technology Fund (CTF)

Projects	Objective	Funding (USD million)	Timelines	Project Leading Agencies
India: Sustainable Transport Financing ⁷	Finance acquisition of new energy efficient vehicles	100 ⁶	Approved in 2023	AIIB
Napino Auto and Electronics Limited ⁸	Scaling up EV manufacturing facilities	40	Approved in 2023	International Finance Corporation (IFC)
Last-Mile Mobility (LMM) Company ⁹	Scaling up of last mile connectivity in passenger and cargo segments	73	Approved in 2023	IFC
Ather Energy Private Limited ¹⁰	Scaling up production and distribution network of electric 2W	25	To be approved	IFC
British International Investment (BII) and Mahindra & Mahindra Ltd ¹¹	Accelerate availability and adoption of electric four-wheelers in India and other markets served by M&M	244.6	Approved in 2022	British International Investment (BII)
SIDBI and Shell Foundation RSF ¹²	Improve access to finance and scale up the adoption of e2Ws and e3Ws across India	6	Approved in 2023	Small Industries Development Bank of India (SIDBI) and Shell Foundation
Climate-friendly Modernisation of Urban Public Transport in Tamil Nadu ¹³	Support public transport expansion	107 ⁷		German Development Bank (KfW)

Additionally, U.S. Agency for International Development (USAID) will also support Government of India (GoI) to deploy 10,000 electric buses in India for which a proposal considering allocation of USD 150 million for setting up payment guarantee fund is currently under consultation.^{14,15}

2.1 Distribution of Financing Instruments

Figure 4 shows the distribution of just over USD 3 billion through different financial instruments that are available for accelerating EV growth in India. Loans up to the value of about USD 1.8 billion and equity amount of about USD 1.2 billion forms 95% of the total committed investment. Trust funds comprising of 4% of the total investment pool are part of the World Bank financing to India under the project 'Program for Transformative Mobility and Battery Storage.' The 1% of financing coming from 'Other Sources' includes USD 12.3 million as grants, in-kind investments of USD 1.9 million, and USD 6 million from Risk Sharing Facility (RSF) of the Small Industries and Development Bank of India (SIDBI) and Shell Foundation. We further review the contribution of different institutions by type of financial instruments used to mobilize funding for ZEV projects in India.



2.1.1 Debt Financing

The loan amount of USD 1092 million is being raised by co-financing under the GCF funded 'India E-mobility Financing Program' through Banks and Non-Banking Financial Companies (NBFCs^{viii}). World Bank, another key lender will be financing loans up to the amount of USD 375 million. In addition to that KfW, ADB, AIIB, and CTF are other major lenders for EV projects in India (Figure 5).

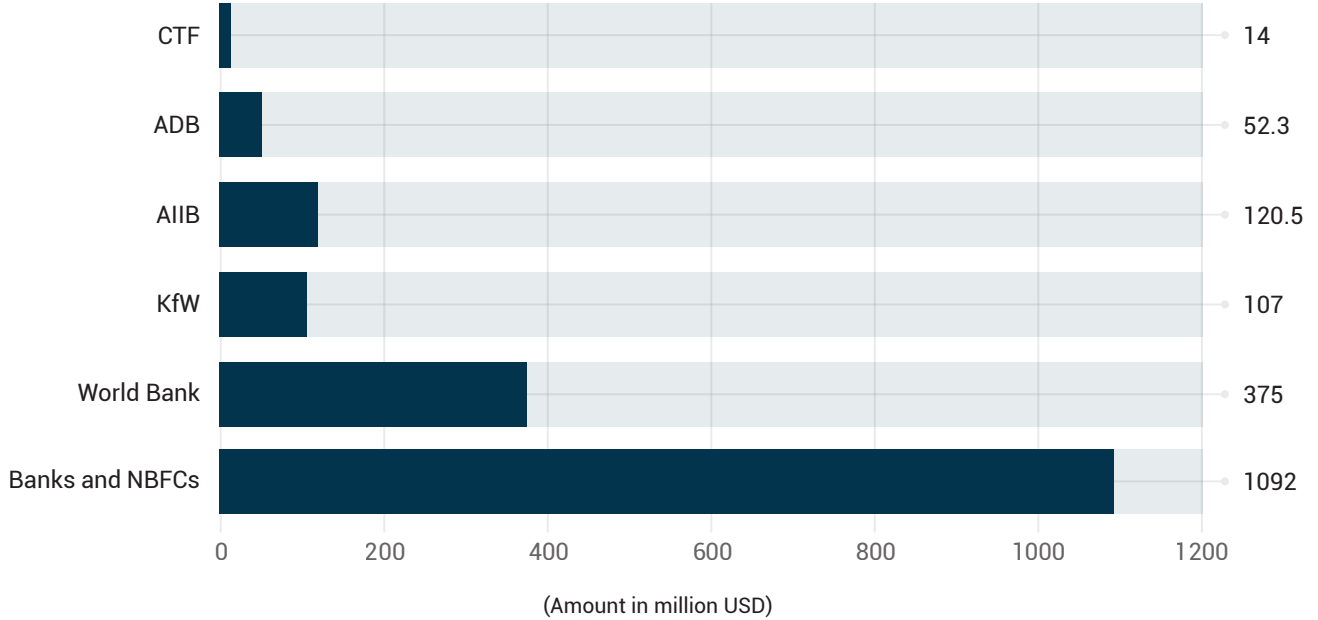


Figure 5: Institutions providing financing through loans

2.1.2 Equity Based Financing

British International Investment (BII) which is the development finance institution of the UK, the Green Climate Fund (GCF), and the International Finance Corporation (IFC) are largely funding projects through equity-based financing along with other commercial investors (Figure 6).

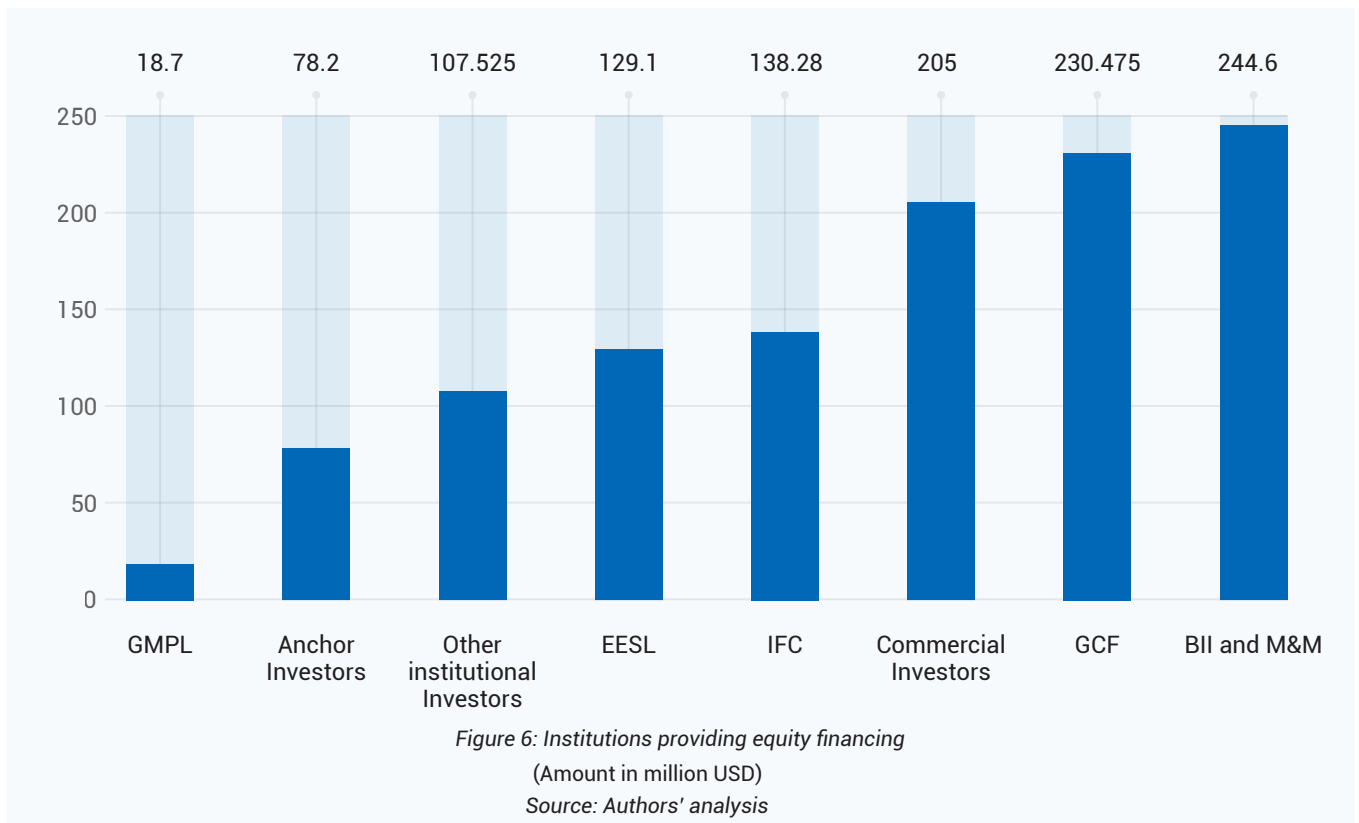


Figure 6: Institutions providing equity financing

(Amount in million USD)

Source: Authors' analysis

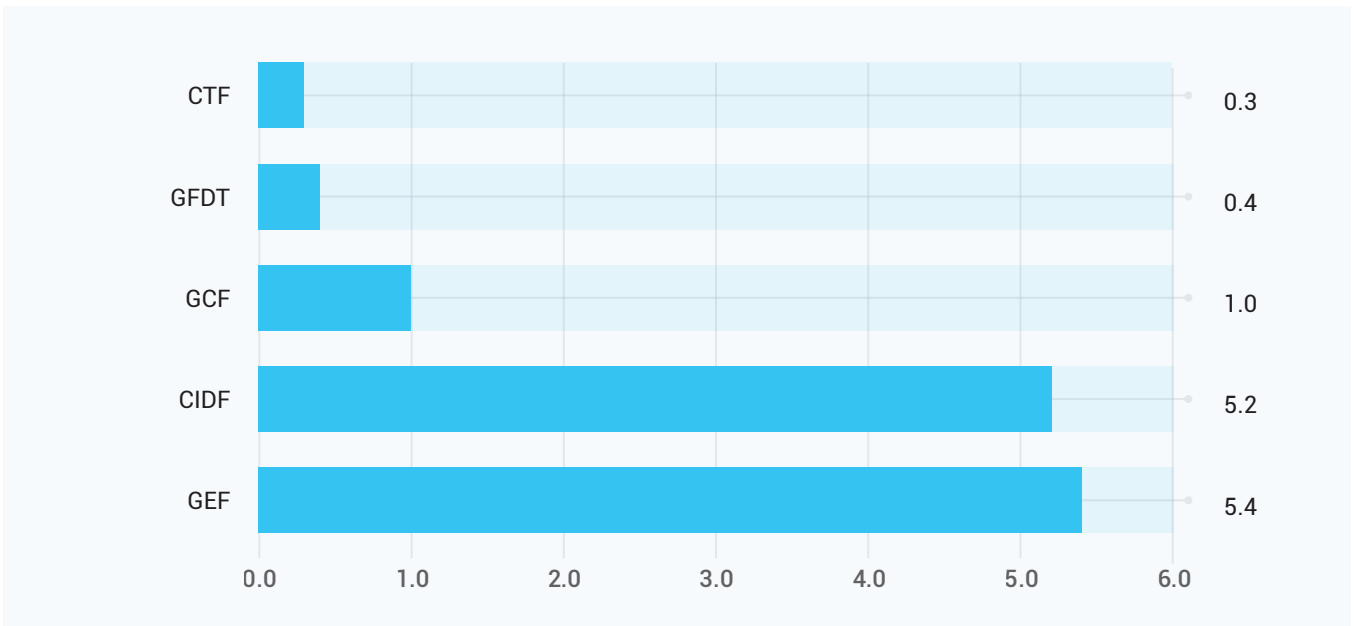


Figure 7: Institutions providing financing through grants

(Amount in million USD)

Source: Authors' analysis

2.1.3 Grant Based Financing

GEF and Climate Innovation and Development Fund (CIDF) are the leading grant providers supporting the 'Electrifying Mobility in Cities' project and 'GreenCell Electric Bus Financing Project', respectively, with a funding allocation of USD 5 million each (Figure 7). In-kind investment support of USD 1.9 million is being provided by Energy Efficiency Services Limited (EESL), Ministry of Housing and Urban Affairs (MoHUA), and Attero REcycling Private Ltd. for the GEF led 'Electrifying Mobility in Cities' project. Figure 7 and Figure 8 show the distribution of funds coming from different institutions in the form of grants and in-kind investments.

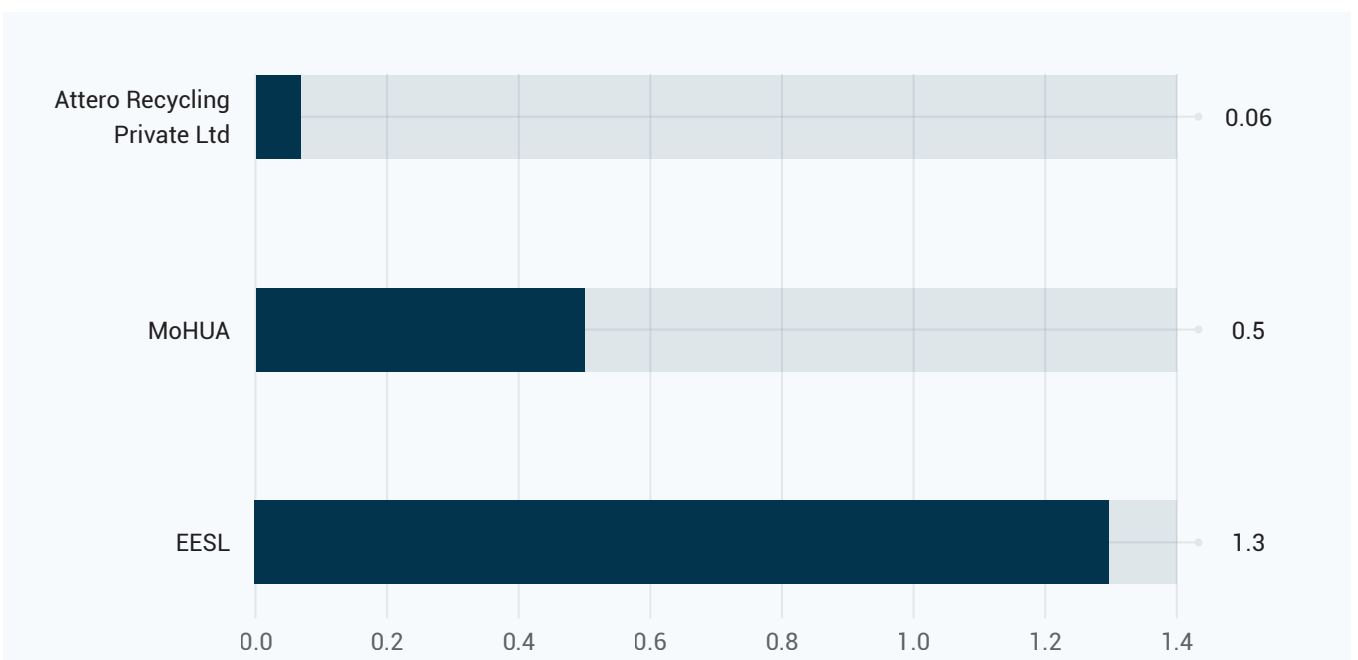


Figure 8: Institutions providing in-kind financing

(Amount in million USD)

Source: Authors' analysis

2.2 Expected Outcomes

Different projects supporting ZEV transition in India have varying objectives and goals for vehicle electrification and development of associated infrastructure. *Figure 9* maps the expected impacts of key projects in terms of vehicles electrified, e-miles powered, and CO₂ emissions mitigated.

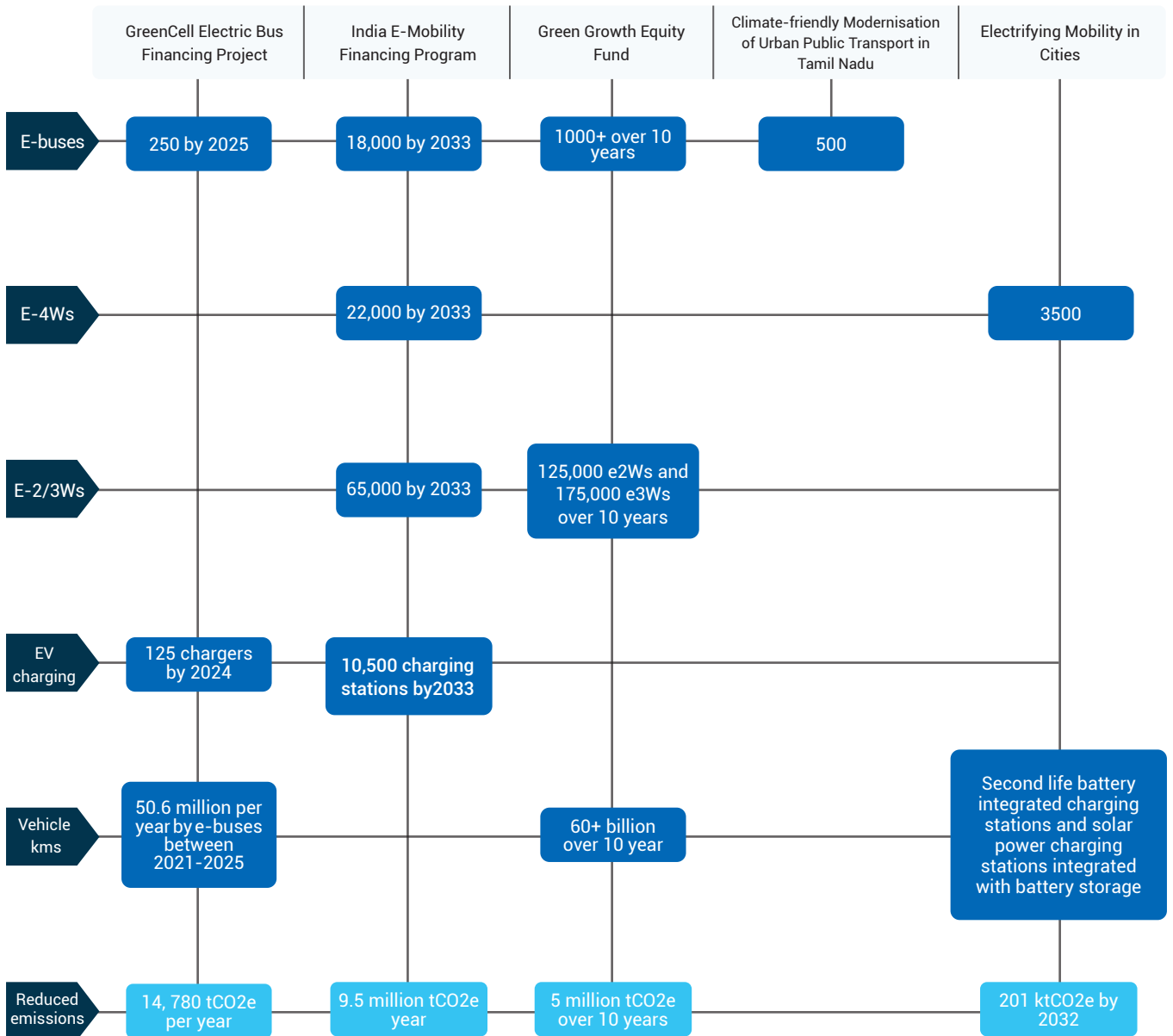


Figure 9: Expected outcomes from ZEV financing projects in India

Source: Authors' analysis

Key Vehicle Electrification Projects Supported by International Finance

This section provides an overview of select international programs and initiatives with regards to vehicle electrification currently supported through multilateral financing in India. All project information is updated as of December 2023.

3.1 India E-mobility financing program

Lead Agency: Green Climate Fund (GCF)

At present, the GCF is providing financing for electrification of transport in India through two projects, one of them being the 'India E-mobility Financing Program' with the other GCF project being outlined in the next section. By leveraging funds from the GCF and commercial investors, the program aims to support faster adoption of electric vehicles and growth of associated infrastructure in India. Further, by replacing and limiting the purchase of new Internal Combustion Engine (ICE) vehicles, the program will accelerate the decarbonization of transport in India.



Objective: To provide tailored financing solutions to EV owners and operators including in ancillary areas, such as charging infrastructure and batteries, that will rapidly bring the long-term total cost of EV ownership to a level comparable to ICE vehicles in alignment with national policies.



Timeline and funding support: Approved on May 19, 2022, the program will be implemented over a period of 10 years from the Funded Activity Agreement effective date of 31 July 2023. The program aims to mobilize approximately USD 1.5 billion in funding in the form of loans and equity.

The total support of USD 1,497 million includes USD 200 million from GCF and USD 205 million from commercial investors as equity support. The remaining 73% of financing, valued at around USD 1,092 million is expected to come in the form of loans from domestic or international banks and Non-Banking Financial Companies (*Figure 10*). Further, the program is expected to mobilize up to USD 2.1 billion over the implementation period by providing financing solutions to e-mobility companies and customers in the form of leasing and other structured credit solutions.

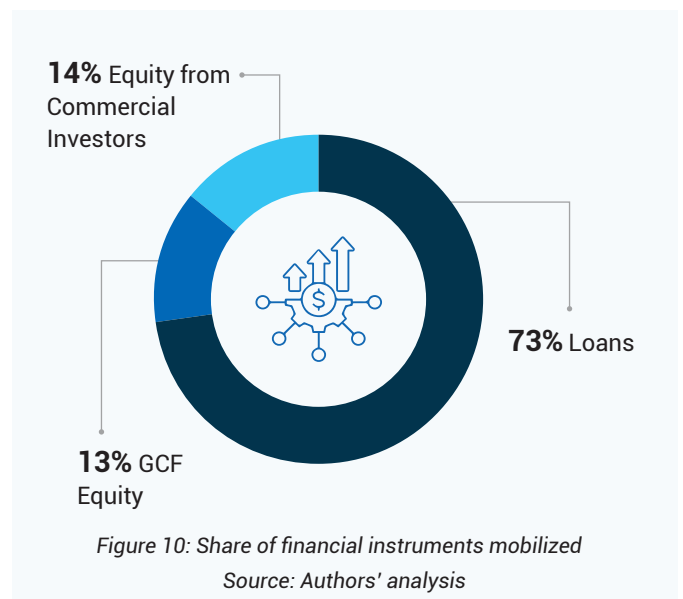


Table 2: Key program impacts and targets

Impact	Indicator	Targets		
		Baseline	Mid-term ⁹	Final ¹⁰
1. Electric vehicles financed	Number of e-buses financed by the Platform	0	8,000	18,000
	Number of four-wheelers financed by the Platform	0	7,000	22,000
	Number of two/three-wheelers financed by the Platform	0	15,000	65,000
2. Charging stations financed	Number of charging stations established through investment by the Platform	0	3,000	10,500
3. Low emission transport	GHG emissions reduced, avoided, or removed / sequestered	0	~0.3 million tCO _{2eq}	~2.3 million tCO _{2eq}
	Based on lifetime of new EVs financed, this program is supposed to lead to ~9.5 million tCO _{2eq} of lifetime GHG emission reductions.			
4. Direct job creation	Direct jobs created by the Platform	0	75	100

Current program status:

The program is currently under implementation and USD 50 million, i.e. 25% of allocated funds from GCF was disbursed on October 6, 2023.

3.2 Green Growth Equity Fund (GGEF)

Lead Agency: GCF

GGEF is India's first climate focused fund that is designed to invest in rapidly scalable, green, and sustainable businesses in India.

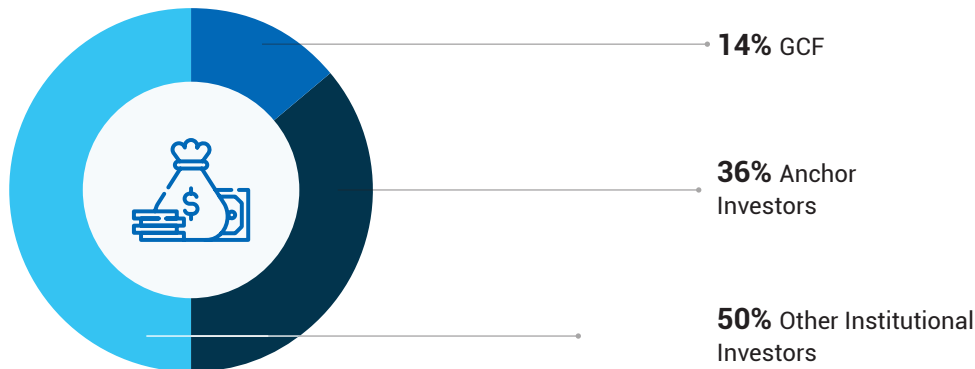


Figure 11: Share of financial instruments mobilised
Source: Authors' analysis



Objective: This program aims to address financial, technical, policy, and knowledge gaps impeding the uptake of innovative technologies and business models required for transition to low emission and climate resilient sustainable development pathways in India, across four focus areas – renewable energy generation, energy efficient technologies, low carbon transport and resource conservation, including water and waste management.



Timeline and funding support: The program was implemented on November 19, 2021, with the total funding amount of USD 944.5 million. The amount includes GCF financing of USD 137 million through equity and grants and co-financing equity of USD 807.5 million from anchor and other institutional investors. The total investment accounts for financing mitigation interventions across the four focus areas. However, 23% of portfolio is allocated to support transition to low-emission transport (e-mobility). Hence, it is expected that of the total project value, approximately USD 217 million will go towards supporting investment in clean and affordable transportation in India. Almost the entire funding allocation to transportation (~USD 216 million) comes in the form of equity and a small component (0.5%) is provided through a GCF grant (~USD 1 million). GCF will contribute to 14% of the total equity investment, with the rest to be co-financed by anchor investors (36%) and other institutional investors (50%), respectively (Figure 11). The project is expected to be completed by 19 March 2030.

Mitigation impact potential:

The project aims to deploy more than 1000 e-buses, 175,000 e-three wheelers, and 125,000 e-two wheelers that will contribute to more than 60 billion e-kilometres travelled over 10 years. This transition will avoid utilization of more than 500 million tons of diesel and more than 1500 million tons of CNG leading to mitigation of 5+ million tons of CO₂ emissions (Table 3).

Table 3: Key program impacts and targets

Impact	Targets		
	Baseline	Mid-term ¹¹	Final ¹²
1. E-miles powered	0	15 million kms	~40 million kms
2. Reduced emissions through increased access to low-emission transportation	0	~2.5 million tCO _{2eq}	~5 million tCO _{2eq}

Source: Authors' analysis impacts and targets

3.3 Electrifying Mobility in Cities: Investing in the Transformation to Electric Mobility in India

Lead Agency: **Global Environment Facility (UNEP and ADB as implementing partners)**



Objective: To enable the Government of India and relevant stakeholders to make the transformative shift to decarbonize transport systems, catalyse access to finance for a large-scale adoption of EVs across vehicle segments and reduce air pollution in cities by promoting scale-up of electric mobility in India.



Timeline and funding support: Approved in 2021, the project will invest USD 168 million through GEF grants (3%) and co-financing (97%) to scale up EV uptake in India. The co-financing amount includes a loan of USD 31.8 million from ADB and equity investment of USD 129.1 million from Energy Efficiency Services Ltd (EESL) which constitutes 19% and 77% of the total investment, respectively (Figure 12). The loan from ADB for this project is part of the USD 250 million loan provided to EESL in 2019 as part of the 'Scaling Up Demand-side Energy Efficiency Sector Project.' Rest of the co-financing is mobilized through 'In-kind' contributions (1%) from EESL, Ministry of Housing and Urban Affairs (MoHUA), and Attero REcycling Private Ltd.

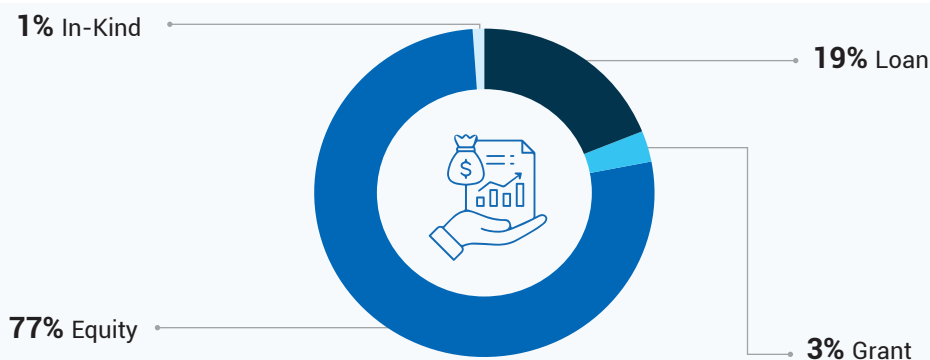


Figure 12: Share of financial instruments mobilized
Source: Authors' analysis

Table 4: Key program impacts and targets

Project Component	Expected Outcomes	Key Outputs
1. Integrated EV policy and framework for the e-mobility transformation	Government institutionalizes integrated e-Mobility national policy framework and facilitates effective implementation of increased e-vehicle infrastructure, including its measurement and monitoring in Cities (UNEP led)	Development and institutionalization of Comprehensive e-Mobility Plan (CEMP) for 2 cities inclusive of Elderly, Women, Children and Differently abled (EWCD) features.
2. Environment and Resource Use Management Framework for Batteries	Policy for Lithium-Ion Battery (LIB) reuse and recycling and battery standards for EVs endorsed by the Government (UNEP led)	Development of standards for battery swapping in two-wheeler and three-wheeler segments.
3. Enabling scale up of e-vehicle markets through pilot demonstrations	Enabling conditions for e-mobility investments created, new business models and charging infrastructure plans developed at city level (ADB led)	<p>Demonstration of pilot sub projects in different cities:</p> <ul style="list-style-type: none"> • Pilot planned for deployment of 500 e-2W in the e-commerce delivery segment in Mumbai, Ahmedabad, and Delhi. • Pilot planned to deploy 500 retrofitted e-3W in passenger segment in Chennai and Bengaluru. • EESL plans to launch 3500 e-4W across India. <p><i>Through pilot demonstrations the project aims to mitigate 201 KtCO₂eq emissions by 2032.</i></p>
4. Gender sensitive capacity development and raising awareness for growing e-mobility	Demand for e-vehicles stimulated through increased capacity and awareness among government, consumers and private sector stakeholders on the benefits and business opportunities for accelerating electric mobility uptake (UNEP led)	A total of 200 women will be trained in relevant skills such as commercial drivers, service technicians, and in operations and maintenance work of EV fleets in select two cities.

Current program status:

Based on consultations with UNEP and ADB we identified that pilot project demonstrations for e-two wheelers and three-wheelers (Component 3 of the project) have not yet been implemented. In place of pilot projects, the financing amount is now being utilized towards supporting two EV charging pilot programs:

1 Second Life Battery integrated Charging Stations

2 Solar Powered Charging Station integrated with Battery Storage

For the solar powered charging ports, the cities of Pune, Chennai, Varanasi, Shimla, and Guwahati have been identified as potential cities to conduct the pilot. More cities under consideration for this pilot are Chandigarh, Panaji, Bengaluru, Jaipur. Additionally, another pilot on deployment of e-bikes is under consideration in rural India through GEF financing.

3.4 Program for Transformative Mobility and Battery Storage: Environmental and Social Systems Assessment

Lead Agency: **World Bank**



Objective: By adopting a Multiphase Programmatic Approach (MPA) the project aims to enhance air quality and reduce GHG emissions and fossil fuel energy dependence by accelerating its green transition in transport and energy. The MPA aims to catalyze early investment and mobilize financing to create a sustainable market for battery energy storage systems and e-mobility ecosystem.

Project components and associated funding:

World Bank will provide **USD 1 billion** as programmatic support to public and private investments in battery storage and transformative mobility through the International Bank for Reconstruction and Development (IBRD) and concessional financing. This USD 1 billion has been split into two inter-linked operations:

- 1** USD 750 million will contribute to India's transition towards renewable energy and electric vehicles using a multiphase approach with an allocation of USD 250 million for each phase, where:
 - Phase 1 would adopt a Program for Results (PforR) instrument to scale up investments for battery energy storage system (BESS) in India and strengthen the capacity of key stakeholders.
 - Phase 2 would support **green charging infrastructure**, increasing RE supply to EV charging, and piloting two-way communications between power grids and EVs (V2G) in selected states and cities with high penetration of green electricity to help meet system peak demand.
 - Phase 3 would support accelerated adoption of **electric buses** in the country.

- 2** The remaining USD 250 million are explicitly allocated for accelerating the transition from ICE 2/3Ws to e-2/3Ws.

World Bank has also allocated USD 1 million to support the Government of India by providing technical assistance to evaluate demand, business models, policy, and regulatory requirements in the battery storage ecosystem for power systems and e-mobility.

It is likely that the USD 500 million which includes USD 250 million under Phase 3 for supporting adoption of e-buses and USD 250 million for accelerating transition from ICE 2/3Ws to e-2/3Ws will come through a loan of USD 375 million and a trust fund of USD 125 million.

3.5 Global Facility to Decarbonize Transport (GFDT): Accelerating E-Mobility in India

Lead Agency: **World Bank**



Objective and proposed activities: GFDT, a multi-donor trust fund launched by the World Bank has provided a grant of USD 400,000 to accelerate EV adoption in India through unlocking commercial financing at scale and supporting the promotion of alternative business models and new technological solutions such as battery swapping. The project has outlined three main activities through which it will support transition towards clean mobility in India:

- A** Accelerating e-bus deployment across India through innovative financing instruments.
- B** Supporting Indian states and cities in efficient planning and operation of e-buses.
- C** Supporting states to accelerate the adoption of electric 2Ws and 3Ws.

3.6 GreenCell Electric Bus Financing Project

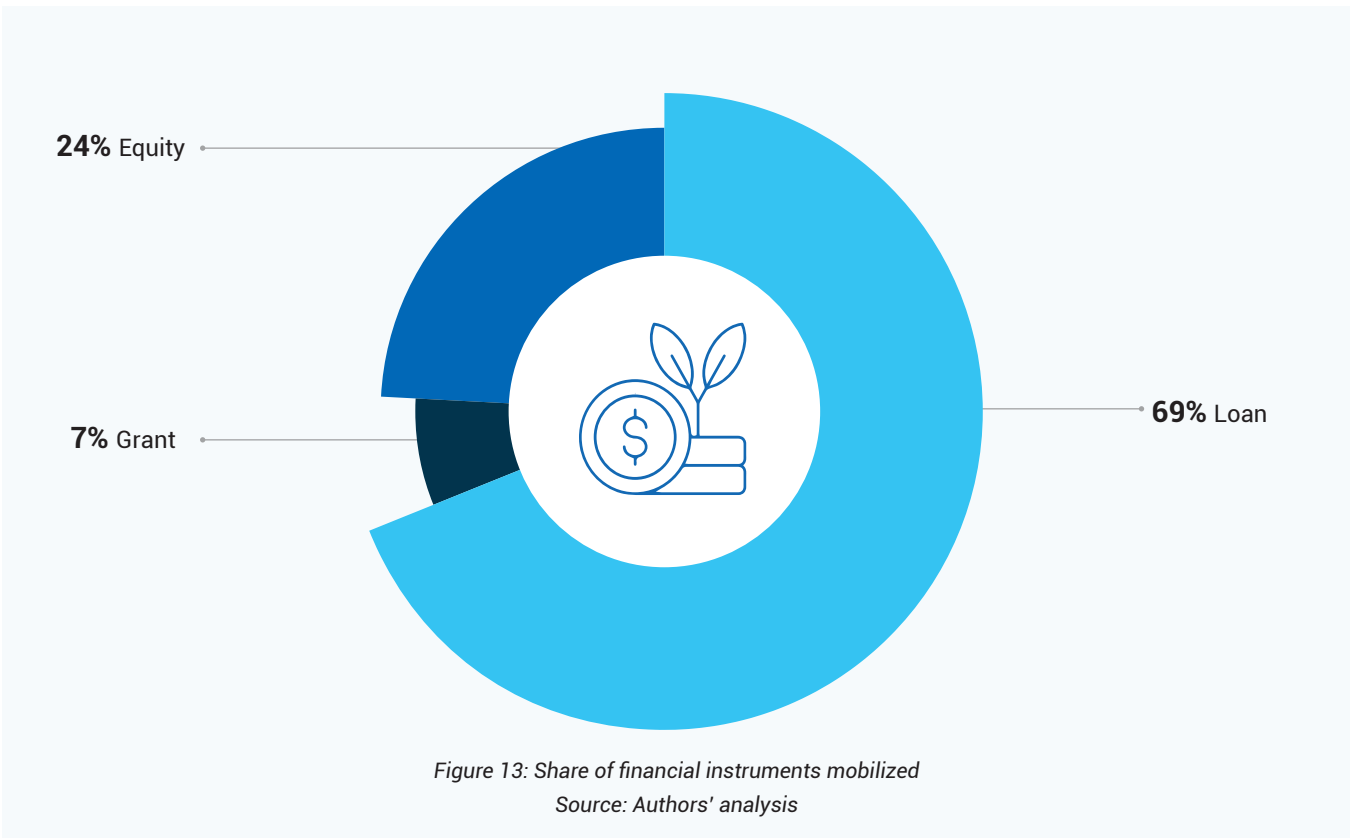
Lead Agency: **AIIB and ADB**



Objective: GreenCell Express Private Limited (GEPL), a wholly owned subsidiary of GreenCell Mobility Private Ltd. (GMPL) is implementing a three-phase project for procuring and operating 750 e-buses and allied infrastructure in India. GEPL has secured support from ADB to finance phase two of the project that involves financing procurement of 255 electric buses and the development of allied infrastructure including charging. The project aims to expand the operation of green and safer-for-women transport in India.



Timeline and funding support: With a total investment of USD 79 million the project is expected to be implemented between 2022 and 2025. Over two-thirds (69%) of the financing for the project comes through loans from ADB and AIIB (USD 20.5 million each) and a loan of USD 14 million from the Clean Technology Fund (**Figure 13**). Grant of USD 5.2 million is provided by the Climate Innovation and Development Fund (CIDF) and a grant of USD 0.33 million is provided by CTF. GMPL is also financing this phase with an equity investment of USD 18.7 million (24% of total funding).



Project Outcomes	Indicators
1. Operation of green and safer for-women transport system in India expanded	<ul style="list-style-type: none"> • Deployment and operation of 250 e-buses by 2025, of which 50 e-buses are powered through renewable sources. • GEPL decarbonizes another 50 buses by 2026. • At least 50.6 million vehicle kilometers per year provided by e-buses funded by ADB on average from 2021 baseline. • At least 14,780 tons of CO2 eq emissions avoided from 2021 baseline.
2. E-buses developed and operational in a gender-sensitive manner	<ul style="list-style-type: none"> • Installation of charging infrastructure at bus depots comprising 125 chargers by 2024. • Completion of three bus depots with women-friendly safety features by 2024. • Installation of a battery energy storage system facility with power capacity of 9 megawatt-hours by 2024. • Installation of women-friendly safety features in 100% of 250 buses by 2024.

Table 5: Key program impacts and targets

3.7 India: Sustainable Transport Financing

Lead Agency: **AIIB**



Objective: To increase the penetration of low-carbon transport in India, AIIB approved USD 100 million loan to Shriram Finance Limited (SFL). SFL, which is a non-banking finance company that primarily provides commercial vehicle loans for trucks, passenger vehicles, tractors and farm equipment, and construction equipment in India will use the loan amount to support and expand its lending to new energy efficient vehicle purchases in India. Proceeds to SFL will be used only for on-lending to individuals and companies to acquire commercial vehicles, which comprise of:

- Electric vehicles and CNG/LPG (at least 75% of on-lending proceeds), and
- BS-VI certified vehicles used in infrastructure development activities (at most 25% of on-lending proceeds).



Private Sector Financing Projects

As discussed earlier, multilaterals are also supporting several private sector companies in India to increase manufacturing and deployment of EVs. The International Finance Corporation (IFC) has proposed equity investments to scale up production and distribution of e-2Ws and e-3Ws across three EV manufacturing companies in India. While all these projects are at a very initial stage of development, it is helpful to understand how these funds are being disbursed across different segments of vehicles.

4.1 Napino Auto and Electronics Limited

Lead Agency: IFC

Objective: Napino Auto and Electronics Limited (Napino or the Company) is a leading manufacturer of electrical and electronic components for the 2-wheeler automobile industry in India. It recently secured an equity investment of USD 40 million from IFC which will be used to:

- Partial financing of a capex plan, primarily for expanding existing capacity in plants (brownfield expansion),
- Finance setup of a greenfield plant in Hosur-Krishnagiri, Tamil Nadu in India,
- Finance the capex for setting up the motor manufacturing plant at Halol, Gujarat in India,
- Strengthen company's balance sheet by repaying debt taken to finance purchase of shares from a minority investor.

The project will raise additional USD 17 million through debt from other local banks and internal accruals. In terms of anticipated impact of the project, IFC expects the investment to contribute to the integration of advanced EV manufacturing capabilities, the scaling-up of the EV ecosystem in India, and the smooth transition of the auto industry from fossil fuel powered vehicles to EVs.

4.2 Mahindra Last-Mile Mobility (LMM) Company

Lead Agency: IFC

Objective: IFC has invested USD 73 million in a new last-mile mobility company, a wholly owned subsidiary of Mahindra and Mahindra Limited. The investment will support capex, working capital requirements, etc. for the EV business of LMM. It is expected that the investment will increase access to e-3Ws in both passenger and cargo segments across India. This will support income and livelihoods of micro-entrepreneurs and will also lead to reduced local air pollution.

4.3 Ather Energy Private Limited

Lead Agency: IFC

Objective: IFC has proposed an equity investment of USD 25 million in Ather Energy Private Limited, one of the leading manufacturers of e-2Ws in India. By scaling up the company's production and distribution network, the project is expected to increase access to high quality and affordable electric two-wheelers in India, particularly in Tier II and Tier III cities.

Bilateral and other Independent Sponsor Funded Projects

In addition to multilateral support, several foreign development finance institutions are also investing to accelerate EV adoption in India.

5.1 British International Investment (BII) and Mahindra & Mahindra Ltd (M&M)

UK's development finance institution and impact investor will invest USD 244.6 million into a new wholly owned subsidiary of M&M Ltd. The investment will accelerate availability and adoption of electric four-wheelers in India and other markets served by M&M Ltd. The investment will support the country's emission reduction targets and create more than 8,000 jobs.

5.2 SIDBI and Shell Foundation Risk Sharing Facility (RSF)

A USD 6 million Risk Sharing Facility has been launched by SIDBI and Shell Foundation. The initiative includes USD 3 million from SIDBI and USD 3 million from Shell Foundation that will improve access to finance and scale up the adoption of e-2Ws and e-3Ws across India. The RSF will complement India's EV30@30 mission and foster the uptake of 50,000 EVs by providing partial credit guarantee to EV ecosystem players operating in the commercial segment.

5.3 Climate-friendly Modernisation of Urban Public Transport in Tamil Nadu

As part of the Indo-German cooperation, KfW has signed a financing agreement with the Government of Tamil Nadu for a reduced-interest loan of EUR 200 million to modernize and expand public transport in major cities of Tamil Nadu. As part of the assistance, the Government of Tamil Nadu will procure 500 electric buses with an amount of EUR 100 million (~USD 107 million) and around 2200 BS-VI standard diesel buses. The project will also support cashless payment systems and comprehensive digitalization to make the public transit system more user friendly and improve sustainability.

5.4 USAID e-buses financing in India

India and United States have launched a mechanism that will facilitate deployment of 10,000 electric buses in India. Through this partnership the U.S. government through the U.S. Agency for International Development (USAID) and the office of the U.S. Special Presidential Envoy for Climate along with India's Ministry of Heavy Industries and Convergence Energy Services Limited (CESL) will partner with private philanthropies such as the Global Energy Alliance for People and Planet and the Sequoia Foundation to accelerate electric bus financing in India. As per the proposal which is currently under the final stages of inter-ministerial consultations, the US will set up a USD 150 million fund as a payment guarantee mechanism for companies supplying electric buses to financially constrained state transport undertakings (STUs) in India.¹⁵

Enhancing State EV Policy Action for an outcome-based financing mechanism

This report details a diverse range of financial instruments currently mobilizing resources for India's EV transition. These include concessional financing targeting climate-related objectives and fostering sustainable development. Such financing often comes with favorable terms, like lower interest rates or extended repayment periods, making them particularly attractive for long-term, high-impact projects. De-risking instruments such as guarantee funds play a crucial role in reducing the perceived risks associated with EV investments, thereby encouraging more private sector participation. Equity investments, including funding through Public-Private Partnerships (PPPs) and large-scale funding to Original Equipment Manufacturers (OEMs), are instrumental in boosting manufacturing capabilities and infrastructure development. The financing landscape also features a blend of risk-sharing schemes, grants, equity, and loans, involving multilateral banks, international foundations, and private investors, all of whom are key players in facilitating the EV transition. However, despite these concerted efforts, the sector faces persistent financing challenges for both public and private stakeholders requiring active intervention from states.

The role of state governments in unlocking finance for e-mobility cannot be overstated. Policy and regulatory mandates for e-mobility, particularly in power, urban development, and urban transport sectors, fall largely under state jurisdictions, highlighting the significant role states play in the EV transition. Depending on their individual contexts, capacities, and fiscal constraints there is significant variance in the scope and design of the respective state EV policies. While few states have set targets or ambitions, there is no provision for enforcing these targets by legislation or law, and hence, have led to a slower than expected impact on ZEV market adoption. Based on an analysis of state EV Policies Indian states have collectively committed close to (USD 845 million) towards demand incentives and charging infrastructure support. However, there is a need to ensure effective disbursement and on-ground and the need for regulation-linked incentives. Setting long-term targets and providing a clear roadmap are essential steps in attracting investors and guiding industry actions.

EV financing encounters specific hurdles due to the high initial costs and complex deployment models. In case of e-buses, their capital-intensive nature for procurement, coupled with the necessity for supporting infrastructure like charging stations, presents a significant financial burden. Additionally, the unpredictability of public transport revenues can complicate payment security mechanisms, affecting the ability to service loans and attract private investment. States can play a pivotal role by facilitating innovative financing models such as Viability Gap Funding (VGF) or PPPs. Where VGF can subsidize the gap between project costs and revenue streams, PPPs blend public oversight with private sector efficiency.

However, in case of opting for leasing models, only private operators or OEMs with robust balance sheets can raise necessary commercial financing, creating a bottleneck that restricts broader participation in the e-bus ecosystem. Banks and financial institutions, wary of the nascent state of the electric ecosystem and variable public transport revenues, are hesitant to finance such ventures. Addressing these challenges requires a multifaceted approach, involving policy interventions and the development of more robust financial instruments. States need to promote equity investments among smaller operators and players to the playing field against larger enterprises. Although, states often struggle with aligning these initiatives with their financial resources and regulatory frameworks. Ensuring that smaller operators have access to financing requires states to establish more inclusive policies and collaborate with financial institutions to broaden lending criteria.

Similarly, financing for charge point operators deals with the challenge of large upfront investments and the prospect of long-term cost recovery. This scenario necessitates financial solutions that can accommodate extended payback periods and manage the risks associated with the emerging market dynamics. States can mitigate this challenge by incentivizing private investments in charging infrastructure and exploring creative funding solutions, such as green bonds or special EV infrastructure funds. Moreover, there is a growing demand for alternate business models like leasing, requiring financial solutions that are adaptable and supportive of such approaches in the EV sector. States can facilitate this through government-backed financial institutions or by providing guarantees to reduce the perceived risk for private financiers.

A stark contrast exists between the current level of financing and the actual need for achieving a comprehensive e-mobility transition. While the ongoing financing initiatives have mobilized around USD 3 billion, reports suggest that a staggering amount of approximately USD 266 billion (spanning across vehicles, EV supply equipment and batteries) is necessary for a full-scale transition. This gap highlights the urgency for enhanced and innovative financing solutions. States can address the financing gap by actively seeking out and promoting innovative financing mechanisms, such as outcome- or results-based financing models. These models, which link funding to specific, measurable outcomes like emission reductions or EV adoption rates, can attract new investors and drive efficient utilization of funds.

In addition, to attract financing from mainstream financial institutions, states need to integrate e-mobility objectives into their broader economic and development plans, thereby creating markets that are appealing to large-scale investments. Also, states need to create a policy environment that is conducive to investment while managing the inherent risks and uncertainties of a rapidly evolving sector like EVs. This can unlock financing from mainstream financial institutions, who are more likely to invest in well-structured, policy-backed projects, thus amplifying the impact of state-level actions.

Currently, several Multilateral Development Banks (MDBs) and financing institutions, international climate foundations, and private institutional investors are working with the national government and other domestic financial institutions to enable faster adoption of EVs. This includes the development of its associated infrastructure

Based on a series of stakeholder engagements, initial findings indicate the following gaps:

- 1** While most initiatives acknowledge the existence of state EV policies, they do not have a mechanism in place to actively engage with sub-national governments to enable a two-way process that can streamline the flow of funds and policy action towards a common goal.
- 2** Lack of coordination among the larger international development finance community to streamline their various initiatives, to avoid duplication of efforts and increase the efficiency of every dollar disbursed.
- 3** Lack of information and awareness among states about the availability of these financing mechanisms, and in cases where states are aware, they lack the technical capacity to effectively leverage the international finance community.
- 4** No overarching measuring, reporting and verification (MRV) mechanism to periodically assess and review the progress and impact of various international EV financing initiatives in India.



Way Forward

As India moves towards its clean transportation goals, work to align sub-national policies with India's national goals will rely on stronger collaboration and coordination, including to leverage financial resources. Crucial to these efforts will be the ability to effectively respond to States' unique needs and requirements on vehicle electrification, including support in the design and implementation of policies that can help de-risk the sector and enable deployment of capital at scale. The international financial community will have a role here and would play an even greater role – such as expanding lending portfolios and reducing the cost of capital to make the available offer more competitive – when the necessary enabling policies are in place.

In the recent years, India has seen considerable success with an integrated policy regime on renewable energy targets and deployment between the centre and the states, achieving a total installed RE capacity of 179 GW (as of July 2023), and the creation of the Association of Renewable Energy Agencies of States (AREAS) under the central Ministry of New and Renewable Energy (MNRE). There can be lessons from this for the EV transition as well, at the domestic level but also for other countries and regions around the world.

In discussions with various financial institutions and stakeholders, some of the key themes that emerged include:

- The role of reforming EV subsidy programs to align with clear EV sales targets and associated infrastructure roll-out;
- The implementation of provisions in state EV policies to better access financial resources;
- The importance of having a strong, enforceable regulatory framework to support an incentive and financial mechanism, increasing the impact on market transformation;
- The value in expanding the scope of State's EV policies to have clear goals and rewarding innovations, such as retrofitting to address transitions in rural markets.

Overall, we highlight key actions that can set the foundation for streamlining international financing support for a state-led EV transition in India.

For consideration of Indian policy makers at both the national and state level:

- With the aim of achieving ZEV market transformation, India should consider an overarching program-based approach, which includes clear target setting for both vehicle and infrastructure deployment and aligns incentive programs as well as industrial and transport policy actions to these outcomes. This will create a strong framework to align supply and demand ecosystems for the ZEV transition.
- With most state governments in India having their own State EV policies, it would be useful to identify elements of a common minimum policy approach, that will further regulatory and demand certainty, as well as allow for greater regional cooperation between states. For example, states that are pre-existing automotive clusters could partner with neighbouring states that are major consumer markets to create a common EV policy framework that can lead to co-benefits on both the demand and supply side. This will require a decoupling of demand side EV policies from industrial policy. Another example could include a coalition of eastern states in India such as Assam, Meghalaya, West Bengal, Bihar and Odisha to create a common EV policy zone with common ZEV regulations that can leverage economies of scale and create more local jobs and investment.
- Greater consideration of equity in the EV transition narrative such as enhanced purchase incentives for low-income households, incentives for used EVs, backward districts clean transportation transformation program that could include rural mobility, and so on.
- At the national level, India recently has designated (as on 23 November 2023) the Ministry of Heavy Industries as the nodal agency for the "coordination for manufacture, sale and adoption of electric vehicles." This will allow for better inter-ministerial coordination and decision-making.
- Consider setting up of a National MRV mechanism for ZEV Transitions in India, anchored by the Ministry of Heavy Industries and including other relevant line ministries such as Ministry of Road Transport and Highways, Ministry of Power, Ministry of Finance, Ministry of Mines, NITI Aayog as well as EV Nodal agencies of all state governments. This can aid coordination, review, and strategic planning for India's EV transition, and allow for a dynamic policy and regulatory environment, with a clear outcome-based approach.

This will create a strong sense of market certainty and allow for greater inflow of international climate finance, as well as create a multiplier effect for crowding in private capital from both international and domestic sources. With regards to the role of international financial institutions:

- Many of the afore-mentioned recommendations for Indian policymakers will require significant technical assistance and capacity building at both the national and state level. With greater clarity on India's ZEV targets and market transformation goals, international financial institutions can play a more strategic role in creating fund flows as policy certainty will allow for lower risks to capital.
- Given the common objectives of MDBs and other international financial institutions in terms of facilitating the ZEV transition in India, a common platform for all organizations to engage with each other as well as with both the national and state governments (through the proposed National MRV Mechanism) will allow for designing a set of more strategic activities and regular impact assessment of international and domestic funds being spent.
- Key activities for consideration could include technical assistance to national and state governments for ZEV target setting and policy design, complement financial assistance to domestic resources to meet these targets, assess the potential of a results-based or policy-based financing program that allows for greater quantum and lower cost of capital with more ambitious policy action for ZEV market transformation (*Figure 14*).

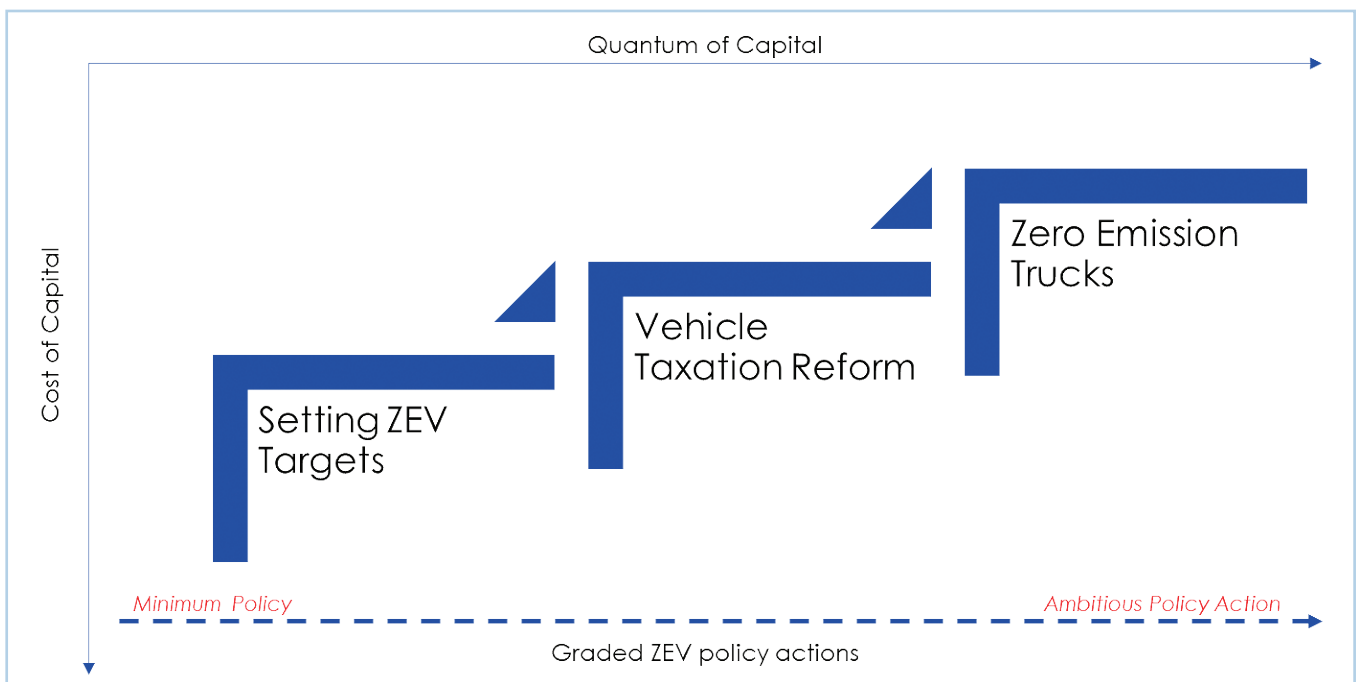


Figure 14: Policy-based or Results-based Financing Framework for ZEV Transitions

Source: Authors' analysis

We look forward to seeing how and where we can take these recommendations forward with the UK and wider partners, under the 'India Country Pilot Initiative', in the coming year as well as exploring opportunities for linking this work to broader regional and international activities, such as those being implemented by the ZEVTC's Global ZEV Transition Roadmap.

Recommendations for India's National and State Governments	Recommendations for International Financial Institutions
<p>1. Consider setting enforceable EV targets by vehicle type, including hard-to-abate segments.</p>	<p>Look to create a platform for greater engagement with states while designing financing initiatives – the ZEV Country Partnership with India could provide this.</p>
<p>2. Explore options for creating program-based EV transition roadmaps that are aligned to targets including infrastructure.</p>	<p>Consider coordinating with the global international financial ecosystem on activities and programs. This could be facilitated through the ZEVTC International Assistance Taskforce and the delivery framework of the Global ZEV Transition Roadmap.</p>
<p>3. Look to integrate equity within EV policy frameworks.</p>	<p>Leveraging the India ZEV Country Partnership Framework to support a dialogue on creating a Results-based or a Policy-Based Financing approach to EV transitions.</p>
<p>4. Coordinate with other States for regional cooperation and policy best practice sharing.</p>	<p>Explore opportunities to promote market innovation and technology development.</p>

National-level Monitoring, Review and Verification (MRV) Mechanism for Coordination, Review and Strategic Planning



References

- ¹ Investment loans can be used for any development activity that has the overall objective of promoting sustainable social and/or economic development, in line with the MDBs' mandates.
- ² Policy-based financing supports a program of policy and institutional actions for a particular theme or sector of national policy. While it does not use the cost estimation approach for each policy action, disbursements of PBF are conditional on the borrower fulfilling its policy commitments in the lending agreement.
- ³ Results-based financing directly links the disbursement of funds to measurable results in a government-owned program.
- ⁴ This amount is indicative of 23% of the total portfolio value (USD 944 million) that is allocated to the transport sector.
- ⁵ It is assumed that 75% of the financing for this project will come through WB loan and rest 25% from trust funds. This assumption is made based on the financing distribution of Phase I of this project. More information available at: <https://documents1.worldbank.org/curated/en/099093002132315311/pdf/P17222305f764006088fd0782461640aad.pdf>
- ⁶ At least 75% of the lending proceeds will go towards financing EVs and CNG/LPG vehicles. At most 25% will go towards BS VI certified vehicles used in infrastructure development activities.
- ⁷ Amount equivalent to Euro 100 million
- ⁸ Nonbank financial companies (NBFCs), also known as nonbank financial institutions (NBFIs) are entities that provide certain bank-like financial services but do not hold a banking license. Retrieved from <https://www.investopedia.com/terms/n/nbfc.asp>
- ⁹ Mid-term refers to 5 years from FAA effective date.
- ¹⁰ Final refers to 10 years from FAA effective date.
- ¹¹ Mid-term refers to 5 years from programme implementation date.
- ¹² Final refers to 10 years from programme implementation date.

Endnotes: Project information source documents

- ¹ <https://www.greenclimate.fund/document/india-e-mobility-financing-program>
- ² <https://www.greenclimate.fund/document/green-growth-equity-fund>
- ³ https://open.unep.org/docs/gef/CEO/10276_CEO%20Request.pdf
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