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NITI Aayog

DRIVING AFFORDABLE FINANCING FOR ELECTRIC VEHICLES IN INDIA

June 2022

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Executive Summary

Across the globe, electric mobility is gaining traction as consumers increasingly adopt Electric Vehicles (EVs). This accelerated growth in EV adoption is the culmination of a host of factors including governments' environmental commitments, commensurate policy support, and the improving economics of EVs. Further, with battery prices likely to reduce in the long run, upfront purchase price of EVs is also expected to come down, thereby giving a further fillip to EV adoption. However, some key challenges in the widescale adoption of EVs continue to persist.

India is one of the top 5 markets for automobiles and has already made a strong commitment towards driving EV adoption in the country. A host of policy measures, regulations, and interventions have already been made in that direction which broadly fall into regulatory norms (e.g., Corporate Average Fuel Efficiency or CAFÉ norms regulating CO_2 emissions by auto manufacturers), incentives for demand creation & charging infrastructure set up (purchase subsidy under FAME-2, lower GST) and promotion of local manufacturing (ACC PLI, Auto & Auto Components PLI). While these measures will help in bringing the overall total cost of ownership of EVs at par with ICE, the absence of a holistic EV financing ecosystem acts as a significant hurdle to the large-scale adoption of EVs in the country. With growing EV adoption, we estimate around INR 45-55 thousand crore will be required to finance EV purchases by 2026. In order to truly harness this potential, it is imperative to comprehensively address the financing challenges in the ecosystem and unlock the capital required to drive India's green transformation.

From a consumer's perspective, currently the financing options available in the market are limited along with unfavorable terms. They have limited access to funding with fewer bank and NBFC options lending for EVs vs ICE. For the options available, loan terms are starkly unfavorable. LTVs can be 10%-30% lower depending on vehicle category resulting in higher initial down payment. In addition to this, the EMI burden is higher due to 1-9% higher interest rates & 6-18 months shorter tenor offered vs ICE. Additionally, for higher usage applications, there is an added recurring capex of battery replacement every 4-5 years with low financing options. On the other hand, financiers are unable to offer competitive products due to real and perceived risks, given the nascency of the technology and the market.

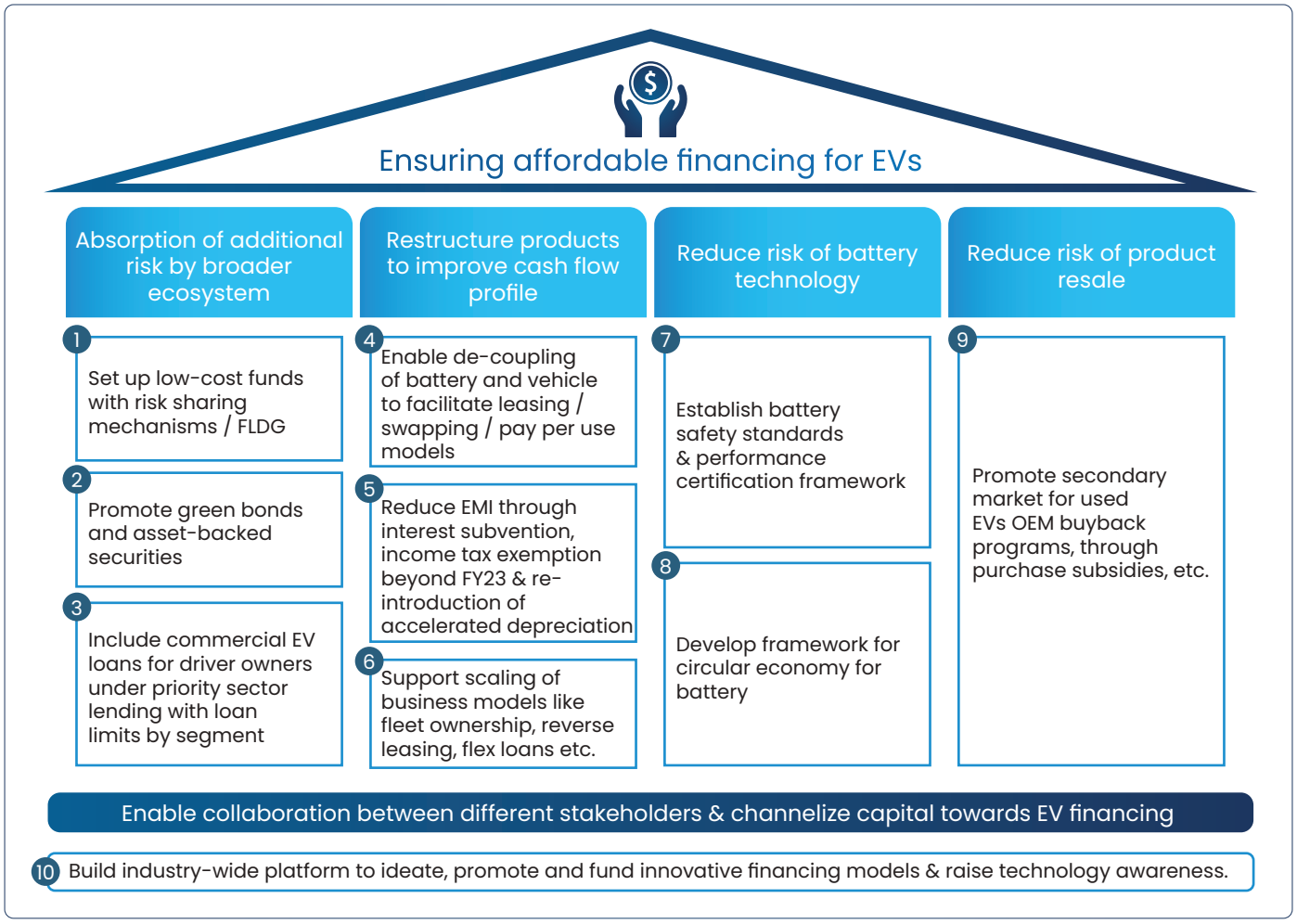
Overall, the challenges faced by the EV ecosystem are rooted in 6 major risks surrounding EVs:

1. Resale value of the battery is unestablished as second life use cases or a secondary recycling market are yet-to-be established and there is lack of traceability of battery health due to lack of certification standards.
2. Resale value of vehicle without the battery is unknown. Further a secondary market for used EVs has not been established yet.
3. Significant skepticism regarding product performance and technology given its nascency and lack of historic data to gauge durability of product for different applications.
4. Uncertainty in savings and earnings since higher EMI and higher down payment are needed against an income which is contingent on running & usage of EVs
5. Inherently different capex structure due to battery replacement required every 4-5 years (in 3W).
6. Ticket size barriers on loans and EMI precluding a large number of people from owning EVs personally.

To address the challenges detailed above, multiple entities in India and across the world like governments, OEMs, financiers, and startups have come up with a variety of solutions. These can be categorized into 5 broad levers:

1. Absorption of additional risk in EV financing by the broader ecosystem to bring down the cost of borrowing for end customer.
2. Restructuring of financial products to help mitigate challenges such as higher down payment or higher EMI through innovative models to improve cash flows for end customer.
3. Reducing the risk of battery technology by addressing the uncertainty around battery performance and developing a secondary market for used batteries.
4. Reducing the risk of product resale by developing a used vehicle market.
5. Creation of a platform to enable collaboration between different stakeholders and channelize capital for EV financing.

Based on a comprehensive understanding of the challenges faced in EV financing and an extensive review of solutions across these 5 pillars, a 10-point action agenda is proposed below (Actions 1-10) to address the different risks prevailing in India's EV ecosystem.



Thrust Area 1: Enable the broader ecosystem to absorb the additional risk in EV financing to bring down the cost of borrowing for end customers

Due to concerns around technology and long-term economics (including resale value), FIs perceive that financing an EV vehicle has additional risks over ICE. Thus, as a mechanism to limit their exposure, FIs pass this risk to end-consumers which ultimately results in higher cost of borrowing. Some mechanisms through which the broader ecosystem can absorb some of the inherent risk or provide FIs with access to low-cost capital are proposed below:

#1 – Establish low-cost funds with risk sharing mechanisms / first loss default guarantee

Access to low-cost capital can be facilitated through the creation of a risk-sharing facility like a loan loss reserve that can cover general default or loss due to specific risks, for e.g., product failure. This reserve can be created at the behest of the government and structured to include multiple stakeholders across the EV ecosystem through funding mechanisms like grants, risk underwriting, debt, equity, debt and equity with first loss guarantee, etc. The government, along with FIs and MDBs can explore some of these structures to mobilize significant amount of nascent institutional capital to accelerate financing for EVs in India.

#2 - Promote green bonds and asset-backed securities

Green bonds have emerged as an innovative financial instrument in the last decade to mobilize significant amount of nascent institutional capital, distribute risk over a larger base through asset backed securities and bring down the cost of capital. However, additional government and regulatory support is required for the proliferation of green bonds as a financing instrument in India. Creation of a coherent and comprehensive taxonomy and definitions along with establishment of proper standards is essential to build investor confidence and increase participation in this instrument. Additionally, support in the form of tax incentives for retail investors, inclusion of green mobility funds for CSR investments, and/or coverage of additional issuance costs (green certification) for issuers can also be provided. Separately, MDBs can also support green bonds through the identification/creation of funds with a green portfolio to cover concentration risk.

#3 - Include commercial EV loans under priority sector lending

A targeted priority sector lending policy to support specific EV segments and use cases could be beneficial for the sector. For example, the inclusion of EV loans under priority sector lending with internal lending limits for Driver cum Owner commercial applications/fleets can be considered. This will help in increasing financing options for the end customer and reduce the cost of borrowing with entry of banks in the segment.

Thrust Area 2: Restructure financial products to help mitigate challenges such as higher down payment or EMIs through innovative models that can potentially improve cash flows for end customers

Purchasing an EV currently has higher financing costs than traditional ICE vehicles. Depending on the vehicle segment, the down payment can increase by up to 20% while EMIs can reach up to 1.5-1.8x of those for comparable ICE vehicles (albeit for shorter tenor loans). Hence, innovative financial products that can mitigate some of the challenges faced by both financiers as well as customers are required to improve cash flows for customers.

#4 Facilitate de-coupling of battery and vehicle to enable leasing / swapping/ pay per use models

De-coupling the battery from the vehicle allows the financiers to factor risks for vehicle and battery separately and create standalone products for vehicle without battery and the battery itself. This reduces loan amount on the vehicle (hence reducing down payment & EMIs) & gives customers an opportunity to incur expenses for the battery as per usage – essentially making the cost profile similar to ICE vehicles wherein fuel costs are directly proportional to the usage of the vehicle. To enable this, support will be required from the government in terms of policies which will help sale of vehicles and batteries separately. This could be done through multiple initiatives like detailing vehicle registration procedures at the RTO and state transport departments, detailing subsidies for vehicles without batteries and designing incentives for battery manufacturers and BSS operators either under an existing framework (for e.g., FAME-2) or a new policy, which will also help in stimulating demand.

#5 Reduce EMI burden for customers through subvention schemes and tax exemptions

Subvention schemes can be designed to offset a portion of the customer's interest burden by enabling other players in the ecosystem to absorb a part of the interest burden. The

government can offer direct interest subvention schemes paired with conditions on extended warranty / buyback guarantees by OEMs. This can also be led by MDBs or other 3rd parties where the MDBs partner with banks / NBFCs to provide EV loans mandating certain subvention vs ICE loans. In addition to interest subvention, the government can also look at extending income tax benefits provided to individual owners under Section 80EEB for loans sanctioned beyond FY23. Accelerated depreciation for EVs can also be reintroduced for EV purchases by organizations using loans, to help offset interest cost burden for commercial applications.

#6 Provide support for the scaling of business models like fleet ownership, reverse leasing, flexible loan structures, etc.

Banks, MDBs, and other DFIs can help mobilize low-cost funding for any existing or upcoming financial entity, for e.g., startups, fintechs etc. providing innovative solutions (for e.g., fleet ownership, reverse leading, flexible loan structures, etc.) by setting an asset financing structure which is front ended by the financial entity itself. The financial entity will be responsible for operationalizing the asset finance company, disseminating funds, and absorbing the credit risk. Banking and financial institutions, on the other hand, can act only as investors thereby safeguarding their returns.

Thrust Area 3 – Reduce the risk of battery technology by addressing the uncertainty around battery performance and developing a secondary market for used batteries

Since batteries can comprise 30%-40% of the total vehicle cost, battery life and degradation are a major concern for financiers. Given the nascency of the technology, FIs have limited understanding on how battery health and consequently vehicle performance will change during the product lifecycle. These concerns can be assuaged through a targeted battery policy as proposed below.

#7 Establish battery safety standards and performance certification framework

A holistic battery technology roadmap/policy is needed to address the risks associated with battery technology through collaboration between EV OEMs, players along battery value chain, and 3rd party testing agencies. The objective is to create a certification mechanism that will boost financier confidence on battery performance and traceability. This framework needs to cover key areas including classification guidelines for EV batteries, battery labeling and information requirements along with unique ID for traceability and regulation for EV batteries to contain a smart BMS with guidelines around data capturing and sharing, to enable proper certification of batteries. The framework should also focus on rigorous enforcement of the AIS-156 and AIS-038 (Rev 2) safety standards. In addition to this, standards also need to be developed for performance and ageing testing for EV batteries.

#8 Develop framework for circular economy for battery

Development of a secondary economy is essential to establish a floor price or a salvage value for second life of batteries / end-of-life scrappage which will help financiers in assessment of value they can recover from the asset in case of default. To facilitate a circular economy for batteries, battery recycling and end-of-life regulations are required, laying down the roadmap across target recovery rates at material level, recycling efficiency, target rates for use of recycled content in new batteries, standards on 2nd life use cases, etc. A comprehensive long-term roadmap (8-10 years) is needed to guide the R&D efforts for recycling and second life usage which will attract interest of private players to invest and facilitate development of innovative solutions. Additionally this will also help in mobilizing the capital needed for commercialization of these solutions and creating a robust secondary ecosystem for batteries.

Thrust Area 4 – Reduce risk of product resale by developing a used vehicle market

Most EVs sold to date have not gone through the entire product lifecycle to enter the used vehicle market till now. Hence, the secondary market for EVs currently remains very nascent in India. Governments globally have helped kickstart this market through purchase subsidies while OEMs are also facilitating sales through models like leasing. A similar push in India can help initiate market development for used EVs.

#9 Promote the secondary market for used EVs through purchase subsidies, OEM buyback programs, etc.

Purchase incentives for used EVs in the form of one-time grants, tax breaks, etc., can be considered. Conditions for disbursing incentives can be placed to ensure a minimum performance of the vehicle, for e.g., minimum battery capacity and range, maximum kilometers driven before resale, etc. OEMs can also facilitate secondary market development through buy-back programs with back-to-back arrangements with financiers.

Thrust Area 5 - Create platforms to enable collaboration between different stakeholders and channelize capital for EV financing

While there are multiple startups providing affordable solutions for EVs, their reach is currently limited, and they require access to capital to scale up their solutions. On the other hand, financiers still consider EV as a risky sector due to the knowledge gap and limited understanding around technology. It is essential to bridge this information asymmetry through collaboration between OEMs, industry bodies and other players in the EV ecosystem.

#10 Build industry-wide platform to ideate, promote innovative financing models & raise awareness on technology

A unified platform can be created that brings multiple stakeholders like EV OEMs, battery manufacturers, legacy banks and NBFCs, fintechs, MDBs, DFIs, etc., along with representatives from relevant government ministries. The platform will help with following objectives:

- Ideate, design, and promote innovative financing models.
- Undertake projects in this space to incubate, roll out and scale these initiatives.
- Help channel private capital and identify regulatory challenges.
- Facilitate knowledge exchange between multiple stakeholders.

Given the complexity of challenges faced throughout the ecosystem, it is crucial to have a multi-pronged approach with integrated solutions to address barriers across policy, technology, vehicle economics, and customer behavior. This requires the government, financial institutions, OEMs and various industry players to collaborate and create holistic solutions to promote affordable financing for EVs. Effective execution of the actions proposed below can help accelerate the penetration of EV financing in India.

01
Introduction

Electric mobility has witnessed exponential growth globally, driven by environmental commitments and sustained policy support by various governments along with improving economics of EVs. Additionally, with battery prices likely to rationalize over the long term, we expect the scales to further tip in favor of EVs. Inarguably, India is one of the top 5 markets for automobile sales globally and its strong commitment to driving EV adoption in the country augurs well for the growth of the EV industry.

However, some key challenges in the widescale adoption of EVs continue to persist. These include consumer anxieties regarding the vehicle, the relatively higher cost of establishing a charging infrastructure, unencumbered access to technology, and the cost of the technology itself. The Government of India (GoI) has been proactively working on resolving some of these issues through various regulations and interventions in an effort to drive demand creation and promotion of local manufacturing in this sector.

Some of the key regulatory interventions include:

- CAFÉ or Corporate Average Fuel Efficiency / Economy[1] regulations, which came into force in India in April 2017. Under this regulation, the average corporate CO_2 emissions basis sales-volume weighted average for every auto manufacturer must be less than 130 g/km by 2022 and below 113 g/km, thereafter. The aim of the regulation is to drive auto manufacturers to move to electric or hybrid car manufacturing in the long run.

Demand creation & charging infrastructure set up:

- The GoI has already set the stage for the adoption of EVs in India through multiple schemes that are aimed at stimulating demand including purchase incentives, road tax waivers, scrapping, and retrofit incentives.
  The Faster Adoption and Manufacturing of Electric Vehicles or FAME-2 scheme[2], started in April 2019, has an outlay of INR10,000 crore and aims to support 1.56 million EVs. The policy is focused on providing demand incentives in the form of purchase subsidy given basis battery size of vehicle. The FAME-2 policy also lays out capital subsidy of up to 100% of equipment cost for setting up EV charging stations.
- In addition to this, GST on EVs has also been reduced to 5% starting from April 2019 while GST for ICE vehicles remain 18% or more depending on the vehicle. GST cess for EVs has also been removed. In the Draft Battery Swapping Policy, NITI Aayog has also proposed cutting the GST on EV batteries from 18% currently to 5%.
- Several states, for e.g., Delhi, Maharashtra, etc., have also introduced individual policies[3] supporting the central government's initiative. For example, the Maharashtra government has introduced a scheme that offers an INR 5,000 subsidy per kWh of battery capacity (maximum subsidy of INR 10,000) for electric 2W and electric 4W (maximum subsidy of INR 1,50,000).

Promotion of local manufacturing:

- In addition to demand creation incentives, the government has also focused on creating a supply chain for EVs in India. Examples include the Advanced Chemistry Cell PLI[4] scheme, Auto and auto component[5] PLI with a combined budgetary outlay of INR 18,100 crore and INR 26,000 crore respectively, targeting cell production, other auto and EV components production and vehicle assembly.
- A Phased Manufacturing Program[6] has been introduced for EV components as guidelines for OEMs for receiving FAME-2 subsidy to enforce local content requirement
- Several states like Karnataka, Tamil Nadu, Maharashtra, etc., too have supported these initiatives by making EV manufacturing a focus sector and offering state specific incentives and schemes[7] to promote manufacturing.

With extensive policy support from the government at the central and state level, overall EV volumes are expected to grow to 30-35 lakh units by 2026 (excluding e-rickshaws) driven by different levels of adoption across vehicle categories. The 2W segment is expected to be the primary driver with 13-15% adoption, followed by 3W and 4W segments with 18-20% and 3-5% adoption respectively.

While these measures will help in bringing the overall Total Cost of Ownership (TCO) of EVs at par with ICE (Internal Combustion Engine) in many cases and facilitate the large-scale

adoption of EVs, it is essential for affordable financing options to be available to customers to further drive adoption.

Currently, ~50% 2W, ~90% 3W and ~80-90% 4W are financed in India[8]. Given the higher upfront cost of EVs, it is even more important to have low-cost financing solutions for EVs to make them an affordable substitute for ICE vehicles for the average Indian consumer.

Today, financing an EV remains a challenge with limited options available in the market along with unfavorable loan terms. Financiers too face challenges in providing competitive products due to real and perceived risks, given the nascency of the technology and the market. With growing EV adoption, the EV financing market is expected to grow to INR 45-55 thousand crore

Exhibit 1.1: EV financing opportunity in India

1. Only e-autos considered; e-rickshaws are excluded

by 2026. It is essential to understand and address the challenges being faced across the EV financing ecosystem to unlock the capital required to drive India's green transformation.

This report is focused on understanding comprehensively the challenges faced in EV financing today and also present initiatives for different stakeholders in the EV ecosystem that can act as potential solutions. The second chapter details the challenges faced by customers across vehicle categories along with the perspectives of financiers to understand the root causes for lack of affordable financing options for EVs, currently. In chapter three, an extensive benchmarking of best practices in India and across the globe has been carried out to capture innovative solutions. The last chapter, i.e., chapter four, proposes a holistic, multi-pronged agenda to accelerate the penetration of financing in the EV market to support adoption.

1.1 Approach & methodology

To understand the challenges in the EV financing market in depth across vehicle categories and use cases, we have split each vehicle category by usage and further by types of vehicles available within each category:

Electric 2Ws have been split into personal and commercial based on usage. Both low-speed EVs (maximum speed of 25 km/h) and high-speed EVs have been covered under each.

- Personal: Individual buyers purchasing vehicle for personal usage
- Commercial: 2W purchased for commercial usage across passenger (bike taxi / rental) & goods transportation (parcel delivery, food & grocery delivery)

Electric 3W L5 category has been covered for the following segments. L5 vehicles defined as 3W with maximum speed exceeding 25 km/h and motor power exceeding 0.25kW

- Passenger: Vehicles used for transportation of passengers from one point to another
- Cargo: Vehicles used for goods, parcel, and grocery delivery

Electric 4W category has been split into personal and commercial based on usage

- Personal: Individual buyers purchasing car for personal usage
- Commercial: Fleet operators providing services targeted for corporate customers (for e.g., CarsOnRent, EcoCars) and passenger segment / ride hailing services (for e.g., Ola, Uber, Meru)

In order to build a holistic view on the challenges in EV financing in India and to identify financing related pain points across vehicle categories, a comprehensive study was conducted with inputs from primary and secondary research and 60+ discussions across the ecosystem. This included discussions with dealers of 2W, 3W and 4W categories across cities and with financiers across banks, NBFCs and startups.

Note:

1. Low-speed 2W categorized as vehicles with maximum speed of 25 km/h; vehicles with maximum speed >25km/h considered as high-speed
2. L5 vehicles defined as 3W with maximum speed exceeding 25 km/h and motor power exceeding 0.25kW

Considering the well-established financing market for ICE vehicles, the EV financing landscape was benchmarked against ICE across vehicle categories to capture customer pain points and financier challenges.

To understand challenges faced by customers, 3 key parameters were evaluated:

- **Availability of loan options:** An evaluation of the number of financing options available across banks, NBFCs, and captive financiers and whether these financiers have representatives to educate customers at dealerships was done, to assess the depth of the EV financing market.
- **Ease of availing finance:** Factors such as the eligibility criteria, documentation required, steps involved in the credit underwriting process, and the turn-around time for disbursal were evaluated to understand if financial institutions have any additional checks for EV loans vs ICE.
- **Loan terms:** Terms and conditions set forth for the borrower by the lender were assessed across 3 key factors - the interest rates charged, maximum Loan-to-Value (LTV) ratios, and tenure options available.

From a financier's perspective, challenges were detailed out to understand the reason for pain points faced by customers. Potential support required by financiers to offer competitive products for EV financing vs ICE were also captured. Some of the key questions discussed with financiers are listed below:

1. Why are financiers skeptical when lending to EVs?
2. How do the two inherent risks in auto financing – asset risk and credit risk, differ for EV vs ICE vehicles?
3. What are the root causes for additional risks in EV financing across these parameters?
4. What are some innovative solutions which the financing ecosystem across startups & legacy players have come up with to solve for these root causes?
5. What support is required from other players like OEMs, government and other members of the ecosystem to provide affordable financing to EV customers in India?

Using the above-mentioned approach, a comprehensive view of current challenges was formed both from the customer and financier perspective. Details of specific challenges faced in each vehicle category are captured in the next section.

02

Key Challenges in EV Financing in India

2.1 Current financing landscape for EVs

Vehicle financing is driven by two primary underlying risks – asset risk and credit risk.

- Asset risk captures the risk associated with vehicle performance, maintenance, and resale value.
- Credit risk, on the other hand is driven by creditworthiness of the customer and his capacity and intent to repay.

The 3 parameters mentioned earlier, which are availability of financing, ease of financing and loan terms are driven by financier's confidence across both these risks. The current EV financing landscape, assessed across these 3 parameters, has been captured below in detail for all vehicle categories for personal and commercial segments.

2.1.1 Personal

In the personal segment there are 2 vehicle categories, 2Ws and 4Ws. Creditworthiness of customers in this segment has been observed to be good given the relatively stable income profile (for e.g., salaried or business owner, net monthly income post-tax, etc.). Hence, the key risk that financiers consider in this segment is the underlying asset risk.

Personal use-case | Financing gaps for EVs identified in 2W but not in 4W

		2W			4W	
		Low-speed EV	High speed EV	ICE	EV	ICE
Interest Rate Differential	Banks	1-4% higher interest rates charged vs ICE			Typically similar interest rates; 20-25 bps lower rates available under green loans	
	NBFCs	1.5-3% higher rates vs ICE typically; difference can be higher for low-speed vehicles			-	-
	Tenure (months)	18-24	24-36[1]	48	36-120[2]	36-84
	LTV	65-75%	75-80%[3]	Up to 95%	80-90%	80-90%

Exhibit 2.1: Loan terms in personal segment

1. 60-month tenure option available with Hero Fincorp; 36 months available only for top OEMs 2. Up to 10-year options available for green loans 3. Select banks offering LTV up to 90% for top OEMs
Source: Expert interviews; Dealer visits; BCG Analysis

> Financiers prefer to not be present in EV dealerships because of low sales volumes, they prefer connecting over call or provide brochure for reference
>
> —Multiple EV dealerships

> We have never given out an E2W loan in our branch, and hence not aware of green loans, you need to speak directly to our representative at dealership for more details
>
> —Branch manager, a national bank, Bangalore

In the 2W category, it has been observed that EVs are generally bought by customers whose credit profile is similar or marginally better than those of ICE, given the higher price of EVs compared to ICE. However, due to higher asset risk associated with EVs, especially for low-speed vehicles, there are limited options available currently and the loan terms are unfavorable compared to ICE for both low-speed and high-speed EVs.

- For low-speed vehicles, there are limited bank & NBFC options since the vehicles are unregistered. On the other hand, for high-speed vehicles, NBFCs are the primary lenders, with number of options available at dealerships being similar to ICE. Few banks, who are willing to lend, do so only to select OEMs offering high speed vehicles.
- NBFCs typically have stronger credit requirements for low-speed vehicles (e.g., salary slips/bank statements for a longer period; 6 months vs 3 months typically) while there is no difference between credit checks for high-speed EVs vs ICE. For high-speed EVs, banks however maintain a stricter credit assessment vs ICE loans.
- Loan terms offered are starkly unfavorable for both low-speed and high-speed vehicles.
  - Low Speed: Interest rates charged by banks are 1-4% higher vs ICE, while delta for NBFCs can be even higher. LTV offered is 20-30% lower while tenor available is also much lower (18-24 months vs 48 months for ICE).
  - High Speed - An interest differential of 1-4% vs ICE exists for banks while 1.5-3% for NBFCs. These are coupled with 15-20% lower LTV and lower tenor (24-36 months vs 48 months for ICE).

From a customer perspective, thus, there are limited financing options for EVs. In addition, the options available require higher down payment because of low LTV; and higher EMI because of high interest rates and lower tenors. Hence, affordability is a key concern for most customers in the personal space as higher financing costs can upset monthly budgets.

From a financier's perspective, the key risk that drives unfavorable loan terms is the asset risk, some of the reasons for which are mentioned below:

- There is uncertainty around life of the battery given the nascency of the technology.
- There is presence of multiple small OEMs with limited track record and inadequate service network. These smaller OEMs assemble imported kits with limited quality checks, raising concerns over product quality. In addition, the future of the OEMs itself is uncertain.
- The resale/salvage value of the batteries and the products is unknown.

Financiers, hence, design their loan terms to mitigate these risks. To limit their capital at risk, lower LTVs are offered, while higher interest rate is offered to cater to the concerns around OEM credibility, product quality & resale value. Uncertainty of battery life is managed by matching the loan tenures with the warranty offered on the battery, resulting in lower tenors for 2W loans.

When it comes to the personal 4W category, however, financing is usually much easier. EVs are offered similar options and financing terms compared to ICE.

- Banks, the primary lenders in the personal ICE 4W space, are willing to lend for EV models and hence number of options are similar to ICE.
- There is no difference in eligibility, documentation, or turnaround time for approval for EV loans vs ICE.

- Loan terms in the personal EV and ICE segment too remain similar. In fact, as a support to the government's effort to promote EVs, there are green loans available with some banks like State Bank of India and Union Bank, which offer a 20-25 bps discount along with higher tenor of up to 10 years.

Even though availability, ease and loan terms are comparable to ICE, information asymmetry does exist, with dealers and financier representatives unaware of green loan offerings by banks.

The comparable financing options for EV and ICE are driven by the fact that from a financier's perspective, both credit risk and the asset risk of 4W EVs is comparable to ICE. Given higher price for EVs, it has been observed that customers usually purchase this vehicle as a second car for intra-city use. Hence, financiers are typically confident of the customer credit profiles, lowering the associated credit risk. The asset risk associated is also lower than 2W, since only large OEMs like Tata, Mahindra, MG, Hyundai etc. have offerings in this segment. This provides financiers comfort on product quality and serviceability of the product even though the technology still remains unproven.

2.1.2 Commercial

In the commercial space, across 2W, 3W and 4W vehicle categories, asset is typically financed basis earnings from the vehicle. Hence, creditworthiness of the customer is dependent on asset utilization and business viability, thus adding more complexity in assessing the credit risk. Asset usage is also much higher than personal segment, resulting in additional concerns around the asset risk as well.

Commercial use-case | Financing gaps for EVs identified across all segments

		2W			3W - PASSENGER		3W - CARGO		4W	
		Low-speed EV	High-speed EV	ICE	EV	ICE	EV	ICE	EV	ICE
Interest Rate Differential	Banks	-	1-9% higher vs ICE		-	-	2-2.5% higher vs ICE		0.5-2%[1] higher vs ICE	
	NBFCs	2-3% higher vs ICE; difference more pronounced in case of low-speed EVs			1-7% higher vs ICE		1-8% higher vs ICE		-	-
	Tenure (months)	12-18	12-24	12-24	24-42	24-60	24-42	24-60	36-60[2]	48-60
	LTV	65-70%	75-80%	75-85%	70-90%	85-100+%	70-90%	85-100+%	60-70%	80-90%

Exhibit 2.2: Loan terms in commercial segment

1. Rates higher for passenger fleets (ride hailing) vs corporate fleets 2. Typically, 3 years for passenger fleets; 4-5 years for corporate fleets
Source: Expert interviews; Dealer visits; BCG Analysis

> Loans are currently not being given out on company names since subsidy is only available on the name of an individual; we recommend companies to buy multiple vehicles on the proprietor's name
>
> —Leading Electric 2W OEM dealership, Delhi

Electric 2Ws are mainly used by e-commerce players for food and parcel delivery. These vehicles are typically purchased by startups or aggregators rather than individual buyers and hence assessing creditworthiness of the firm and viability of business model plays an important role in determining credit risk. Current landscape for EV financing in this segment is as follows:

- Overall options are generally limited. Very few NBFCs and even fewer banks are willing to finance commercial loans across EVs (high speed or low speed) and ICE
- In terms of eligibility for loans, selective practices have been observed, for e.g., some NBFCs are unwilling to lend to proprietary firms or firms with >3 partners. Further, for loans on an individual rider's name, NBFCs typically lend only if the company is an established 3rd party logistics (3PL) provider or the end-client for the 3PL is a large e-commerce player.
- Loan terms for EVs are unfavorable vs ICE, especially for low-speed vehicles
  - For low-speed vehicles, interest rates are 2-3% higher vs ICE, combined with 10-15% lower LTV and lower tenor (12-18 months vs 12-24 months for ICE).
  - Interest rates are 1-9% higher for high-speed vehicles as well, along with 5-10% lower LTV. Tenor, however, remains same as ICE since the warranty offered on battery is similar to the maximum tenor offered for ICE loans (24 months).

> Banks are unwilling to lend to EV segment due to historically higher NPA problems, poor resale value of damaged battery, along with an underdeveloped secondary market
>
> —Leading EV OEM, Kanpur

Unlike 2Ws, electric 3Ws are purchased by both driver cum owners as well as fleet operators in the passenger and cargo segments. Since the customer profile in this segment usually belongs to the low-income group for both EV and ICE, individual creditworthiness plays and important role in assessing credit risk and eligibility for loans.

- NBFCs have been the primary lenders in ICE and continue to be the primary lenders in EVs with number of options available being similar across EV and ICE. Further, there are also various local, unregistered individual lenders ready to finance EVs at high interest rates. Banks rarely lend to 3W EVs across passenger and cargo segments.
- In terms of eligibility, home ownership or a guarantor is required in the case of cargo EV, while no such requirement is present in case of ICE or passenger EVs. Further, while similar documents are required across EV and ICE, several dealerships request for multiple blank post-dated cheques as collateral for financing EVs.
- NBFCs typically charge 1-7% higher interest rates for passenger EVs vs ICE and 1-8% higher rate for cargo EVs vs ICE, combined with 10-15% lower LTV and lower tenor (24-42 months vs 24-60 months for ICE). Local individual lenders are also a source of financing for this segment, charge a steep 25-[illegible]7[illegible] fixed interest rate p.a. for both ICE and EVs.

Electric 4Ws are used primarily in 2 commercial applications, corporate fleets and passenger services (OLA, Uber, etc.). Loan eligibility and loan terms are determined basis cash flow profiles of these 2 businesses.

- When it comes to the commercial EV space, all banks & NBFCs lending to 4W ICE customers are willing to lend for EV models.
- However, banks selectively lend to companies with an existing fleet greater than 50 or those servicing corporate customers given higher stability of cashflow vs fleets targeted for passenger services. Businesses falling outside this segment are generally financed by NBFCs.
- Interest rates are around 0.5%-2% higher for EVs vs ICE. The delta in interest rates is more pronounced for fleets used for passenger services. LTV offered for commercial EV loans is 10-20% lower while tenor is lower only for passenger fleets (3 years vs 4-5 years for ICE and corporate EV fleets).

From a customer perspective in the commercial category, lending practices remain selective along with stricter credit assessment for both EVs and ICE. However, for EVs, customers have to pay higher down payments because of lower LTVs and higher EMIs due to higher interest rates and lower tenors. In case of 3Ws, they have to bear an additional recurring capex for battery replacement every 4-5 years as well. Financing options for this recurring capex are currently very limited.

> We prefer financing only established logistics partners of successful E-commerce companies like Amazon, Flipkart. For new startups, EV loans even for high-speed vehicles, will not be offered with similar terms vs ICE
>
> —SVP EV Business, large NBFC

> We have stopped financing E3W due to high NPA problem that arises due to the customer segment that is unable to find a constant source of income due to uncertainty of work.
>
> —National Bank

For the financier, both the asset risk and the credit risk is higher in the commercial segment vs the personal segment. Asset risk is usually high for the commercial category given the high utilization requirement, but for EVs it is further amplified given the following:

- There is uncertainty around life of battery and performance, especially due to heavy usage.
- In the 2W and 3W category, there are multiple small OEMs catering to this segment with limited track record and inadequate service network, making it challenging for financiers to judge their product quality and vehicle uptime.
- There is uncertainty around the value that can be recovered in case of default. This is due to nascent secondary market for used EVs and batteries.
- Traceability of battery is low, especially for vehicles with detachable batteries

Financiers also face a higher credit risk in this segment. Given the higher cost of vehicle and the current loan options, higher down payment and higher EMI are a certainty for customers in this category. However, the customer's ability to service these financing costs through higher income (due to savings in fuel and maintenance) is dependent on number of kms run daily and number of deliveries made each day. Not only is this higher income variable, but these also exist concerns on the ability to earn this higher income due to challenges around operational ecosystem like range, charging infrastructure, electricity cost, etc.

This adds to the overall risk of the financier and as seen in the personal segment, financiers compensate for this additional risk through varying loan terms to limit their exposure.

2.2 Key challenges & risks associated with EV financing

In the previous section, key challenges observed in availability of financing, ease of financing and loan terms offered across vehicle categories were discussed in detail. Basis these observations, below is a summary of some of the key pain points customers currently face when they look for financing EVs:

1. **Higher initial down payment -** Upfront purchase price for EVs is typically higher than comparable ICE models. In addition to this, LTVs offered by financiers are also 10-30% lower depending on vehicle category resulting in significantly higher down-payment requirement.
2. **Higher EMI burden due to shorter loan tenor -** One of the key reasons for increased EMI is shorter tenor offered for EV loans. Tenor is usually anywhere between 6-18 months lower depending on the vehicle category, with maximum difference seen for low-speed electric 2Ws.
3. **Higher interest rate adding to EMI burden –** In addition to shorter tenors, interest rates are also 1%-7% higher for EVs vs ICE. In the commercial segment, across 2W, 3W (passenger and cargo), and 4W segments, interest rates are 1-4% higher. Maximum difference, however, was observed in the 2W space with a 2-7% difference in NBFCs lending for EV vs ICE
4. **Recurring capex with low financing options –** For electric 3Ws, battery replacement after 4-5 years acts as additional capex burden for the buyer with limited availability of financing options for the same.
5. **Limited access to funding –** Limited financing options are available to customers for EVs. In addition, there are no dedicated financiers to educate customers and sales representatives usually have very limited understanding of how the financial product works.

It is important to note that many of the pain points that are witnessed by customers primarily stem from challenges faced by lenders. Each of the pain points listed above is linked to one or more challenges faced by the financiers such as:

1. **Resale market is unestablished –** EV is a nascent sector and most products have not undergone a complete lifecycle yet. As a result, financiers are uncertain of the capital they will be able to recover from the asset in case of default.
2. **No assurance of product quality –** Financiers perceive a high risk of product failure for EVs especially in the absence of any certification framework guaranteeing performance. In addition to this there is a long tail of OEMs in the 2W and 3W markets offering EV products making it exceedingly difficult for financiers to establish credibility of each product.
3. **Battery life not known –** The life of the battery remains a key uncertainty for financiers. Loan tenors are typically matched to the warranty of the battery to minimize risk.
4. **Battery technology unknown –** EV batteries are a nascent technology in India and financiers have limited understanding of the technology to be able to judge what product specifications, materials, etc. will lead to better performance
5. **Increased customer risk –** While the customer profile purchasing EVs remains similar to ICE, the higher down-payment and higher EMIs lead to an additional customer risk as it adds to monthly burden when purchased for personal use and there is uncertainty in higher earnings when purchased for commercial use given the operational challenges which exist today.

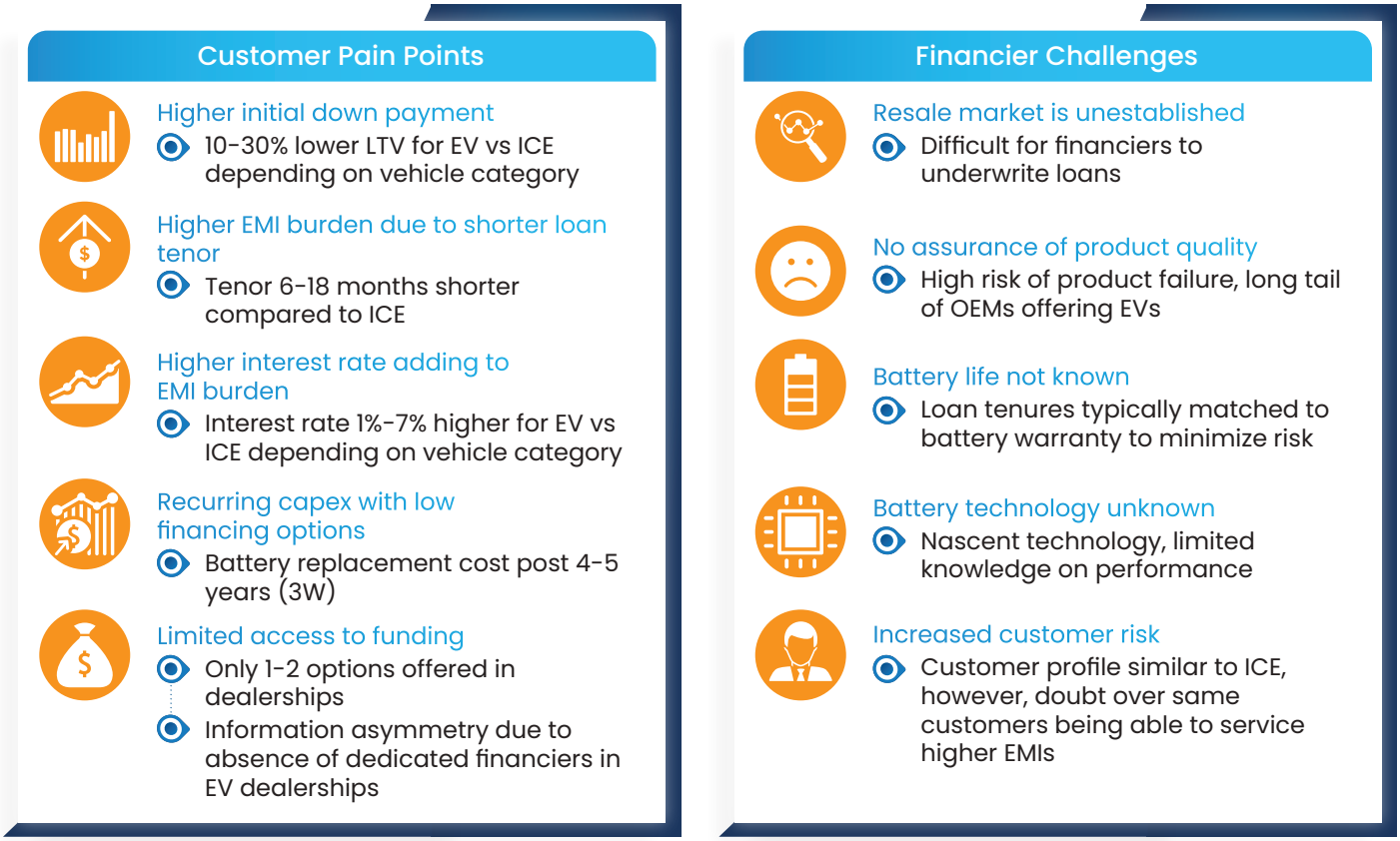


Exhibit 2.3: Customer pain points for EV financing stemming from challenges faced by lenders

2.2.1 Root causes of the challenges faced in EV financing

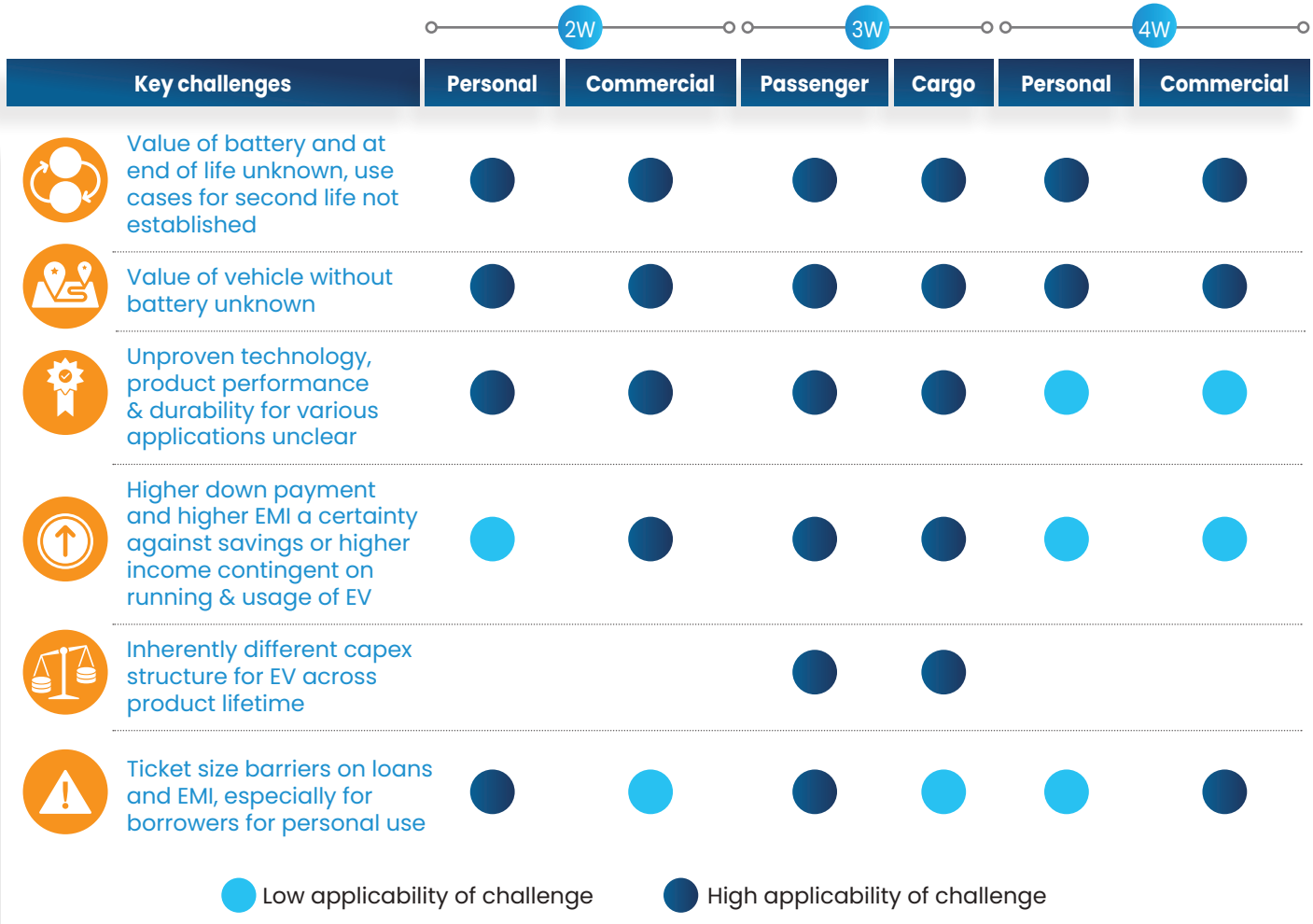
Overall, challenges faced in EV financing are rooted in 6 major risks currently surrounding EVs. These include:

1. **Resale value of the battery is unestablished**
   - The value of battery at the end of life is unknown, as use cases for second life or a secondary recycling market are yet to-be established.
   - Absence of information on usage and state of health (SOH) of battery further accentuates this problem. This is driven by unclear standards for batteries currently, for e.g., no clear mandate on BMS requirements, lack of data sharing regulations, etc.
2. **Resale value of the vehicle is unknown**
   - The value of the vehicle without a battery is unknown as there is limited understanding of the intrinsic value of the vehicle once the battery is used.
   - Secondary market for vehicles has not been established yet nor has understanding been developed on re-usability of a vehicle with a new battery.
3. **Unproven technology and product performance**
   - Given the nascency of the sector and the technology, there is significant skepticism regarding product performance and durability for various applications.
   - Absence of historic data on product performance under various loads, temperatures, or usage conditions further amplifies the above challenge.
   - In addition to this, there are a vast number of manufacturers in the electric 2W and 3W segments. Given the lack of certification and enforcement of safety standards, financiers are uncertain of the credibility of these OEMs since many of them are new to the market and are only assembling imported EV kits.
4. **Uncertainty in savings and earnings**
   - Consumers are uncertain on quantum of savings or net higher income they stand to earn from owning and operating EVs, while higher down payment and EMI is a certainty.

- Realization of higher savings for EVs is contingent on sufficient running and utilization of the vehicle. Given the operational challenges of range, charging network etc. savings or higher income potential is currently uncertain.
  - At present, it has been observed that, given sufficient utilization, there is a 1.2-1.5x increase in income, which comfortably offsets the 1.5- 1.8x increase in EMI burden. E.g.: An electric 3W cargo owner can earn almost INR 9,000-11,000 higher income due to savings in fuel and maintenance against an increase of INR 5,000-7,000 in EMI.

5. **Additional capex during life of vehicle**
   - EVs, especially 3Ws, inherently have a different capex structure. The battery needs to be replaced after 4-5 years of running. Given batteries make up 40-60% of the vehicle cost, this is a significant investment required during the life of the vehicle.
   - This adds to the capex burden of the buyer, especially because financing of this capex is currently unclear.
6. **Ticket size barriers**
   - Larger down-payments and higher EMIs preclude a large number of people from owning EVs personally. Borrowers are hesitant of taking up a higher EMI burden beyond a certain percentage of income, lest it disturbs the monthly budgets.
   - Financiers are also hesitant on giving loan amounts beyond a range to reduce capital at risk.

The root causes mentioned above are not homogenous across vehicle categories given different markets are at different stages of development and adoption in India. The applicability and degree of intensity as a challenge across the vehicle categories varies for different root causes.



The next section of the report focuses on what are the potential levers to tackle these inherent risks faced across EV categories.

03

Review of Innovative Solutions Present Across the Industry

To address the challenges detailed in the previous section, multiple entities across the world including governments, OEMs, financiers and startups have come up with a variety of solutions. The solutions evidenced can be categorized into 5 broad levers:

1. Absorption of additional risk in EV financing by the broader ecosystem to bring down the cost of borrowing for end customer
2. Restructuring of financial products to help mitigate challenges such as higher down payment or higher EMI through innovative models to improve cash flows for end customer
3. Reducing the risk of battery technology by addressing the uncertainty around battery performance and developing a secondary market for used batteries
4. Reducing the risk of product resale by developing secondary market ecosystem for used EVs
5. Creation of platforms to enable collaboration between different stakeholders and channelize capital for EV financing

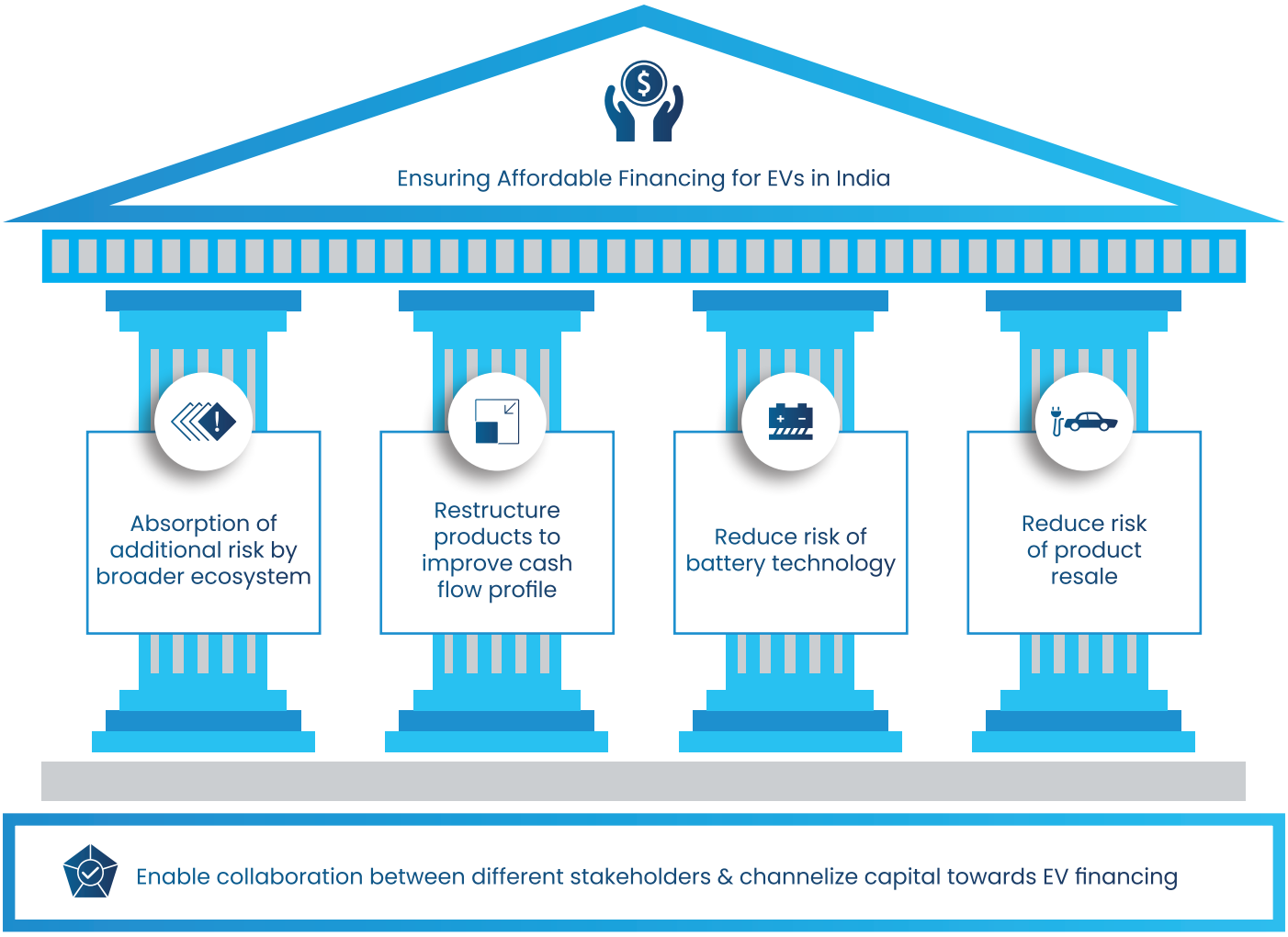


Exhibit 3.1: 5 thrust areas to drive penetration of EV financing

The 5 levers address different risks surrounding EVs. Each lever targets specific risks out of those mentioned in the previous section. The first lever, absorption of additional risk by broader ecosystem, aims to solve for additional risk added to EV loans due to all challenges surrounding EV ecosystem today. The lever comprises of various funding mechanisms which 3rd parties can use to provide low-cost funds for EVs. These funding mechanisms include grants, guarantees, green bonds & asset backed securities, debt, debt with first loss guarantee, equity and equity with first loss guarantee. The second to fourth levers, however, solve for different risks through different levers like creation of a secondary ecosystem for batteries and vehicles, reducing EMI burden of customers through flexible loan structures, etc. The fifth lever aims at creation of overarching platforms by the government specific to EV financing,

to facilitate collaboration across stakeholders. These platforms will serve as a think tank to dissipate information, drive ideation, incubate and scale innovative financial models and channel capital to EV financing

In the exhibit below, key challenges addressed by each lever are detailed. While the first lever, covers additional risk added by all the challenges, other levers target to address specific root causes.

Key challenges	Absorption of additional risk by broader ecosystem	Restructure products to improve cash flow profile	Reduce risk of battery technology	Reduce risk of product resale
Value of battery and at end of life unknown, use cases for second life not established	✓		✓	
Value of vehicle without battery unknown	✓			✓
Unproven technology, product performance & durability for various applications unclear	✓		✓	✓
Inherently different capex structure for EV across product lifetime	✓	✓		
Higher down payment and higher EMI a certainty against savings or higher income contingent on running & usage of EV	✓	✓		
Ticket size barriers on loans and EMI, especially for borrowers for personal use	✓	✓		
	Enabled by collaboration of stakeholders & channelizing capital			

Exhibit 3.2: Root causes targeted by 5 key thrust areas

In the subsequent parts of this section, an extensive benchmarking has been done to detail select examples that have attempted to innovate in the space of EV financing by using one or more of the above-mentioned levers.

1. Access to low-cost funding through equity with first loss guarantee for creating an E-Mobility financing platform

Entities Involved	Green Climate Fund, Macquarie Group
Geography	India
Levers Addressed	Absorption of additional risk by broader ecosystem

The Green Climate Fund[9] was established within the United Nations Framework Council on Climate Change (UNFCCC) to assist developing countries in reducing their CO_2 emissions through investment in green technologies. It is funded by 49 sovereign member states. The Fund has accredited Macquarie's asset management arm to propose climate projects to GCF that would access the Fund's financial reserves. In this proposal[10] the Macquarie group asked GCF for $200 million in equity investment, to create an 'E-mobility platform' with an objective to promote EV financing in India through financing the e-mobility space. The project has been approved in May 2022 and implementation is currently underway.

The platform in the first phase will be funded through equity funding. $200 million will be invested by GCF, which will act as a first loss guarantee fund, and the remaining $205 million will be invested by other commercial investors like venture capitals, private equity investors, FIs., etc. to be identified and onboarded by Macquarie. The platform will operate as an NBFC and provide both equity (through project financing structures) and debt financing (through low interest loans along with other modes like leasing) primarily to B2B players (fleet operators, OEMs, government entities, infrastructure players). The initial target sectors are electric buses, shared / corporate 4W fleets and electric vehicle charging infrastructure projects. Macquarie aims to raise another $1.1 billion from local and international debt markets in the second stage for expansion of the platform to B2C lending to reach a wider audience. The proposed model for the fund is illustrated below. On the back of this structure the platform aims to attract other commercial capital that would otherwise be hesitant to invest in this nascent sector.

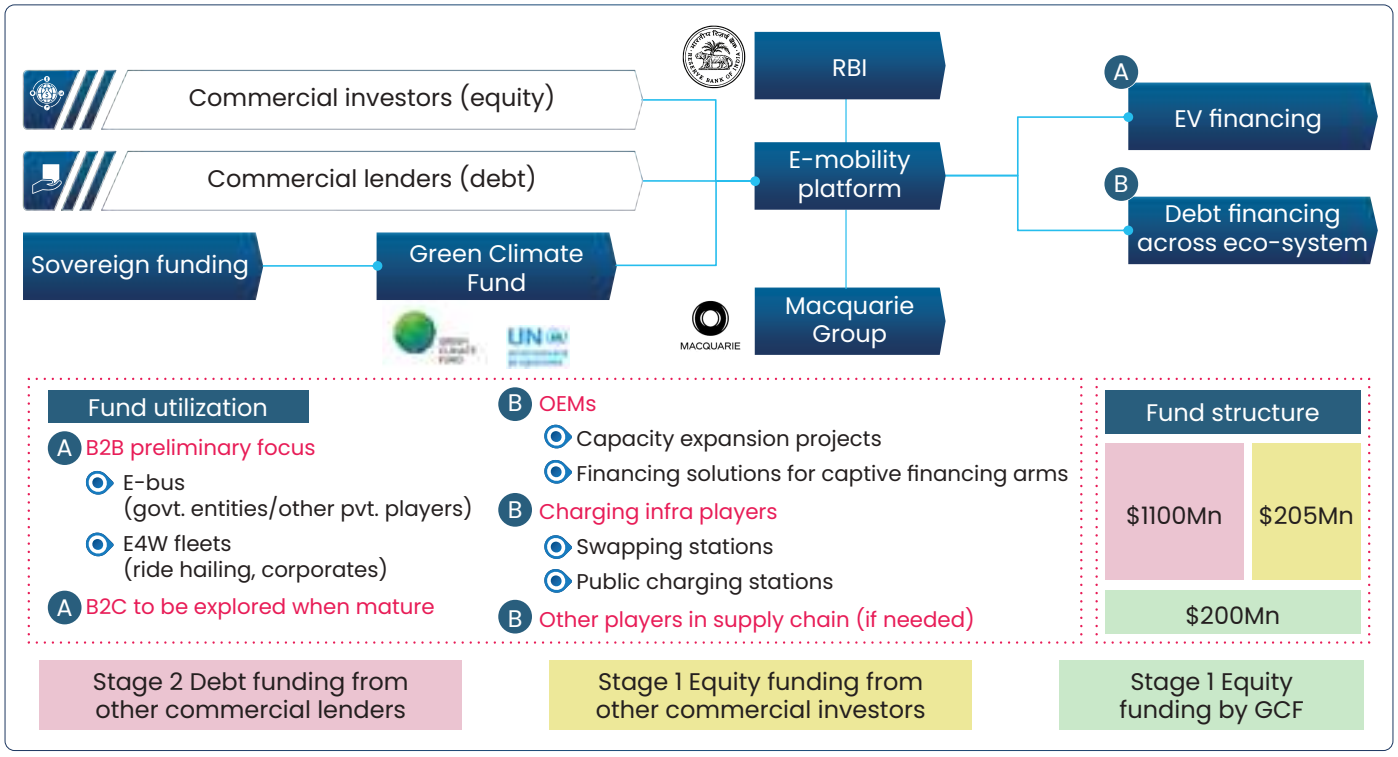


Exhibit 3.3: Illustrative model for GCF funding for E-Mobility financing platform

2. Funding by Green Climate Fund, DBSA and Convergence through a mix of debts and grants with first loss guarantee

Entities Involved	Green Climate Fund, Development Bank of Southern Africa (DBSA), Convergence
Geography	South Africa, Lesotho, Namibia, Eswatini
Levers Addressed	Absorption of additional risk by broader ecosystem

As mentioned in example 1, the Green Climate Fund assists developing countries in reducing CO_2 emissions by investing in green technologies. In this instance, GCF invested in the Climate Finance Facility created by DBSA[11], a development financial institution (DFI) owned by the Government of South Africa. The Climate Finance Facility Program (CFF) is a division set up within DBSA to finance local sustainable projects with difficulty in raising funding through pvt. players due to high risk / low clarity on project. The CFF will prioritize investment opportunities basis the needs of target countries (South Africa, Lesotho, Namibia, Eswatini) and priorities identified in the Paris Agreement to meet the United Nations Sustainable Development Goals.

The CFF raised $110 million initially through DBSA and GCF as the primary investors[12]. DBSA contributed $55 million as a 15-year loan and GCF contributed $55 million through DBSA as an accredited entity of GCF. In addition to the loans, both organizations also contributed $0.6 million grants each for set-up costs. Convergence, a grant provider for proof-of-concept stage innovative financing instruments, also supported the program as a design partner and provided $0.33 million funding.

The CFF will offer an investment of $5 - $10 million using two key financial instruments – subordinated debt / first-loss guarantee and credit enhancement (e.g., tenor extension) for projects in 3 sectors solar, water and clean mobility (EV fleet financing). Both these financial instruments will increase confidence of private investors to co-lend to these projects.

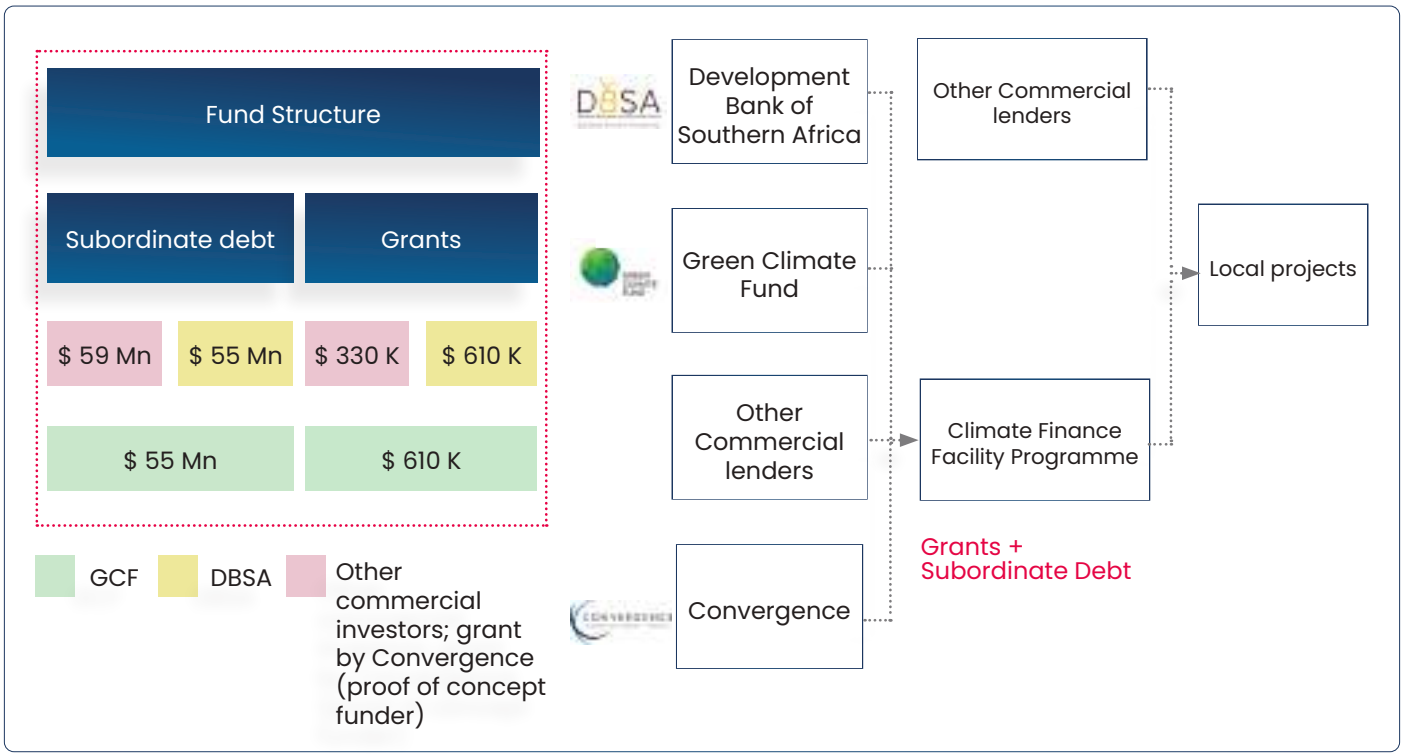


Exhibit 3.4: Funding structure for the Climate Finance Facility

3. Leased asset backed green bonds by BYD and Didi

Entities Involved	BYD, TF Securities, Didi
Geography	China
Levers Addressed	Absorption of additional risk by broader ecosystem, Restructure products to improve cash flow profile

BYD, one of China's largest auto manufacturing companies, issued the first EV leasing backed ABS in the Chinese market in 2018. The RMB 366 million deal was backed by 24 EV leasing claims related to 17 different lessees[13]. The originator of the bonds was Shenzhen BYD International Financing Leasing, a subsidiary of BYD and the issuer was Tianfeng Securities, an investment management company. Most of the lessees were affiliated to Didi, a company that provides app-based transportation services, including private car-hailing, social ride sharing, bike sharing and on-demand delivery services. The proceeds of the issuance were allocated to finance both of their direct-leasing and their sales-and-leaseback operations. Future leasing revenue generated from the customers acted as security for investors in the green bonds to receive returns.

This issuance helped BYD raise capital from private market against EV leases. Private investors traditionally viewed investing in such individual leases as too small and too risky, thus increasing the cost of capital. Aggregating small leases into a securitized pool of assets helped create an adequate deal size, reduced risk and improved credit rating thus providing investors higher confidence for investing at lower cost. It also helped distribute the underlying risk of EV leases over a larger base of investors.

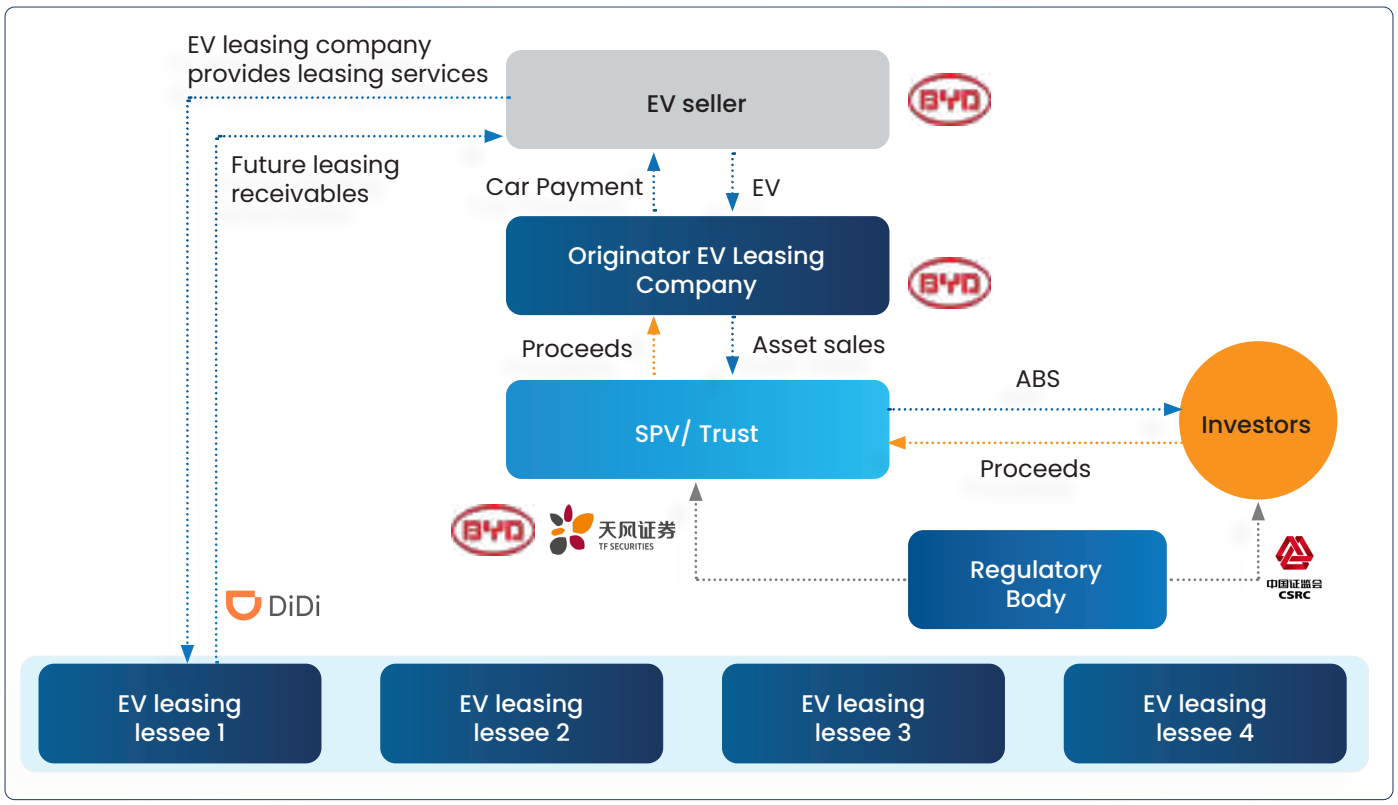


Exhibit 3.5: Illustrative model for leased asset backed green bonds

Since 2018, many EV leasing companies have opted to go for financing through securitizing their bundles of leasing claims. Given the characteristics of EV leases, they offer relatively stable and consistent cash flow stream to the ABS originator to cover interest and repayment. The green bonds market is regulated by CSRC, primary regulator of security industries in China.

4. Green Bonds for low-cost financing

Entities Involved	Hyundai Card, Hyundai, Kia motors, Societe Generale, Sustainalytics
Geography	South Korea
Levers Addressed	Absorption of additional risk by broader ecosystem

Hyundai Card's KRW 350 billion sustainability asset backed securities (ABS) is a pioneering approach to securitization[14]. Hyundai Card is a credit card company and the captive financing arm of Hyundai, the parent company of South Korea's leading EV OEMs Hyundai Motors and Kia Motors. The company issued sustainability bonds, through an arrangement by Societe Generale (a global financial institute), to finance purchase of zero emission vehicles of Hyundai and KIA, particularly by low-middle income segment Hyundai card holders and to support them by providing them access to financial services. The ABS issuance combined both green and social criteria and was pursuant to Hyundai Card's Sustainability Financing Framework. To maintain transparency, Hyundai will also report on the use of proceeds from this ABS in an annual sustainability report from the investor.

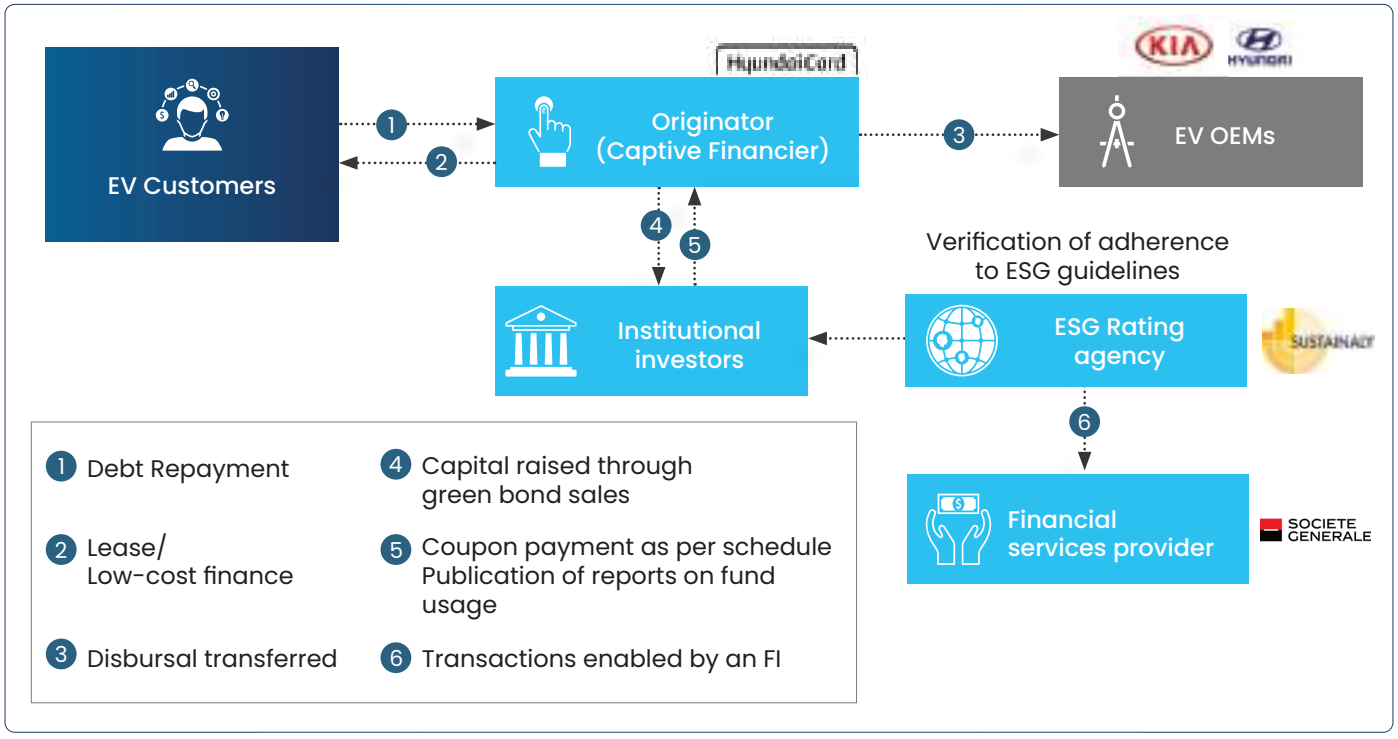


Exhibit 3.6: ABS mechanism for Hyundai Card

Societe Generale acted as the Sole Lender and Sole Sustainability Coordinator on the transaction, which was also the bank's first sustainability ABS globally. Sustainalytics, a leading ESG research, ratings and data firm, provided an independent opinion on alignment of Hyundai Card's Sustainability Financing Framework with Sustainability Bond Guidelines 2021, Green Bond Principles 2021, Social Bond Principles 2021, Green Loan Principles 2021, and Social Loan Principles 2021.

Loans to middle income segments are generally considered risky and hence the cost of raising capital for such loans is generally higher. By combining EV loans and receivables from financial services provided to card holders, the overall risk of default and other credit risks were minimized to a fraction of the underlying assets. This reduced the cost of capital, distributed risk of loans and provided Hyundai Card access to funding which could be used to issue more loans to help grow the EV market.

5. Guarantor model to cover risk and boost credit by Eqaro Guarantees

Entities Involved	Prest Loans, Eqaro Guarantees, Terra Motors
Geography	India
Levers Addressed	Absorption of additional risk by broader ecosystem

Prest Loans, a Delhi-based digital lending company forayed into financing EVs last year through a guarantor model. The company has collaborated with Terra Motors, a leading Japanese EV manufacturer, and Mumbai-based Eqaro Guarantees[15].

Prest Loans will finance approximately 70-80% of the value of EVs. For credit assessment, they have a risk-based scoring mechanism called 'Prest Score' to analyze borrowers using non-financial metrics. Under the three-way agreement, Eqaro Guarantees extends credit default guarantees underwriting the customer risk and boosting confidence for Prest Loans and enabling them to offer better loan terms. The loans are currently offered for vehicles produced by Terra Motors including E-rickshaws, E-carts, loaders, delivery vehicles, etc. to both individuals as well as corporate buyers. Terra Motors offers product quality assurance and buyback guarantee for repossessed vehicles in case of default under the agreement.

By providing a guarantee in case of credit default and a buy-back agreement with the OEM, Eqaro is willing to share the underlying asset risk and the credit risk of the customer with Prest Loans. These measures help distribute the underlying risks for Prest loans and gives them comfort to provide better loan terms to customers. In addition, presence of guarantors and counter guarantors helps improve the credit rating of Prest loans, thus reducing their cost of capital and increasing their ability to raise debt.

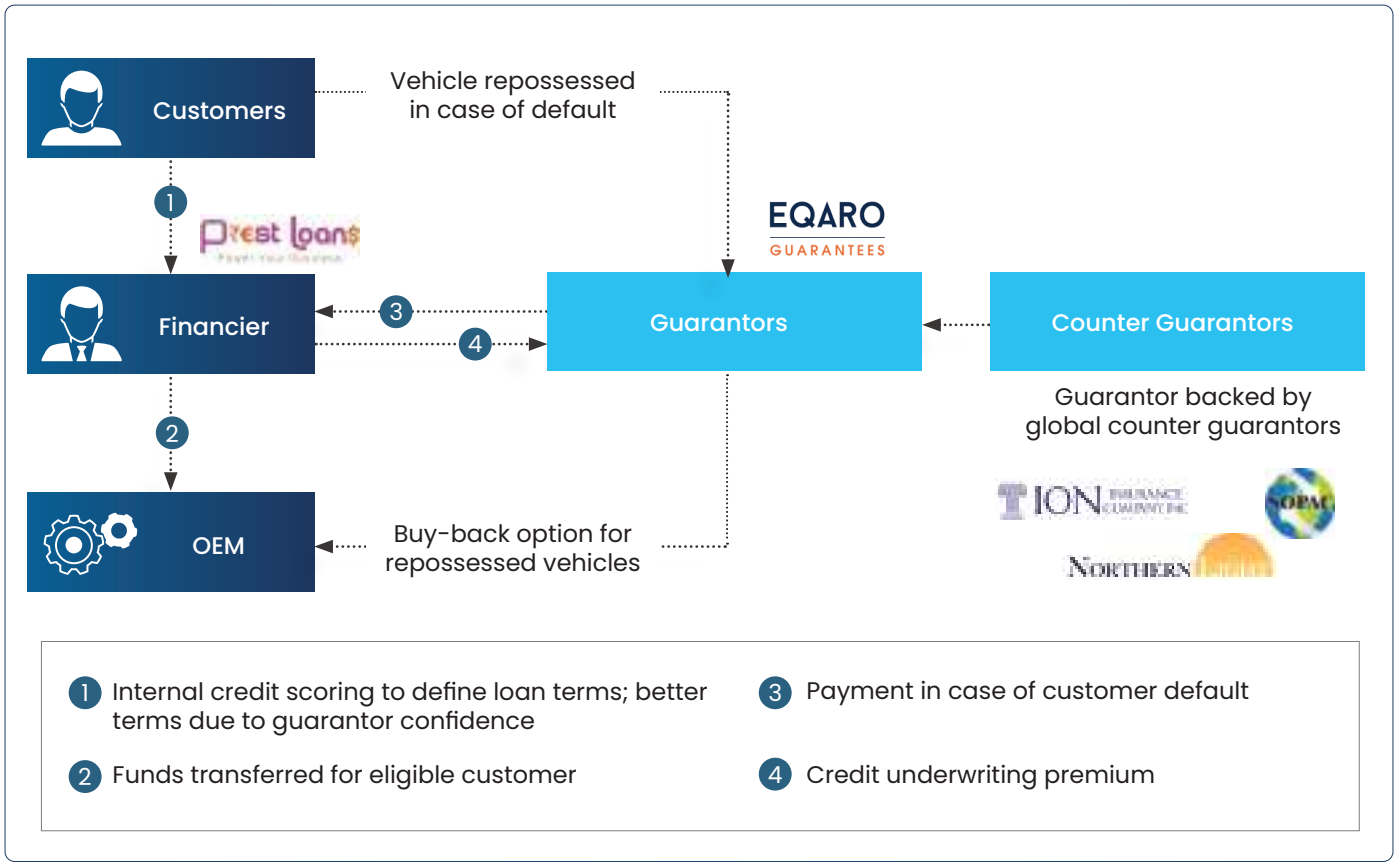


Exhibit 3.7: Guarantor model employed by Prest Loans

6. Interest subvention through an on-lending asset finance program by CEFC

Entities Involved	CEFC Australia, Multiple retail banking institutions, for e.g., Bank of Queensland, ANZ, Firstmac, etc.
Geography	Australia
Levers Addressed	Absorption of additional risk by broader ecosystem, Restructure products to improve cash flow profile

The Clean Energy Finance Corporation (CEFC) is a Green Bank, wholly owned by the Australian Government, created in 2012 facilitate financing the clean energy sector by investing AUD 10 Bn on behalf of the Australian government. Through its asset finance program, CEFC has formed multiple partnerships with retail banks to provide financing for EV projects (including fleet procurement and charging infrastructure). The partnerships are structured through an on-lending model where CEFC provides capital to banks who disburse these funds to the customers[16]. CEFC provides the capital as wholesale financing to the banks and is not exposed to any of the credit risk from the customer or asset. Hence, the funding is provided at a lower cost to the banks who in turn use these funds to provide benefits like 70 bps subvention vs ICE vehicle financing, longer tenures, etc.

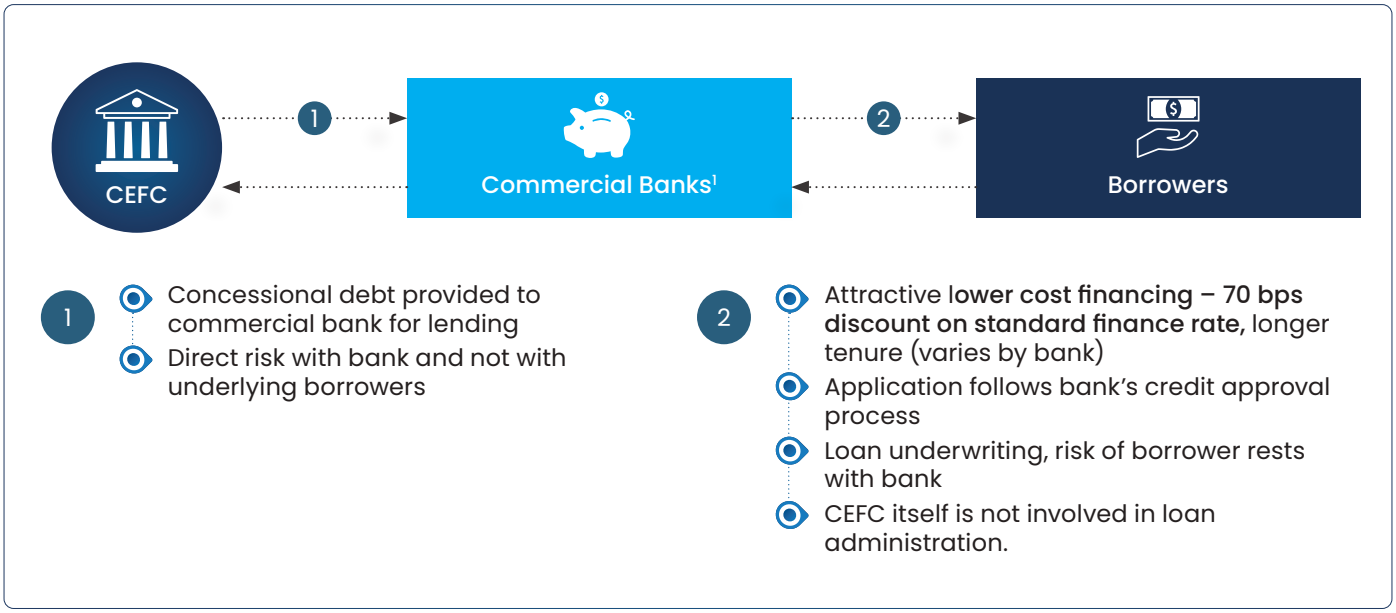


Exhibit 3.8: Illustrative model for CEFC asset finance program

A total of AUD 800 Mn has been disbursed through CEFC's aggregation of partnerships till 2019-20 and >5,000 low and zero emission vehicles have been financed. An average investment of AUD 73,000 has been done per project with some project receiving loans as low as AUD 2,000. CEFC has been able to achieve a return of 1% over the Australian Government Bond rate through this program (target return – 3-4% over Australian government Bond rate)[17]. CEFC also works with banks to securitize debt, pool granular assets, and attract capital from large scale investors, e.g., issuance of certified green bonds.

7. Guarantor model employed by demand aggregators and fleet owners

Entities Involved	3rd party logistics providers, for e.g., Shadowfax, Zyngo
Geography	India
Levers Addressed	Absorption of additional risk by broader ecosystem

Customers in the 3W segment who purchase vehicles for commercial applications usually belong to the low-income segment with limited or no credit history and are hence seen as high-risk customers by financiers. In addition, the asset risk of EVs in terms of life and battery performance and the need for high utilization to offset higher EMI burden, further exacerbates the challenges to offer affordable financing solutions.

3rd party logistics providers like Shadowfax, Zyngo, etc. are employing a guarantor model where the fleet aggregators act as a partial credit guarantor for full time driver partners, thus sharing default risk with the financier. They in turn offer fixed monthly payments / utilization guarantees to their driver partners, ensuring drivers can service their EMIs. These fleet operators have a better understanding of the technology, have better visibility on utilization levels possible with E-commerce / industry partners and hence are in better position to assess and guarantee individual driver partners.

Below are some salient features of the model:

Credit Assessment and loan terms: Fleet aggregators usually tie up with financiers to provide loans to their drivers. The financier conducts credit assessment of the aggregator's business model, instead of the driver's credit history and provides loans basis aggregator's balance sheet. This helps financiers reduce customer risk and provide loans at attractive terms.

Loan disbursement and repayment: While the loan is disbursed on the driver's name; the EMI is paid to the financier by the fleet aggregator, who deducts the EMI from the driver's monthly salary. The driver's salary could be structured on pay-per-order or as a fixed monthly income, depending on the business model, and he receives a net salary post EMI. Some fleet aggregators also cover the down payment required to purchase the vehicle. In case the driver discontinues employment with the fleet aggregator during the loan tenure, the fleet aggregator usually re-possesses the vehicle and finds another driver for the vehicle.

Other expenses: It has been observed that at times, fleet owners have tie-ups with battery swapping or charging networks and AMCs with OEMs, thus helping drivers further in achieving TCO parity and reducing risk of defaults.

As an extension to the above model, large fleet owners are also exploring setting up an asset company for EVs, wherein the vehicles are purchased in bulk and sold or subleased to drivers.

8. Sun Mobility: Segregation of battery and vehicle financing

Entities Involved	Sun Mobility
Geography	India
Levers Addressed	Restructure products to improve cash flow profile

Sun Mobility, an energy infrastructure and services provider, has recently introduced the concept of Energy-as-a-service provider by launching battery swapping operations for E2W, E3W, and E-buses. They enable OEMs to sell swappable battery models so customers can purchase vehicles without batteries, while they provide batteries and charging infrastructure bundled as a pay per use model. Customers are billed per swap of battery at the battery swapping station. 3 battery swaps cost ~Rs. 160 with approximate travel around 120 km.

The model has many benefits in terms of financing:

- Reducing the upfront cost by ~25% (approximately Rs. 75-80k) and down payment by Rs. 15-20k
- As loan amount reduces, EMI also reduced by ~20% with total monthly costs (including fuel, maintenance, and EMI) lower by 10% vs fixed battery EVs

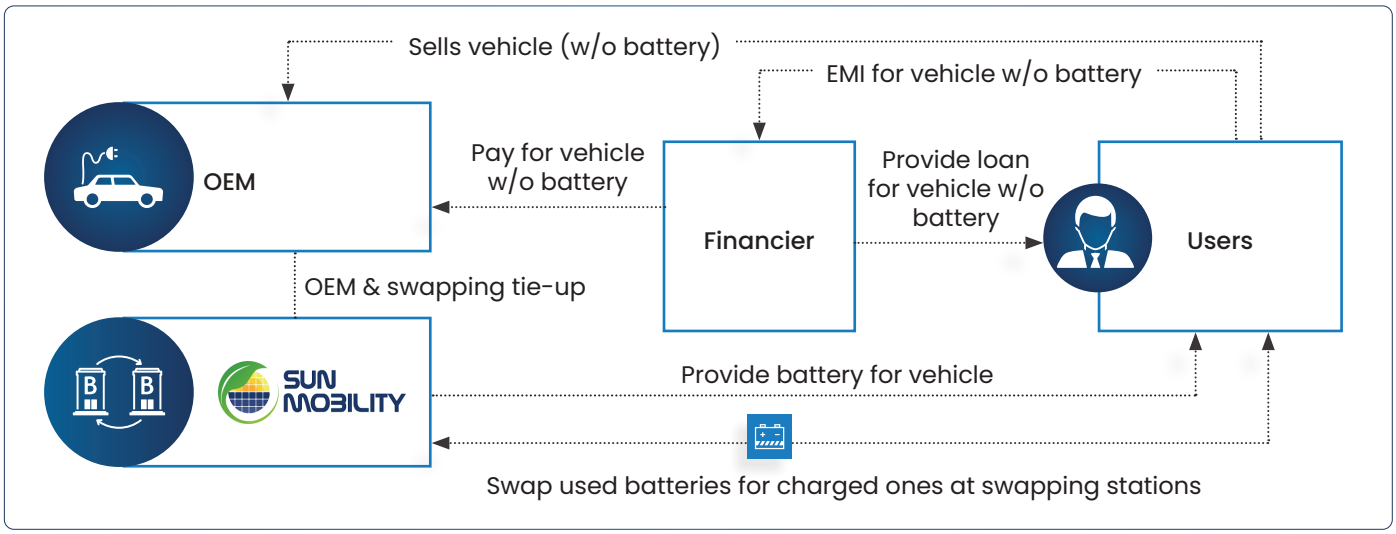


Exhibit 3.9: Sun Mobility business model

The battery swapping stations are located primarily in petrol pumps through partnership with petrol chains for wider network footprint. The company also offers additional services like software app for customers to track battery health, enable digital payments and GPS system ensuring traceability of battery for financier[18]. The business model is enabled by a host of partnerships:

- OEMs – Piaggio, Omega Seiki, Hero Electric
- Fleet Owners – Zyngo, Uber, Zypp Electric
- Real estate provider – Indian Oil Corporation Limited
- Energy provider – Tata Power
- Software provider – Microsoft
- Other strategic partners – Bosch, Vitol

9. Three Wheels United: Funding innovative models through focused fund

Entities Involved	Three Wheels United, Debt, Equity & Impact Investors
Geography	India
Levers Addressed	Absorption of additional risk by broader ecosystem, Restructure products to improve cash flow profile

Three Wheels United is a microfinance institute in India that offers up to 100% debt financing for auto-rickshaws, without any collateral, at similar interest rates, but longer tenures (48 months as compared to 24-36 months) and no charge for late repayments for a set period. This reduces down payment by 25-30% and EMI burden by 15-20%. They are able to offer these terms by harnessing technology and using innovative credit assessment and collection mechanism. From a business model perspective, the company channels low-cost funding through a mix of debt, equity, and concessional capital (in the form of partial credit guarantee or impact capital) to disburse 3W loans. The company has gone through multiple rounds of funding securing both equity investments from VCs and foreign and local debt. Securing impact capital has been a key differentiator for the company to reduce its overall cost of borrowing[19].

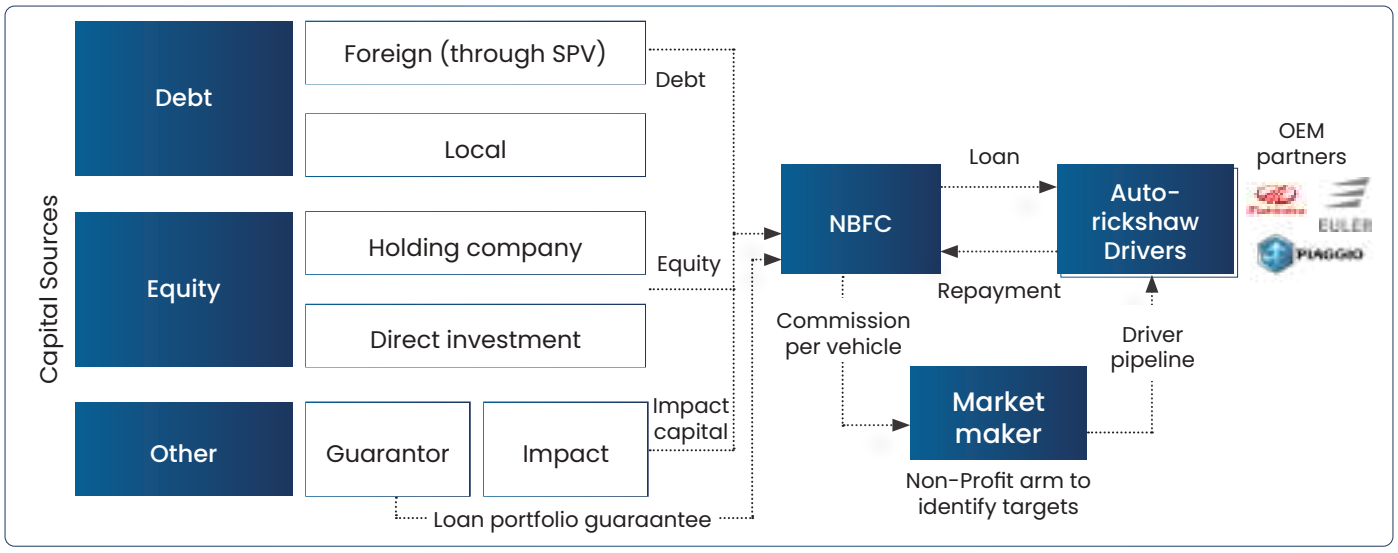


Exhibit 3.10: Illustrative business model for Three Wheels United

Some of the key features of the business model are as follows:

- **Innovative loan appraisal:** The driver is introduced to the instrument via other community members. To be eligible for financing, the driver is first asked to save a certain amount of money in a pre-decided number of days. If the driver can save the requisite amount in that period, he is then assessed basis parameters like number of rooms in the house, earning members, etc to judge repayment capacity. The credit assessment process goes beyond traditional factors like income statements, credit score, etc[20].
- **Community based model for collections:** Drivers or borrowers are put in teams which compete against each other. The teams have to ensure all members service their complete monthly EMI on time each month to earn points. Cash discounts are also offered as incentive for repayment[20]. Adding the element of social recognition in the collection mechanism has allowed the company to keep its NPAs at less than 1% currently.
- **App based collection to realize operational efficiencies:** Through online payments, the company is able to reduce its collection costs. It allows the company to keep a track of the existing loan terms / features, the payment due, etc. It also optimizes workflow for the field collection agents, helping them prioritize drivers who require more attention.

10. Vidyut Tech: Decoupled financing for battery and vehicle along with interest free 2nd loan with tie-ups for battery recycling

Entities Involved	Vidyut Tech, Lohum, NBFC investors
Geography	India
Levers Addressed	Absorption of additional risk by broader ecosystem, Restructure products to improve cash flow profile, Reduce risk of battery technology

Vidyut Tech is a Fintech offering end-to-end solutions for wEV purchase, financing and resale with 2 unique product options - interest free loans and split loans for battery & EV[21].

i. Interest-free loans on 2nd battery: Battery replacement after 4-5 years is a major capex for 3W drivers. Through back-to-back tie ups with NBFCs, they have created a first loss default guarantee structure that provides comfort to NBFCs and allows VidyutTech to extend unique financial products. The loan offering includes an interest-free loan on 2nd battery which is included with the initial purchase of vehicle. The company also re-possesses the old battery of the vehicle which it then sells to Lohum, a battery recycling agency with whom VidyuTech has a tie-up. Lohum provides a fixed price for used batteries to them assuring a floor price of battery.

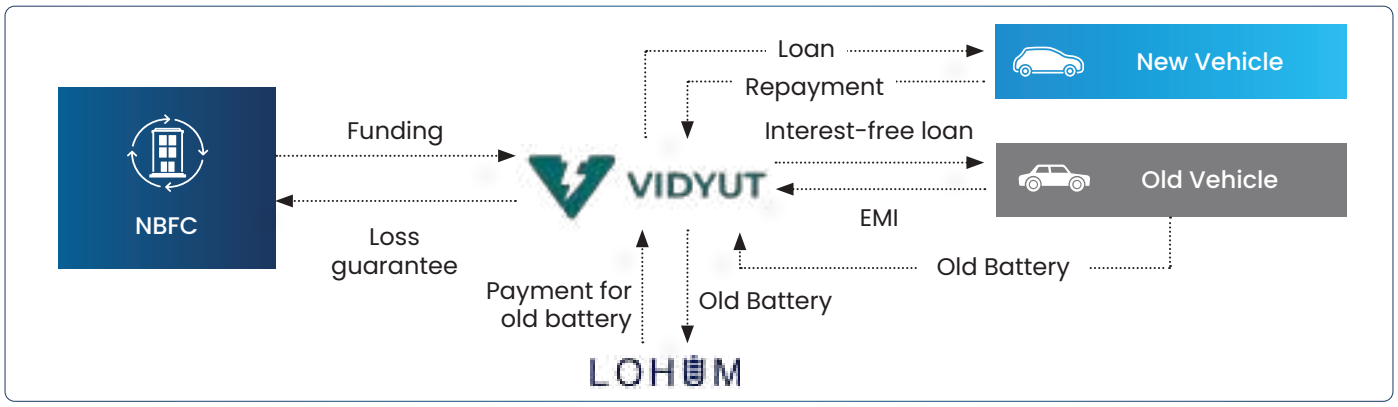


Exhibit 3.11: Illustrative model for Vidyut Tech (1)

ii. Split loans for battery and EV: Loans for battery and vehicle without the battery are sold as a bundled product. While the vehicle is financed through loans, the battery is leased out to the customer. The battery lease is structured to receive payments on a per km basis from the customer. Details on usage of the battery are received from the telematics data from BMS, for which VidyutTech has tied up with OEMs for access to this information. The decoupling of battery and vehicle reduces both upfront down payment and EMI burden for customers making economics of owning EV similar to that of ICE. Vidyut Tech is also exploring the options of securitizing the proceeds from battery leasing, helping them manage the cash flows better and scale the model.

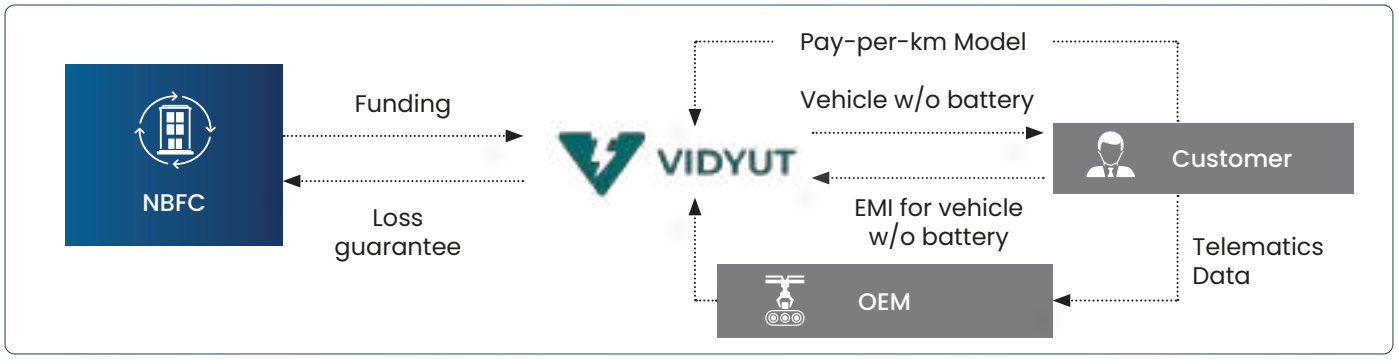


Exhibit 3.12: Illustrative model for Vidyut Tech (2)

11. Pay per mile subscription model by Spring Free EV

Entities Involved	Spring Free EV
Geography	USA
Levers Addressed	Restructure products to improve cash flow profile

Spring Free EV is a financial technology company with the objective of driving adoption of EVs through innovative financing solutions. The company provides solutions for both individual drivers targeting commercial applications and fleet owners. The aim for both these products is to remove the upfront cost barrier for EV adoption and transform the high capex into a usage based opex model.

For ridesharing and delivery drivers, the company has launched a financial product called Free EV[36] which offers EVs at zero down payment and no EMIs. Customers are only charged on a pay-per-mile basis with charges starting as low as 30 cents per mile

To enable this model, Spring Free EV has partnered with OEMs and offers this product on the 2022 Nissan Leaf S and 2019 Hyundai Kona EVs. Customers are required to submit a refundable of security deposit of $1,000 and a registration fee of $250. Subscription is offered for a maximum duration of 3 years, with a minimum commitment of 1,000 miles per month. If the driver drives under the minimum commitment, they are still charged for the minimum mileage specified in the agreement. For EV fleets the company offers another pay-per-mile financing product, EV InstaFleet[36]. The company charges a base monthly fee plus a fee per mile driven from fleet owners. Fleet owners are required to keep the vehicle for at least a year and a minimum number of miles.

12. Battery certification & traceability of battery health through Unique ID

Entities Involved	Global Battery Alliance, Underwriters Laboratory, IEC
Geography	Europe
Levers Addressed	Reduce risk of battery technology

i. Battery certification

Battery certification procedures and mandates in Europe are made at a country specific level. For example, in Germany, Underwriters Laboratory (UL) accredited by KBA, Transport Ministry of Germany, to certify battery safety for OEMs[22]. Battery safety standards are mandated basis ISO, UL, ECE standards in Germany. The R136 standard refers to testing for safety requirements across multiple mechanical, electrical, and thermal metrics. Testing is done across multiple metrics - battery robustness for vibration, thermal shock and cycling, mechanical shock and integrity, fire resistance, external short-circuit protection, overcharge and over discharge protection, over temperature protection. UL also conducts performs & ageing tests for EV batteries under the IEC 62660-1:2018 standard[23]. The tests include the following:

- Ageing testing: Storage test (charge retention and storage life), cycle life, no-load SOC, SOC loss at storage
- Performance testing: energy density and capacity at different temperatures and discharge rates, power density and internal resistance, energy efficiency, cranking power at low and high temperatures, etc.

ii. Battery recycling and second life use case

The EU Proposal for Waste Battery Regulation 2020[24] lays down regulations on second life of batteries, recycled content requirement and target recovery rates for raw materials.

- For second life of batteries, the regulation proposes that repurposed or remanufactured batteries need to comply with EU Battery Directive 2006 excluding requirements on carbon footprint, recycled content requirements, performance and durability, supply chain due diligence if repurposed/ remanufactured battery was placed for 1st Life onto market prior to effectiveness of the respective regulations. The regulation views 2nd life applications neutrally and puts no obligations on these batteries.
- In terms of recycled content requirement, targets proposed for Cobalt are, 12% recycled content needed by 2030 and 20% by 2035; for Nickel, the respective targets are 4% and 12% while for Lithium they are 4% and 10%. OEMs will need to document, and report recycled content of these materials starting 2027.
- Targets on recovery rates and recycling efficiency are also proposed which will apply to all waste batteries. Recycling efficiency targets are set at 65% of average battery weight from 2025 and 70% of average battery weight from 2030. The target recovery rates on materials and effective dates are detailed below:

Date	Cobalt	Lithium	Nickel	Copper
1/2026	90%	35%	90%	90%
1/2030	95%	70%	95%	95%

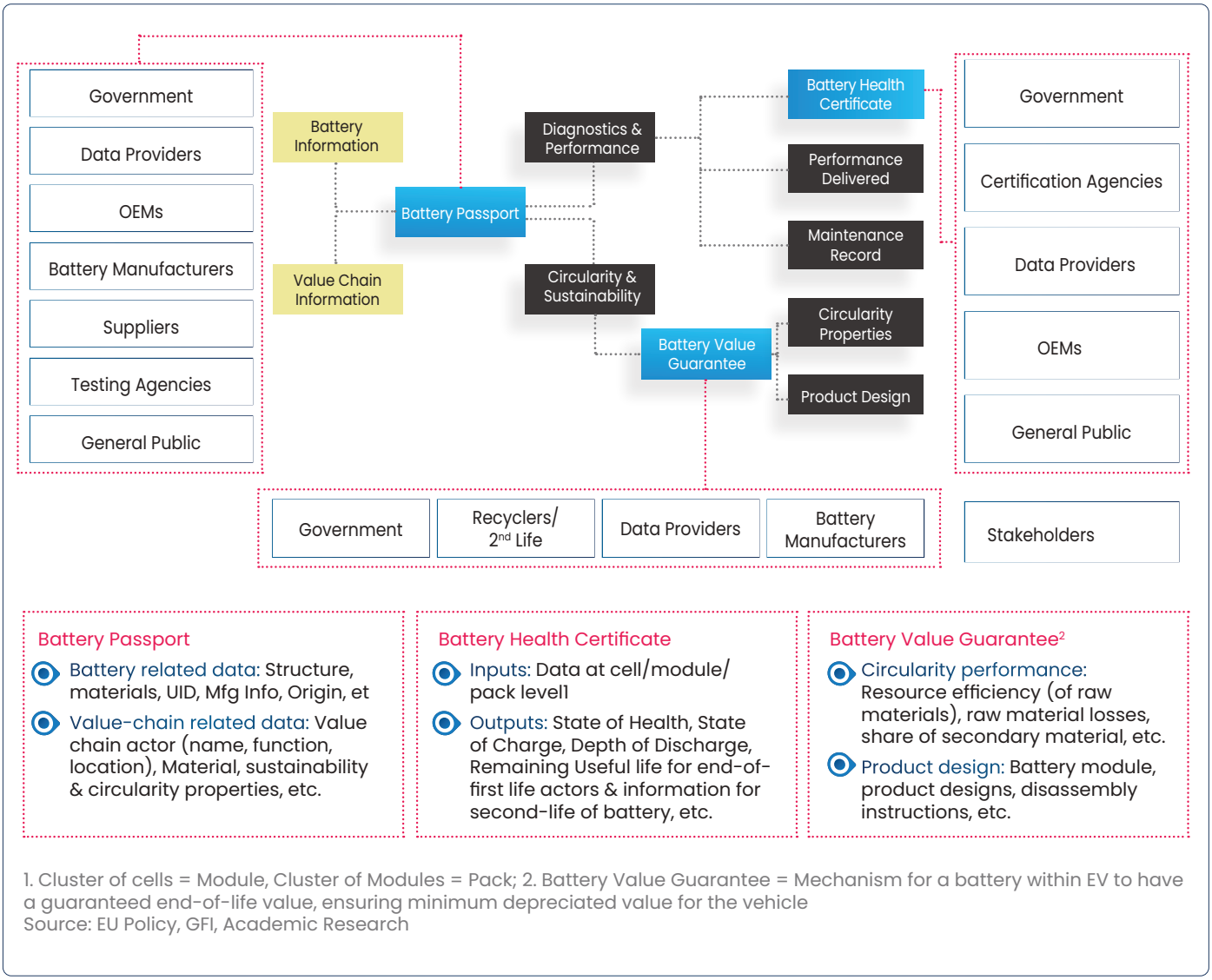
iii. Battery Passport initiative in Europe

The Global Battery Alliance (GBA) is public-private collaboration platform founded at the World Economic Forum to help establish a sustainable battery value chain by 2030. The overarching goal of the alliance is to establish a circular battery value chain and develop mechanisms necessary for the same.

Battery passport[25] is one initiative under the GBA which proposes a unique ID for each battery. The unique ID will act as a digital signature containing data about ESG performance, manufacturing history and usage pattern. The battery passport platform will allow stakeholders to share information about battery and its history to trace battery health and end-use applicability. Its key features include recommendations to users based on up-to-date information to extend first-life of battery, project the future life of the battery along with continuous battery quality assessment, and incorporate patented intrusion detection devices to hinder people from manipulating data.

The proposal for Waste Battery Regulations in 2020[24] includes making Battery Passport or similar unique identifier essential for all EV batteries. The Passport will be a centralized data system open to 3rd party use set up by European Commission. The Economic Operator placing batteries on market (e.g., OEMs) responsible for accuracy, completeness and up-to-date data included in the Passport and updating status in case of repair or re-purposing. The proposal also includes a directive on mandating BMS for all EV batteries with data on relevant parameters for determining state of health and expected lifetime. Access to data to be provided to person who purchased battery and any third party acting on their behalf to assess residual value, capability for future use, facilitate reuse, repurpose or remanufacturing of battery.

These initiatives (i-iii) in conjunction are aimed at reducing uncertainty surrounding EV battery technology and facilitating creation of a circular economy for batteries in Europe. Battery certification is aimed at creating a framework for ensuring safety and guaranteeing a minimum level of performance while recycling and second life use cases help in estimating the salvage value of batteries. Both these initiatives are enabled by the Battery Passport that facilitates data sharing to track battery health and ensures traceability.



1. Cluster of cells = Module, Cluster of Modules = Pack; 2. Battery Value Guarantee = Mechanism for a battery within EV to have a guaranteed end-of-life value, ensuring minimum depreciated value for the vehicle
Source: EU Policy, GFI, Academic Research

Exhibit 3.13: Battery passport network providing end-to-end information on the battery

13. CREATION OF SECONDARY MARKET FOR USED EVs

Entities Involved	Governments across Europe, USA
Geography	Europe, USA
Levers Addressed	Reduce risk of product resale

In the Europe and USA, to kickstart creation of a secondary market for used EVs governments are offering subsidies in the form of one-time grants or rebates. Used EVs offer an affordable way for customers to shift to EVs and hence governments are providing incentives to stimulate demand for used EVs along with subsidies on new vehicles. Select examples of government programs[26,27] are presented in the exhibit below:

Country	Subsidy for used EVs
	In US, rebates are given by state governments. In California, depending on area of residence, rebates between $1,500-$4,000 available for used EVs. For e.g., LADWP offers up to $1,500 for 2-8 years old EVs
	Subsidy of €2,000 available for used BEVs with an original price between € 12,000 - €45,000 and at least 120 km range
	Subsidy of €6,000 for BEV, €4,500 for PHEV, not older than 1 year and driven less than 15,000 km. Minimum holding period for the car is 6 months
	€1,000 one-time grant for private individuals for BEVs and fuel cell electric vehicles, at least 2 years old. The car must be kept for minimum 2 years by new owner

Exhibit 3.14: Used EV subsidy in Europe and USA

Select OEMs have also taken the initiative to build a secondary market for EVs. One such example is Renault[28]. In 2018, Renault launched a long-term leasing arrangement for second-hand Renault ZOE in France with rates starting at 59 euros per month and additional 29 euros for battery rental. The cost of installing charging stations at the buyer's home (up to €500) was also covered by Renault Occasions. To build confidence in the used EV market, all cars had to meet Renault Occasions Garantie Z.E. certification label, passing a 76-point inspection. Additionally, warranty was provided up to 36 months including a free inspection after 1,000 km, along with a road test. Renault also posted a suggested retail price for other dealers selling second-hand EVs - €8,900 for a 3-year-old ZOE Life, 22 kWh battery and <30,000 km on the odometer.

14. GREEN FINANCE INSTITUTE: PLATFORM FOR PUBLIC-PRIVATE COLLABORATION AND MOBILIZATION OF CAPITAL FOR SUSTAINABLE TECHNOLOGIES

Entities Involved	Green Finance Institute
Geography	UK
Levers Addressed	Enable collaboration between different stakeholders and channelize capital towards EV financing

The Green Finance Institute[29] in the UK was established in 2019 as a direct response to a key policy recommendation made by the industry-led Green Finance Taskforce to the UK Government in March 2018. It is an independent and commercially focused organisation backed by government and led by bankers, focused on public and private sector collaboration in green finance. The institute is envisaged to design, develop, and launch portfolios of financial solutions that accelerate sector specific transition to low-carbon future. The coalitions comprise practitioners from the industry, finance, government, academia, and the non-profit sectors who understand the market failures and investment gaps and can co-design innovative financial products.

Green Finance Institute undertakes projects around systematic transitions that need to be financed in the economy, such as energy efficient retrofitting of buildings and decarbonization of road transport. It also undertakes raising of capital to help fund initiatives. One example of a project undertaken by Green Finance Institute is the Local Climate Bond campaign[30]. The campaign was launched in coalition with Abundance Investment, an online investment platform. LCBs are debt instruments issued by Local Authorities to raise money directly from the public. They are regulated investment products launched by Councils to access cost-effective funding for specific de-carbonization projects, offering local people an opportunity to invest in their area in a way similar to crowdfunding and to make a return from doing so. Green Finance Institute helped in raising awareness and support participating councils through the process of releasing their Local Climate Bonds.

Within decarbonization of road transport the key focus areas for the institute are

1. Purchase and leasing - Co-design new and enhance existing financing solutions to encourage increased EV adoption.
2. Charging infrastructure - Link public and private finance to unblock barriers to the creation of a strategic vehicle charging network
3. Battery Technology - Unlock the required capital across the battery technology ecosystem at scale and speed.

The institute has undertaken multiple projects in this space such as EV loan securitization, bundled finance solutions, battery health certificate, battery value guarantee to name a few.

Further, it also regularly publishes thought leadership reports in collaboration with various academias to highlight the various gaps in the investment sector and potential solutions for the same.

As detailed above, there are various stakeholders in the EV ecosystem that are making individual efforts to solve for challenges faced for EV financing today. In the next section, based on learnings from best practices observed across the globe, a detailed set of initiatives is proposed under the 5 key thrust areas that will help further the penetration of EV financing in India.

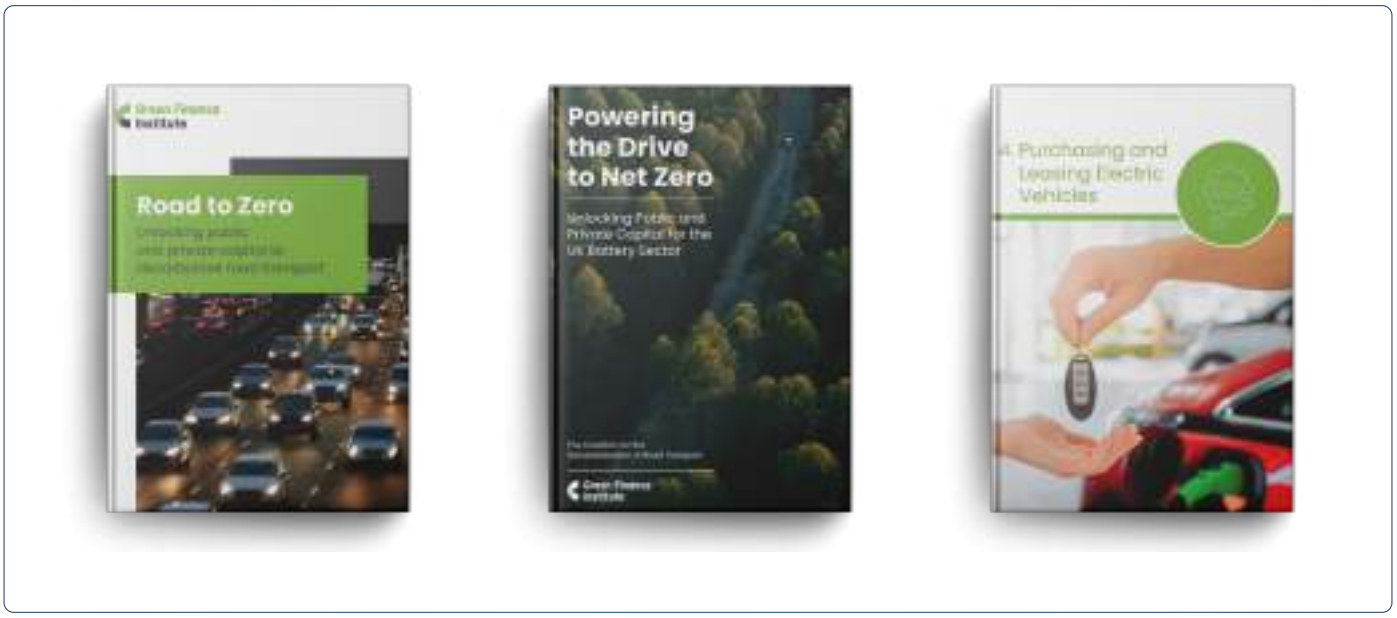


Exhibit 3.15: Thought leadership by Green Finance Institute

04

Potential solutions to drive affordable financing for EV

Based on exhaustive analysis of the challenges faced in financing EVs, and understanding some of the levers used to overcome these challenges with innovative solutions, we have identified 5 key thrust areas to target. These 5 thrust areas have been further detailed into 10 action items (or initiatives) with each item covering the scope and the activity required for the initiative. The key stakeholders critical for success of each of the initiatives, have also been identified.

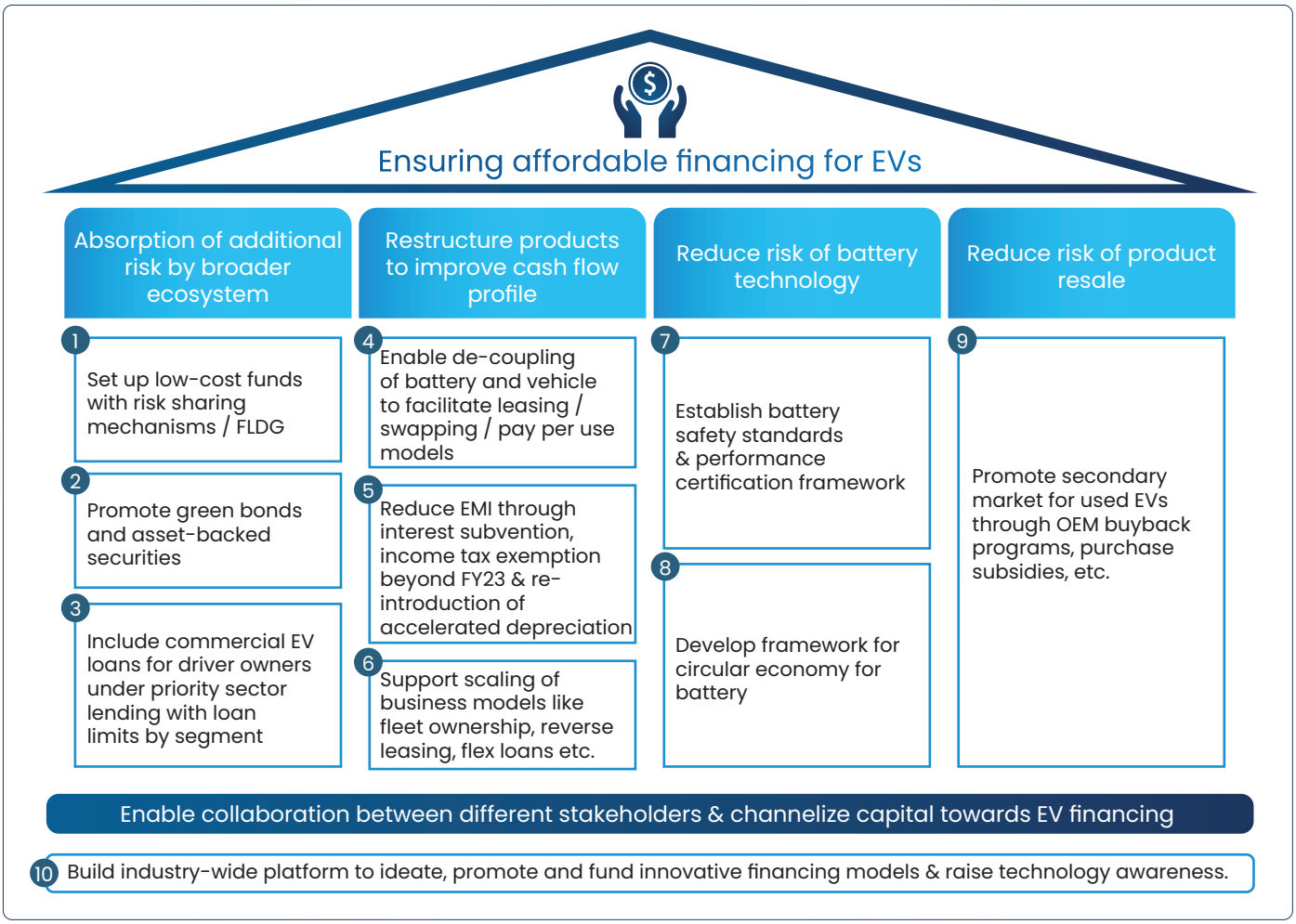


Exhibit 4.1: 10-point action agenda to ensure affordable financing for EVs in India

Thrust Area 1 - Enable the broader ecosystem to absorb the additional risk in EV financing to bring down the cost of borrowing for end customers

I. Context

Currently, EV financing faces multiple challenges across vehicle categories given the nascency of the electric mobility ecosystem in India. Further, due to concerns around technology and long-term economics (including resale value), FIs perceive that financing an EV vehicle has additional risks over ICE. Thus, to limit their exposure, FIs pass this risk to end-consumers which ultimately results in higher cost of borrowing. This challenge could be potentially addressed by structuring mechanisms that can enable the larger ecosystem to absorb some of the inherent risk and/or provide FIs access to lower cost capital (below their usual rate of borrowing) specifically for lending in the EV sector. Some mechanisms through which this can be done have been proposed below.

II. Proposed initiatives (Action 1 to 3)

#1 – Establish low-cost funds with risk sharing mechanisms / first loss default guarantee

Stakeholders involved: Financial Institutions, Government, OEMs

Access to low-cost capital can be facilitated through creation of a risk-sharing facility like a loan loss reserve to cover general default or loss due to specific risks, for e.g., product failure. The reserve can be created at the behest of the government and structured to include multiple stakeholders across the EV ecosystem.

There are multiple ways such a risk sharing mechanism can be structured with multiple options for providing funding. These include grants, risk underwriting, debt, equity, debt and equity with first loss guarantee, and fund innovative start-ups through a funding platform. Some possible structures basis example seen in the last chapter could be:

i. Financing through equity with first loss default guarantee (FLDG)

- MDBs/funds/private partners can come together as equity participants either directly or through pooled SPV to create a platform incubated by a Government entity (eg. IREDA, NABARD etc) or an SPV, which will in turn lend out for EV purchases.
- Post proof of concept, this SPV could raise additional capital from lenders (national/ international banks) to create a large pool of capital to lend out to market.
- The MDBs can become the first loss guarantors with a particular threshold of their equity contribution earmarked for NPAs, while the lenders earn a pre-agreed rate of return.

ii. Financing through a debt structure consisting of subordinate debt and credit enhancing terms such as longer tenures

- MDBs / government backed funds / FIs can come together to form a platform of subordinate lenders with higher returns, who can absorb NPAs (up to a particular threshold)
- This mechanism can help mobilize and scale financing products initially.
- Post scale, additional capital can be raised from local/ international banks, who become senior lenders with assured lower returns.

In addition to the above examples a mix of grants with equity and debt can also be used to create a risk sharing mechanism. An FI or the government can also take up the role of a guarantor for some NBFCs with innovative financing solutions, thereby improving the credit rating of the NBFC and helping raise more capital at lower cost.

An illustrative mechanism of how the structuring of low-cost funding with risk-sharing mechanisms can work is shown in Exhibit 4.2. A funding platform can be incubated by a government entity or national bank to provide low-cost funding with risk-sharing facility to banks and NBFCs lending in the EV space. The platform can be funded through a mix of equity, debt and grant through different types of investors like multilaterals, bilaterals, green funds, impact investment funds and philanthropic funds. The risk-sharing facility on the other hand can be funded through equity, grants and/or subordinate debt from these investors.

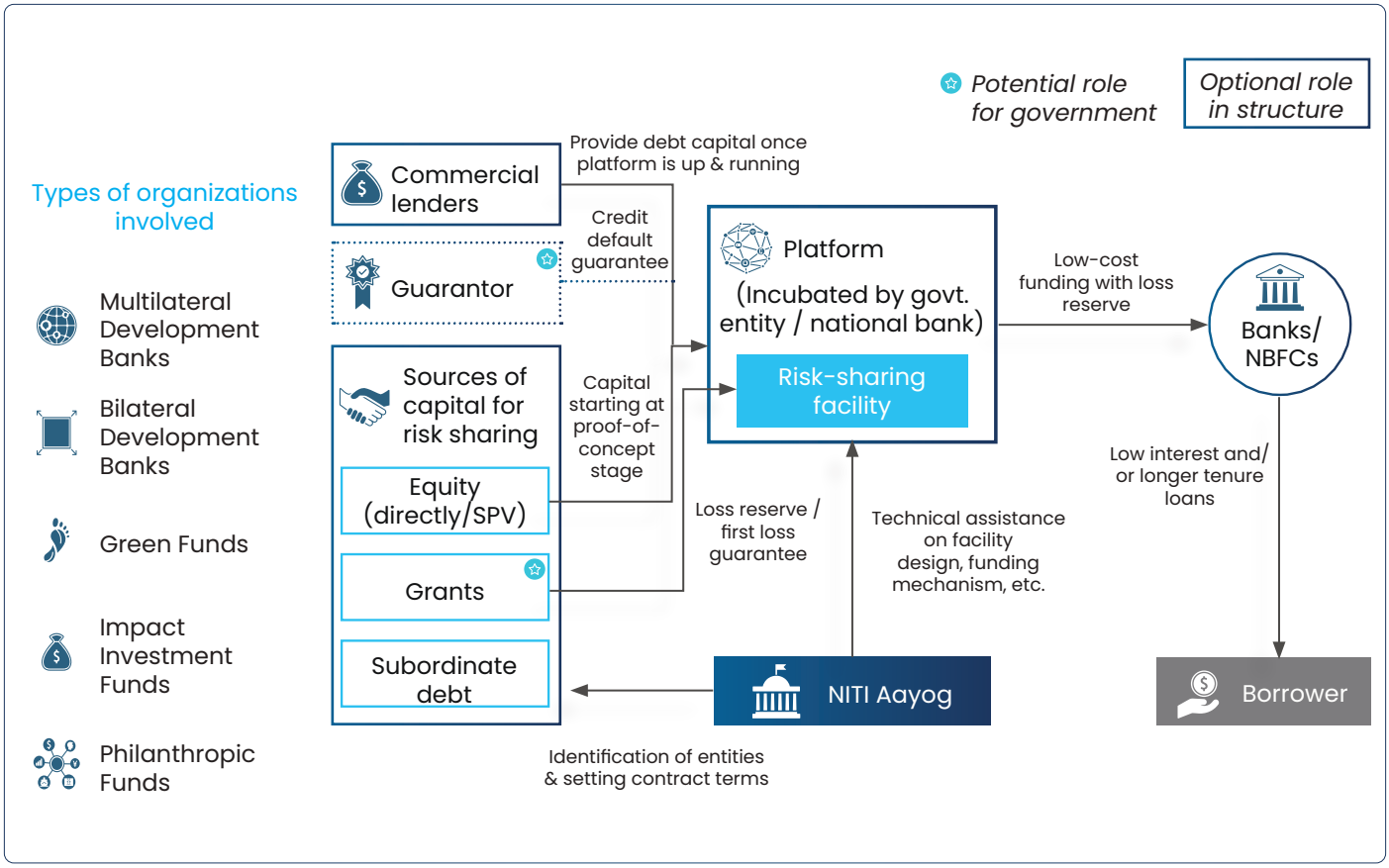


Exhibit 4.2: Proposed mechanism for risk-sharing facility

The government, along with FIs and MDBs can explore some of these structures to mobilize significant amount of nascent institutional capital to accelerate financing for EVs in India. To be able to achieve this, NITI Aayog can assist in defining key objectives of the fund, identifying the funding institutes, government agencies and lending partners and providing inputs on funding structure an governance mechanisms.

#2 - Promote green bonds and asset-backed securities

Stakeholders involved: Financial Institutions | Government | OEMs

Green bonds have emerged as an innovative financial instrument in the last decade. In May 2017, India issued the Disclosure Requirements for Issuance and Listing of Green Debt Securities31 drafted by the Securities Exchange Board of India (SEBI). The regulation includes a list of broad project and asset categories for eligible use of proceeds. However, additional government support is required for proliferation of green bonds as a financing instrument in India.

Taxonomy and definitions: Regulatory support is required to create a coherent and comprehensive taxonomy and definitions for green bonds. This is essential to remove inconsistencies in the interpretation of what constitutes a green bond and prevent greenwashing of projects. Further, the establishment of proper standards can enhance the comparability of bonds. Based on taxonomies defined internationally like the EU Taxonomy and EU Green Bond Standards (EUGBS), Climate Bond Standards (CBS) issued by the Climate Bond Initiative, a holistic taxonomy needs to be created for India covering the following:

i. Complete list of sectors under each category specified by SEBI

ii. Detailed technical criteria for eligibility for classification of project as 'green' for each sector listed above. The criteria need to be set specific to Indian context, considering the maturity of the sector in the country.

iii. Definition of overarching environmental objectives. For a project to be eligible, it should contribute to one or more of these objectives and do no significant harm to any other objective. For e.g., The EU Taxonomy lays out 6 objectives which include climate change mitigation, climate change adaptation, the sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control and protection & restoration of biodiversity and ecosystem.

Governance: A governance mechanism also needs to be set up to conduct stringent periodic assessments to ensure 'green bonds' criteria is being fulfilled, thereby improving legitimacy. While current measures set norms for disclosing allocation of proceeds from green bonds along with assessing environmental impact of the projects, it is essential to ensure external review of the projects, pre-issuance and post-issuance, to provide added credence to the instruments being traded. In the pre-issuance stage, all prospective issues must be verified by a 3rd party to ascertain whether the bonds meet required green credentials. Post-issuance as well, projects undertaken by the issuer, allocation of proceeds for these projects, and holistic assessment of environmental impact should be carried out by a 3rd party reviewer like Climate Bonds Initiative. To ensure transparency and accountability, the 3rd party reviewers' market also needs to be regulated by SEBI. Only registered reviewers who are under ongoing supervision by SEBI can be allowed to review and certify green bonds in India. In addition, penalties can also be levied for noncompliance with the green use of proceeds to ensure the issuance of green bonds remains invested in green projects throughout the life of the investment.

Reducing cost of bonds: Cost of financing has been high due to structural issues like poor financial health of issuers, currency fluctuation due to volatility of rupee and perceived risks due to lack of governance, standards, and certifications. To bring down the cost of borrowing, standards and certifications detailed above are essential which will help in reducing the issuance cost that gets priced into the bond. Another potential intervention could be provision of competitive credit enhancement products to drive down risk associated with green bonds and improve credit rating. National banks and financial institutions like IREDA can develop credit enhancement products like credit guarantees and partial credit enhancements. FIs can also help in reducing the foreign exchange hedging costs through development of low-cost currency hedging products. Funding for these credit enhancement and hedging products can be secured through international DFIs like Green Climate Fund. The Reserve Bank of India (RBI) can also facilitate external commercial borrowing through rupee denominated bonds to help reduce cost of borrowing for green bonds.

Incentives: In addition to this, government support can also be given in the form of tax incentives for retail investors, inclusion of green mobility fund for CSR investments, and/or coverage of additional issuance costs (green certification) for issuers. Currently, a blanket tax deduction of up to Rs. 20,000/- per year under Section 80CCF of the Income Tax Act 1961 for certain notified long-term infrastructure bonds is available. However, in most cases, the tax incentive has been provided to GB issuances only by Municipal Bodies, Development Finance Institutions or Public Sector Undertakings. To open up retail investor participation, tax deductions can be introduced for corporate green bonds as well. Tax incentives can also be given in the form of the following instruments:

i. Tax credits / Direct subsidy bonds – Bond investors receive tax credits / cash rebates instead of interest payments on green bond issuance (e.g., Clean Renewable Energy Bonds (CREBs) and Qualified Energy Conservation Bonds (QECBs) program in the US, where 70% of the coupon from the municipal is provided as tax credit or subsidy to the bondholder)

ii. Tax-exempt bonds – Bondholders are exempted from income tax on interest from the green bonds. Example of such bonds can be seen in Brazil where bond issuance for financing wind projects is exempt from taxes.

On the other hand, a green bond grants scheme like Singapore can also be adopted to incentivize issuers. For instance, Singapore provides a grant of $100,000 or 100% of the eligible expense per qualifying issuance and covers costs incurred in respect of the independent external review or rating done pre-issuance & post-issuance up to 3 years or tenure of bond, whichever is earlier.

A proposed structure of how green bonds will work in the context of India is presented below. The green bond or asset backed securities issuer will need to work with multiple stakeholders across the system, like SEBI, 3rd party reviewers and credit rating agencies as underwriters to finance a portfolio of green projects across sectors. The government's role will be to support the system through providing adequate standards and certification and incentivizing investors & issuers to help in proliferation of green bonds.

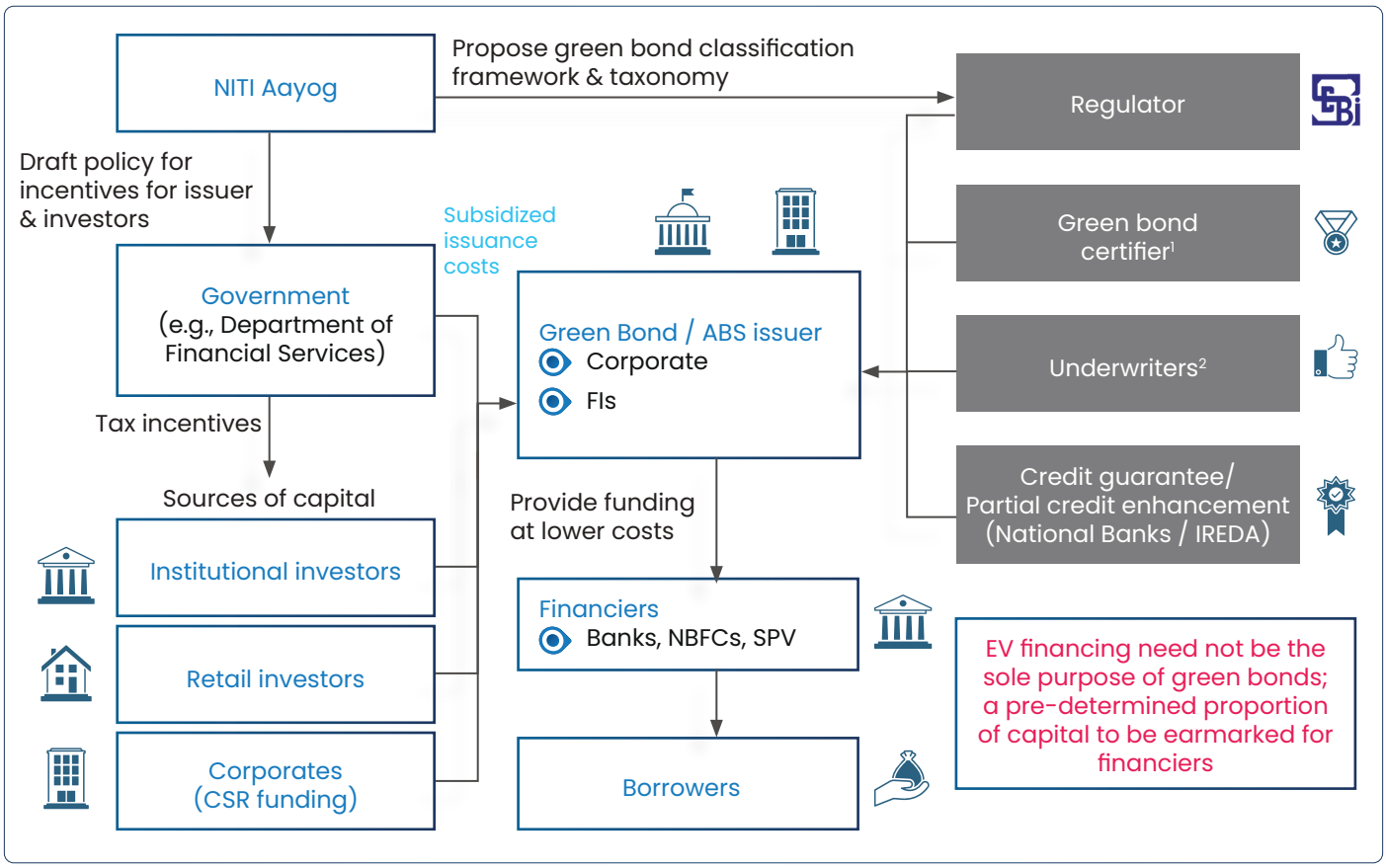


Exhibit 4.3: Illustrative model for green bonds in India

MDBs can also support green bonds through identification/creation of funds with a green portfolio consisting of multiple green objectives like solar, wind etc in addition to EV financing. This will help cover concentration risk. The portfolio can have e-mobility allocation or "greenium" for e-mobility target funds. The overall economic cost of raising green bonds can be evaluated further basis rating of the issuer, tenure, and type of bond, secured or unsecured, and larger macro-economic conditions like inflation/ interest rates.

#3 - Include commercial EV loans under priority sector lending

Stakeholders involved: Financial Institutions **Government** OEMs

Priority sector lending has traditionally been an instrument to enable better credit penetration in credit deficient areas. The aim is to improve lending to the low-income sections as well as allied sectors that need credit boost, which otherwise have difficulty in availing credit. Inarguably, EVs require a similar type of support for specific segments and use cases and hence, a targeted priority sector lending policy could be beneficial.

The inclusion of EV loans under priority sector lending with internal lending limits for Driver cum Owner commercial applications/fleets can be considered. Stipulations can also be detailed for various parameters, for e.g.,

- Loan sizes can be defined by segment and applications
- Lending limits can be defined for individual owners vs fleet operators
- Eligibility criteria for the loans can be laid out basis income / demographic markers

A priority sector lending mandate will help in increasing financing options for the end customer and reduce the cost of borrowing due to the entry of banks in the segment through 3 different models, direct lending to EV customers, co-lending with NBFCs and on-lending model with NBFCs, as shown below:

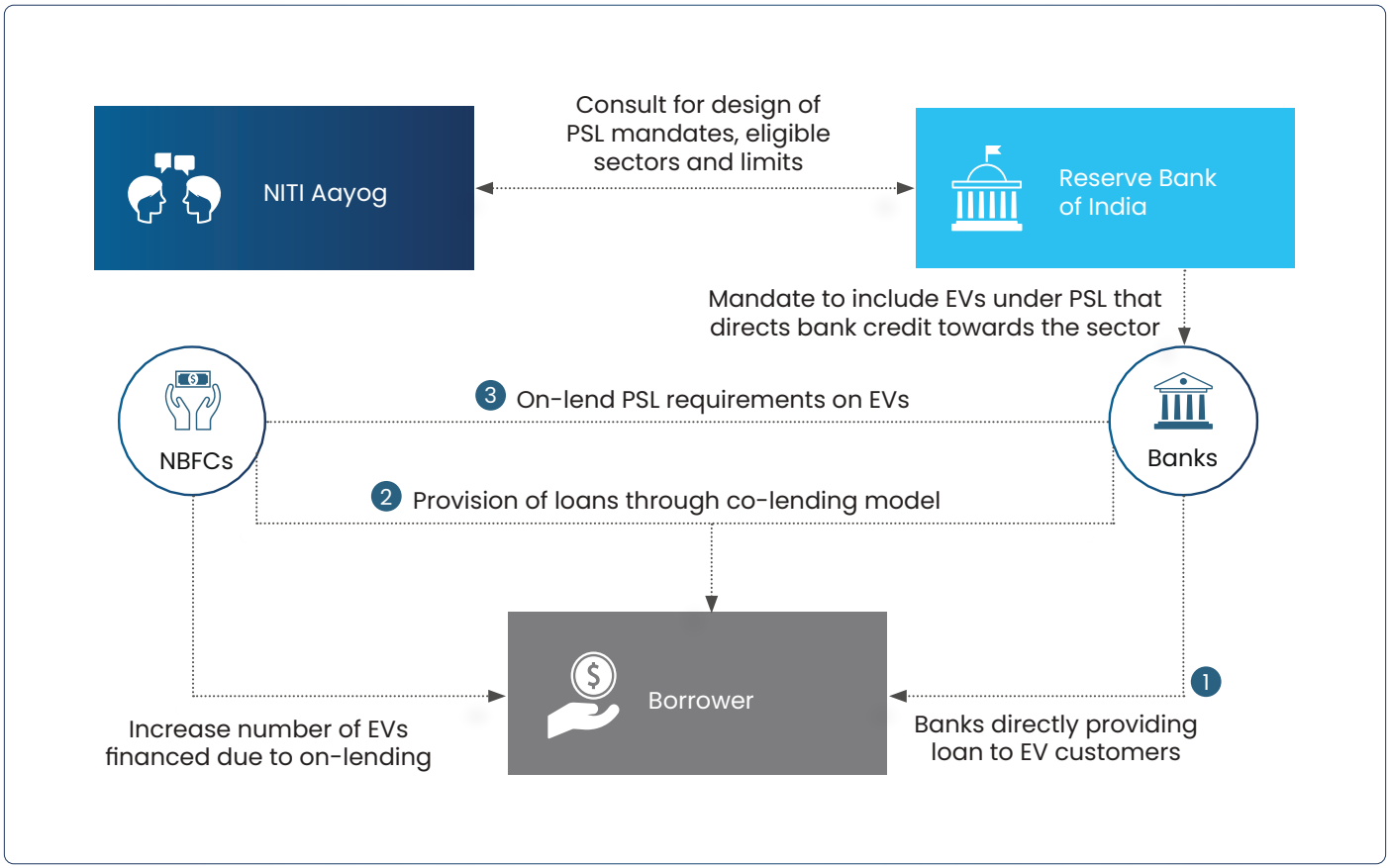


Exhibit 4.4: Illustrative model for priority sector lending for EVs

To ensure maximum impact of this initiative, PSL can be introduced along with other initiatives which reduce product risk, such as extended product warranties. This will help increase the bank's confidence in EVs and help them offer attractive loan terms.

Thrust Area 2 - Restructure financial products to help mitigate challenges such as higher down payment or EMIs through innovative models that can potentially improve cash flows for end customers

I. Context

Loan terms for EVs are starkly unfavorable, especially in the 2W and 3W categories, which make up a majority of the EV market in the country today. Lower LTV and tenure paired with higher rates of interest have increased both the upfront capex required for purchasing EVs and the EMI to be serviced by the customers. Depending on the vehicle segment, the down payment can increase by up to 20% while EMIs can reach up to 1.5-1.8x of those for comparable ICE vehicles. The potential for higher income vs these rising costs, however, remains contingent on the usage of vehicle and supporting operational ecosystem like access to charging stations. In addition to this, in the 3W category, EVs also have a recurring capex structure across the vehicle's lifecycle due to the need for battery replacement every 4-5 years. This further increases the financial burden on the customers. Hence, innovative financial products that can mitigate some of the challenges faced by both financiers as well as customers are required.

II. Proposed initiatives (Action 4 to 6)

#4 Facilitate de-coupling of battery and vehicle to enable leasing / swapping/ pay per use models

Stakeholders involved: Financial Institutions | **Government** | OEMs

Currently, the battery cost comprises majority of the cost of the vehicle and is, therefore, one of the key drivers for higher down payment and higher EMIs. De-coupling the battery from the vehicle provides financiers an opportunity to factor risks for battery and vehicle separately and the customers an opportunity to incur expenses for the battery as per usage – essentially making the cost profile similar to ICE vehicles wherein fuel costs are directly proportional to the usage of the vehicle. In addition, models like battery leasing can be made possible thus transferring the risk of maintenance of the battery from the owner to the lessor. An example of how the business model works for de-coupled battery and vehicle financing in the case of battery swapping is shown below.

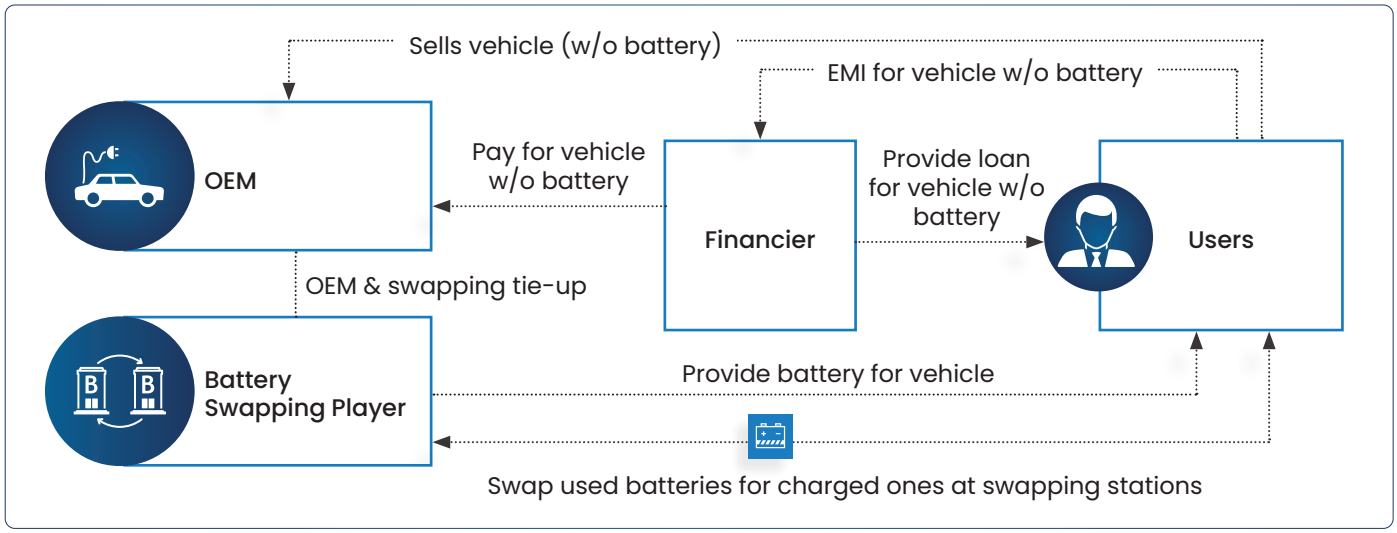


Exhibit 4.5: Illustrative model for de-coupling vehicle & battery financing

However, support will be required from the government to facilitate sale of vehicle and battery separately. Additional initiatives that can potentially be explored are as follows:

- Detailing of Regional Transport Office (RTO) procedures at state level to facilitate easy registration
- Financial support for purchase subsidies for vehicles sold without battery to stimulate demand, either under an existing framework (for e.g., FAME-2) or a new policy
- Detailing of financial incentives for battery manufacturers and battery swapping station (BSS) operators (for e.g., quantum of subsidies and multiplier effect (as BSS have higher battery to EV ratio))

#5 Reduce EMI burden for customers through subvention schemes and tax exemptions

Stakeholders involved: **Financial Institutions** | **Government** | **OEMs**

Subvention schemes can be designed to offset a portion of the customer's interest burden by enabling other players in the ecosystem to absorb a part of the interest burden. A well-designed scheme paired with extended warranties and product buy-backs can be

instrumental in helping build confidence on the product in the financing ecosystem and contributing to the growth of the EV industry.

The government can offer direct interest subvention schemes to EV customers. The scheme can be operationalized through a common platform, run by a government entity, for e.g., Convergence Energy service Ltd (CESL). The platform will serve as an intermediary for all stakeholders - OEMs, financiers and customers. Registered models from OEMs which are leigible for subvention will be present on the platform along with quotes for loans from empaneled banks and NBFCs on each loan. Customers can access the platform to place an order for eligible EVs and receive loans at the lowest interest rate basis their profile. The subvention will be provided by the government directly to the financiers. The incentives can also be paired with conditions on extended warranty / buyback guarantees by OEMs, for e.g., interest subvention to be offered only on EVs with warranty greater than 5 years or a buyback guarantee of at least a set minimum % of upfront price of vehicle after specified number of years.

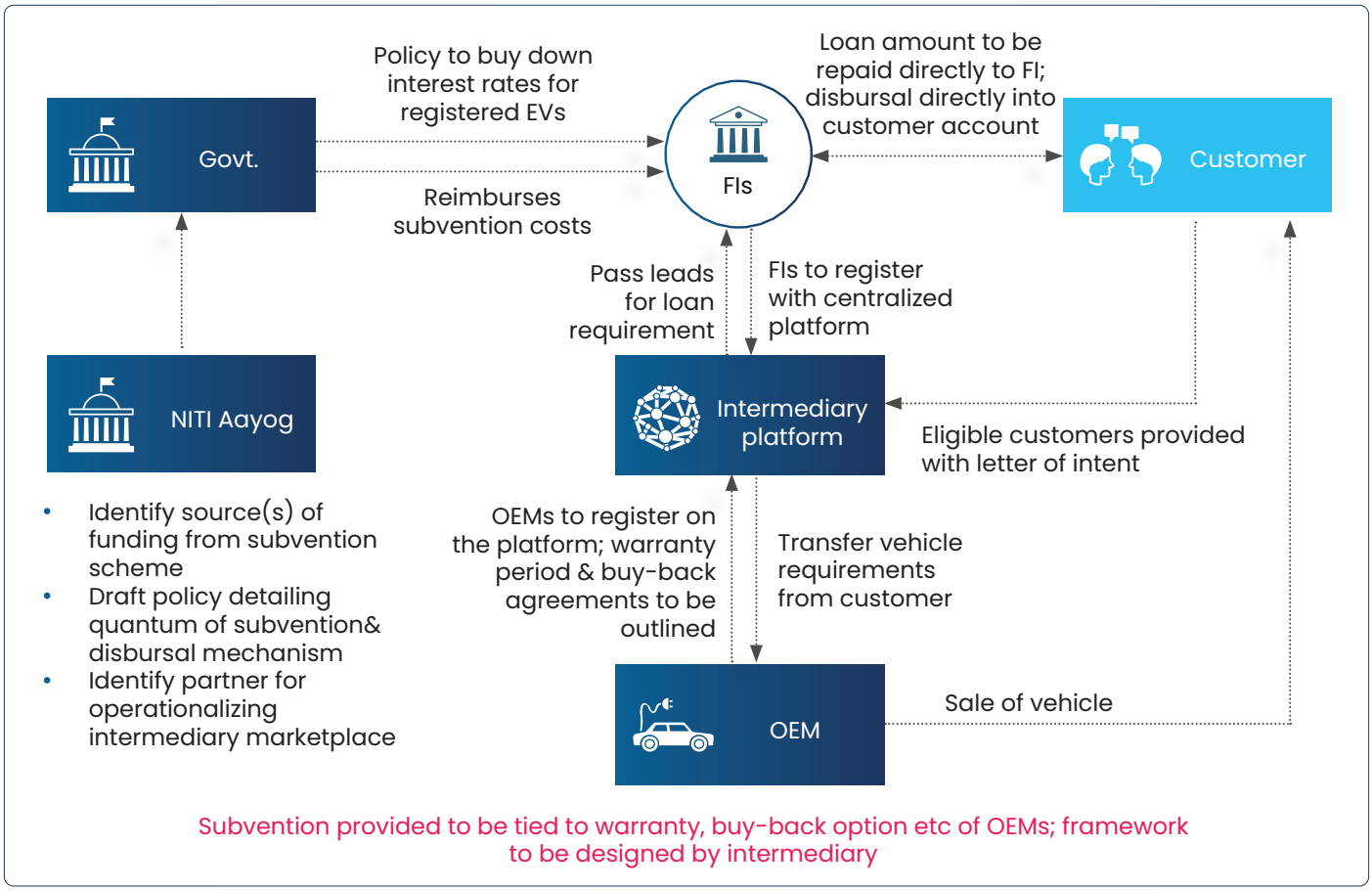


Exhibit 4.6: Illustrative model for government-led interest subvention scheme

Interest subvention schemes can also be led by MDBs or other 3rd parties. MDBs can partner with banks / NBFCs to provide EV loans mandating certain subvention vs ICE loans similar to CEFC's partnerships in Australia. OEM led subvention schemes can also be designed wherein the OEMS help offer subvention schemes through dealers coupled with a loss fund to cover for NPAs / product losses. However, such schemes will have to be initiated by the OEMs rather than being pushed through regulatory measures.

The government can also look at reducing EMI burden through tax exemptions by extending the current tax benefits under 80EEB to loans sanctioned beyond FY23[33]. A tiered exemption structure could be provided by battery capacity or vehicle price. In addition, the government could reintroduce accelerated depreciation for EVs purchased by an organization for commercial purposes, using loans from financial institutions. This would help offset the interest cost burden for EVs in commercial applications and provide further impetus for adoption.

#6 Provide support for the scaling of business models like fleet ownership, reverse leasing, flexible loan structures, etc.

Stakeholders involved: **Financial Institutions** | Government | OEMs

Financial entities, especially startups, providing innovative solutions like fleet ownership, reverse leasing, flexible loan structures, etc., for EV financing require access to capital to scale up operations and reach a wider audience. Banks, MDBs, and other DFIs can help mobilize low-cost funding for such entities by setting an asset financing structure which is front-ended by the financial entity themselves. The financial entity will be responsible for operationalizing the asset finance company, disseminating funds, and absorbing the credit risk. Banking and financial institutions, on the other hand, can act only as investors and will have no exposure to the credit risk, thereby helping them protect their returns.

Thrust Area 3 – Reduce the risk of battery technology by addressing the uncertainty around battery performance and developing a secondary market for used batteries

I. Context:

Batteries can comprise 30-40% of the overall vehicle cost in EVs. Along with the high financial value, the battery is also the key component on which vehicle performance is dependent. A major concern for FIs considering EV loans is battery degradation during the loan tenure. Given the nascency of the technology, FIs currently have no mechanism to understand how battery health and consequently vehicle performance will change during the product lifecycle. This has direct impact on the customer's ability to pay, especially in the commercial sector where the vehicle serves as the key source of income for customers. In addition to this, the secondary market for used batteries is also currently not developed, thereby raising concerns around the salvage value of the asset in case of NPAs.

II. Proposed initiatives (Action 7 and 8)

#7 Establish battery safety standards and performance certification framework

Stakeholders involved: Financial Institutions | **Government** | OEMs

A holistic battery technology roadmap/policy is needed to address risks associated with battery technology. The objective is to create a certification mechanism that will boost financier confidence on battery performance and traceability. To build this framework, collaboration is required between EV OEMs, players along battery value chain, and 3rd party testing agencies to cover all aspects related to certification, traceability and data sharing. Some of the key topics the framework should cover include:

- Classification guidelines for EV batteries
- Battery labelling and information requirements along with unique ID for traceability
- Regulation for EV batteries to contain a smart BMS along with a framework for storing and sharing the information and data needed to determine the state of health and expected lifetime of batteries
- Guidelines around a centralized data system and data sharing norms capturing:
  - Which data to be captured by whom throughout the life of the battery
  - Access to data to assess residual value, capability for future use, facilitate reuse, repurpose or remanufacturing of battery

For battery certification, the framework needs to focus on rigorous enforcement of standards such as AIS-156[34] and AIS-038 (Rev 2)[35]. Enforcement of these norms is needed to ensure compliance by OEMs since at present, OEMs still have a choice to adhere to the previous AIS-048 standard. In addition, the AIS-156 standard does not cover battery swapping. The standard will have to take into account that swappable batteries will have to be swapped a few thousand times, and that a testing procedure should be established for this.

Standards also need to be developed for testing performance and ageing of batteries (for e.g., testing procedures laid out in IEC 62660-1:2018[23]). These can be implemented as a certification requirement for OEMs to help build a national standard guaranteeing minimum levels of performance.

#8 Develop framework for circular economy for battery

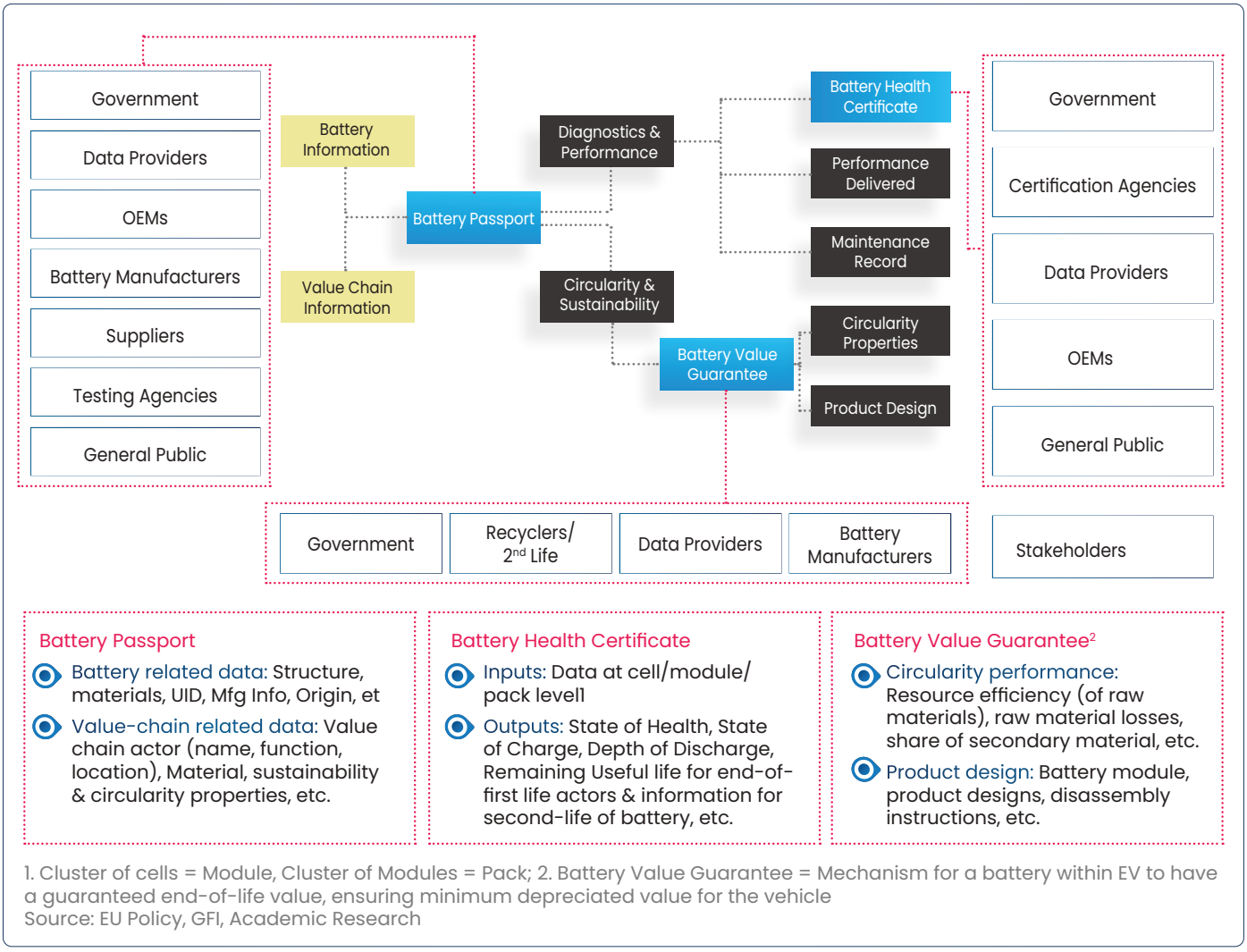
Stakeholders involved: Financial Institutions **Government** OEMs

Development of a circular economy for batteries will help establish a floor price or a salvage value for batteries for their second life/end-of-life scrappage value. This will help financiers estimate the value they can recover from the asset in case of default. To facilitate a circular economy for batteries, battery recycling and end-of-life regulations are required laying down the roadmap across the following parameters for:

- Target recovery rates at material level
- Recycling efficiency
- Target rates for usage of recycled content in new batteries
- Reporting mechanism for battery manufacturers on recycled content used
- Standards on 2nd life use cases

A comprehensive roadmap is needed for the next 8-10 years to act as a guiding direction for R&D efforts for recycling and second life usage and for mobilizing capital needed for commercialization of these solutions. Such a framework will help in increased interest by players in this space leading to the development of a market which can support the resale of batteries, thereby bringing down overall financing costs.

Initiatives #7 and #8 will work in conjunction with each other to form a holistic structure for EV batteries similar to the EU example in Chapter 3 (shown below for reference).



1. Cluster of cells = Module, Cluster of Modules = Pack; 2. Battery Value Guarantee = Mechanism for a battery within EV to have a guaranteed end-of-life value, ensuring minimum depreciated value for the vehicle
Source: EU Policy, GFI, Academic Research

Exhibit 4.7: Battery passport network providing end-to-end information on the battery

Thrust Area 4 - Reduce the risk of product resale by developing a used vehicle market

I. Context

EV adoption has picked up only recently in India. Most vehicles sold to date have not gone through the product lifecycle to enter the used market till now. Hence, the secondary market for EVs currently remains very nascent in India. Globally as well, there are very few markets where used EVs have started to attract customers, for e.g., in the US, EVs comprised ~3% of the used car market sales in 2021. In markets like the US and Europe, multiple stakeholders are working together to facilitate the creation of a secondary market for EVs. Governments in the Netherlands, France, and Germany in Europe and many states in USA are giving purchase subsidies on used EVs while OEMs are also facilitating sales through different models like leasing. A similar push in India could kickstart the creation of a secondary market for EVs in the country.

II. Proposed initiatives

#9 Promote the secondary market for used EVs through purchase subsidies, OEM buyback programs, etc.

Stakeholders involved: Financial Institutions | **Government** | **OEMs**

Purchase incentives for used EVs in the form of one-time grants, tax breaks, etc., can be considered. The subsidies can be provided as an extension to existing policies like FAME-2 or state-level EV subsidies. Based on global benchmarks, conditions for disbursing incentives can be placed on the following to ensure a minimum performance of the vehicle:

- Minimum battery capacity
- Minimum range
- Minimum and maximum year for vehicle manufacturing
- Maximum number of kilometers driven before resale

OEMs on the other hand can be encouraged to design buy-back programs for their own products with back-to-back arrangements with financiers. However, such schemes will have to be initiated by the OEMs rather than being pushed through regulatory measures

Thrust Area 5 - Create a platform to enable collaboration between different stakeholders and channelize capital for EV financing

I. Context

The startup ecosystem has been significant for driving innovations in the EV sector. There are multiple startups in the financing space as well that are providing affordable solutions for EVs. However, due to their limited reach these solutions are only available to a few targeted customers. To enable startups to scale up their solutions, they require access to capital and additional support for operationalization, regulatory changes, etc. On the other hand, financiers still consider EV as a risky sector due to the knowledge gap and limited understanding around technology. It is essential to bridge this information asymmetry through collaboration between OEMs, industry bodies and other players in the EV ecosystem.

II. Proposed initiatives

#10 Build industry-wide platform to ideate, promote innovative financing models & raise awareness on technology

Stakeholders involved: Financial Institutions | Government | OEMs

Creation of a platform for EVs in India can help facilitate flow of knowledge and capital among various players in the EV ecosystem. The platform can draw inspiration from the Green Finance Institute in the UK which acts as a think-tank for EV financing and brings multiple stakeholders like EV OEMs, battery manufacturers, legacy banks and NBFCs, fintechs, MDBs, DFIs, etc., along with representatives from relevant government ministries together under one common umbrella. A similar platform in India, backed by the government, will help in achieving the following objectives:

- Ideate, design, and promote innovative financial models along with relevant stakeholders and undertake projects in this space
- Incubate, roll out, and scale these projects till a certain momentum is achieved
- Help channel private capital across EV ecosystem, especially for EV startups
- Help identify regulatory/process challenges, if any, while implementing projects which need to be addressed
- Leverage the platform to facilitate knowledge exchange between OEMs and financiers on EV technology through initiatives like the creation of a battery technology handbook, collaborations with industry bodies like SIAM to hold conferences, etc.

The proposed initiatives (Actions 1-10) address different risks surrounding the EV ecosystem today. Given the complexity of challenges faced throughout the ecosystem, it is crucial to have a multi-pronged approach with integrated solutions to address barriers across policy, technology, vehicle economics and customer behavior. This requires the government, financial institutions, OEMs and various industry players to collaborate and create holistic solutions to promote affordable financing for EVs. Effective execution of the actions proposed across the 5 key thrust areas can help accelerate penetration of EV financing in India.

4.1 Conclusion and Way Forward

While the previous section detailed out the key thrust areas and the proposed initiatives, the ensuing paragraphs summarize the key activities that need to be focused on to make each of the 5 thrust areas a success.

Thrust Area 1: Enable the broader ecosystem to absorb the additional risk in EV financing to bring down the cost of borrowing for end customers

In order to accelerate adoption of financing in EV's it is vital to structure mechanisms which enable the larger eco-system to absorb some of the inherent risks and enable FIs to extend better loan terms to the customers. The right multilaterals / bilaterals / green funds / impact funds need to be identified through a targeted outreach program showcasing the opportunity in India. The right fund structure needs to be designed along with identified partner(s) to address their risk reward considerations while meeting the intended objectives. Other partners in the structure – government agencies, lenders, equity partners, etc. also need to be identified and onboarded. A mechanism so designed with appropriate risk sharing amongst partners, should be launched for financing EV products in India

Apart from risk sharing mechanisms, mobilizing significant amount of nascent institutional capital into electrification of India's road transport sector is important and can be done through debt instruments like green bonds and asset backed securities. To help in proliferation of these debt instruments for financing EV projects, regulatory support is essential. The current framework for bonds should be benchmarked with other legislations across the globe. Key gaps should be identified (for e.g., in taxonomy, governance etc.) and a holistic framework should be addressed to address these. In addition, if needed, incentive structure can also be designed & rolled out to encourage participation by private investors as well. FIs can also help in proliferation of green bonds through creation of a fund with a green portfolio. Objectives, key focus areas, funding mechanism and type of entities eligible for funding will need to be defined to set up the fund. The project assessment process & other enabling factors like organization structure, governance mechanisms, etc. will also need to be designed along with identifying sources of funding. The right structure for funding will need to be identified to operationalize the fund & initiate disbursement of capital.

It is equally important to improve credit penetration to increase accessibility to financing and help distribute risk over a larger base. Hence, the government can set up an internal working group with Reserve Bank of India (RBI) and other relevant government agencies to consider addition of commercial EV loans in priority sector lending. Eligibility criteria basis income levels, demographic markers and lending limits defined by vehicle segments can be drafted. This will ensure PSL remains an instrument to enable better credit penetration to intended sections of society.

Short Term (4-6) months

Set up low-cost funds with risk sharing mechanisms / FLDG

Government, FIs	Identify and prioritize multilaterals/bilaterals/green funds for investing in India, intiate outreach to showcase India opportunity	
	Design fund structure, define objectives and financing instruments and onboard (Government / local/ international) partners relevant to the structure	
	Work with relevant govt agencies to establish the fund	

Promote green bonds and asset-backed securities

Government	Set up committee comprising all relevant ministries & regulatory bodies (e.g., Ministry of Finance, SEBI, RBI)	
	Benchmark Green Bonds framework and legislation across the globe	
	Baseline current Indian regulations & draft a coherent and comprehensive taxonomy for Green bonds	
	Design incentive structure to promote Green bonds (e.g., Tax incentives)	
	Roll out new green bond norms and incentives	
	Establish periodic review mechanism to ensure adherence to green bonds criteria	
FIs	Initiate creation of fund with a green portfolio	
	Define objectives, key focus sectors, funding mechanism and type of entities to be funded	
	Design project assesment process, organization structure, governance mechanisms, etc.	
	Identify sources of funding and funding structure	
	Operationalize fund and initialize disbursement of funds	

Include commercial EV loans for driver owners under priority sector lending, eligibility and internal lending limits can be defined by segments

Government	Set up internal working group with RBI and other relevant government agencies to draft PSL regulations	
	Define stipulations like internal lending limits, elegibility of borrowers & vehicle categories, etc.	
	Roll-out PSL policy	

Thrust Area 2: Restructure financial products to help mitigate challenges such as higher down payment or EMIs through innovative models that can potentially improve cash flows for end customers

De-coupling vehicle and battery is critical to help financiers factor risks for product and battery separately. This helps financiers structure innovative models such as battery swapping, pay per use, battery leasing, etc. which can reduce upfront down-payment and/or EMI payouts. To facilitate sale of vehicle & battery separately, a coordinated effort is required at the central level to detail registration mechanism for vehicle sold without batteries at state RTO level and ease the process for customers. In addition, incentive structure and disbursal mechanism need to be designed and implemented for vehicles sold without battery, for battery manufacturers and Battery Swapping Station (BSS) operators either under FAME subsidy or a new policy.

Direct interest subvention schemes, by the government or 3rd parties like multilaterals, can also help reduce the EMI burden for customers. To operationalize this through the government, all ongoing schemes in various states should be studied and a holistic scheme should be designed with inputs from other stakeholders like OEMs and FIs. Conditions coupling subvention with extended warranties and buy back schemes can also be included in the scheme. A government agency (like CESL) should be identified and onboarded to create a platform for operationalizing the scheme. Financial institutions like multilateral banks can also offer subvention schemes through partner banks / NBFCs. The right partner banks and/or NBFCs need to be identified and onboarded for the partnership. Funding structure for the partnership and risk-sharing mechanism needs to be designed to roll out the subvention scheme.

Tax breaks too can be considered to help reduce EMI burden of customers. While the government offers tax breaks under 80EEB to individuals who have purchased EVs using loans from financial institutions, the government can look into extending the scheme beyond FY'23. In addition, slabs based on battery capacity or price of the vehicle can be introduced to help targeted segments. While 80EEB helps individual buyers, providing accelerated depreciation for organizations purchasing EVs for commercial purposes using loans from FIs can be considered. Relevant ministries (e.g., Ministry of Finance) need to design the tax breaks and roll them out as part of the budget.

Apart from the above, there are multiple financial entities (new and existing) today experimenting with innovative business models and financial solutions like fleet ownership, flex loans, reverse leasing etc. who need support to scale. Multilaterals / bilaterals / funds should be identified to set up a platform to provide such entities access to capital. The funding structure, governance and process to identify and onboard financial entities should be defined. The entities thus onboarded can operationalize and scale the business idea.

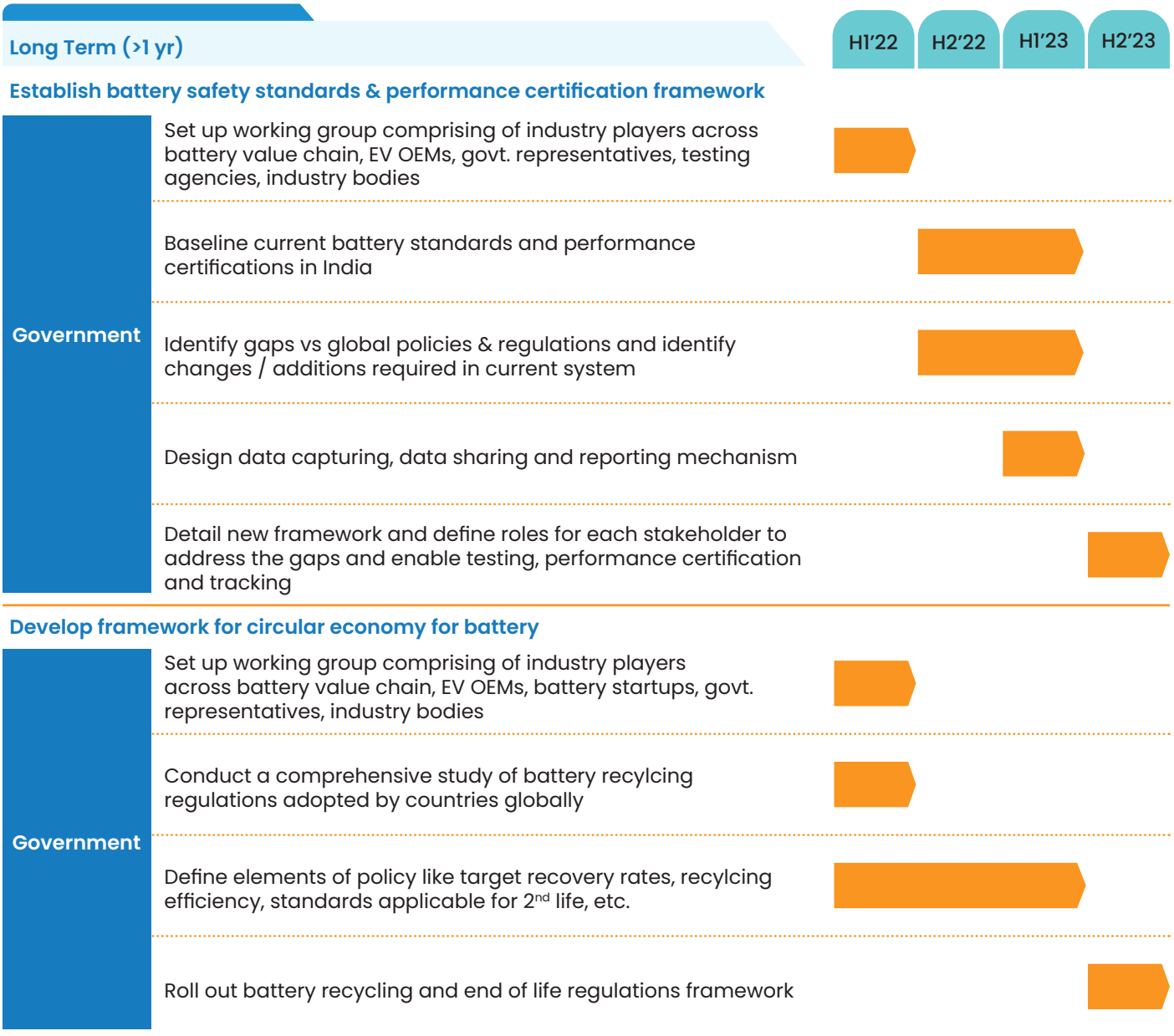
Mid Term (6-12) months

		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Enable de-coupling of battery and vehicle to facilitate leasing / swapping / pay per use models					
Government	Coordinate efforts at central level for operationalizing state RTO procedures, purchase subsidies on vehicle without battery and incentives for battery manufactures & BSS operators				
	Initiate detailing of procedures in collaboration with relevant state governemnt departments				
	Draft incentive structure for demand side, battery OEMs and BSS operators				
	Operationalize relevant procedures and incentive policy				
Reduce EMI burden for customers through subvention schemes and tax exemptions					
Government	Baseline current subvention schemes offered by state governments				
	Work with state govt, agencies and private players to design offering - extent of subsidy by vehicle category, paired with warranty / buy-back				
	Identify & onboard patner (government agency, e.g., CESL) repsonsible for operationalization				
	Set up digital platform for disbursal of incentive				
	Identify and onboard OEM partners & financial institutions to be part of scheme				
	Roll out of subvention schemes				
	Work with relevant ministries (e.g., Ministry of Finance) to design tax exemption and accelerated depriciation offerings				
	Incorporate inputs, finalize new norms and roll out as part of budget				
Reduce EMI burden for customers through subvention schemes and tax exemptions					
FIs	Identify partner banks & NBFCs lending in EV sector				
	Initiate outreach & negotiate details of partnership (e.g., eligible vehicles, eligible buyers, loan terms offered)				
	Desing funding structure and risk-sharing mechanism				
	Roll out subvention schemes through partner banks / NBFCs				
Support scaling of business models like fleet ownership, reverse leasing, flex loans etc.					
FIs	Identify multilaterals / bilaterals for setting up a funding platform to support startups offering products in the EV financing space				
	Define funding structure for the platform, governance and reporting mechanisms				
	Initiate outreach to identified organisations & onboard interested parties				
	Design process to onboard financial entities (for e.g., startups) and operationalise				

Thrust Area 3 – Reduce the risk of battery technology by addressing the uncertainty around battery performance and developing a secondary market for used batteries

To reduce the risk associated with battery performance and boost financier confidence, battery safety standards and a performance certification framework need to be established. To create the framework, a working group comprising industry players across the battery value chain, EV OEMs, representatives from relevant ministries (e.g., Ministry of Heavy Industries), testing agencies, industry bodies, etc. needs to be set up. The working group should baseline existing regulations & standards in India, benchmark with global policies & identify key gaps. The group should form a view on changes required to current policy framework and identify new parameters/topics that the regulation should cover. In addition to this, data capturing, data sharing and reporting mechanism also need to be laid out in this framework. Role of each stakeholder needs to be detailed to address the gaps and enable battery certification and tracking.

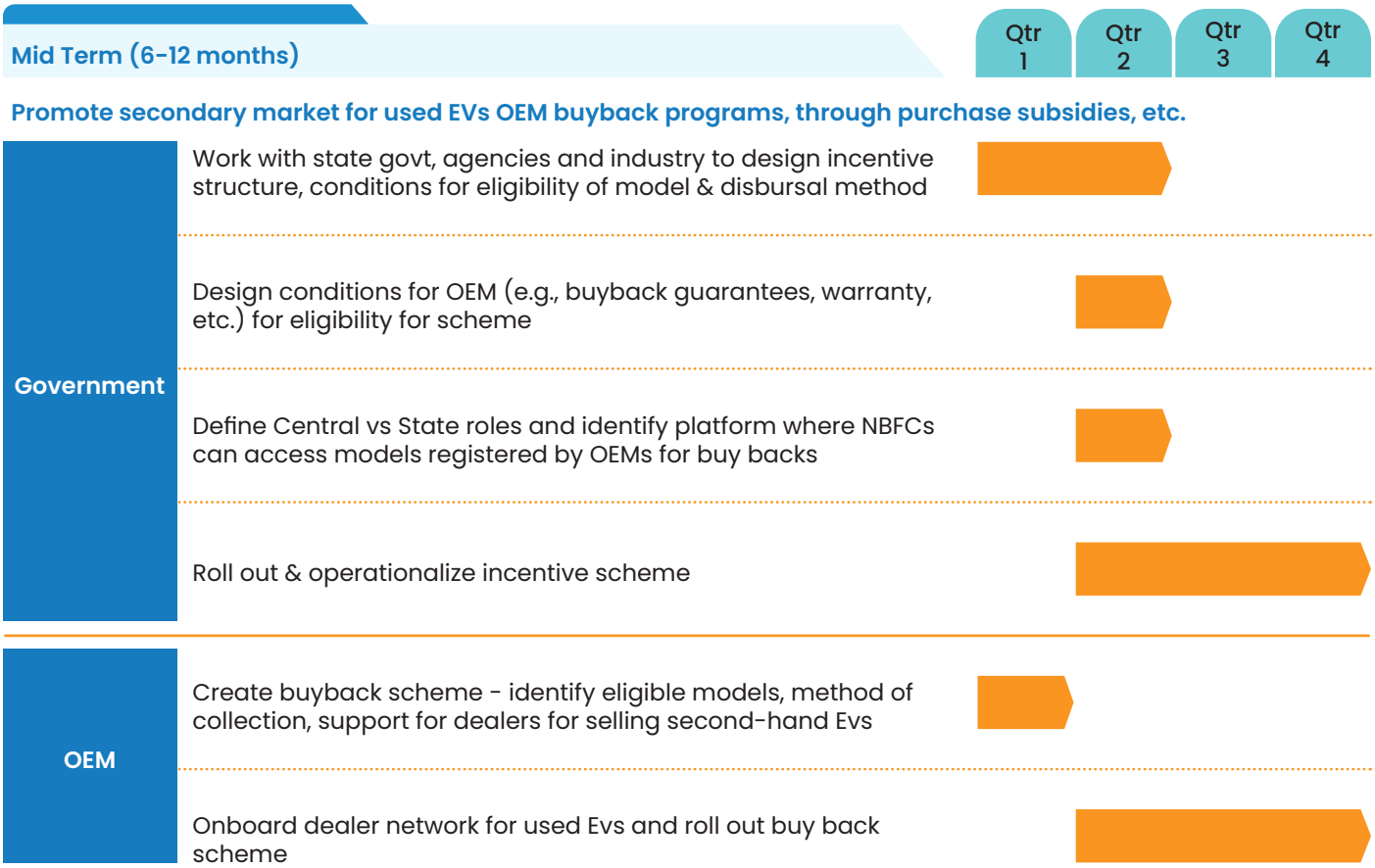
In addition to this, to facilitate development of a circular economy for batteries and establish a floor price/ salvage value, a comprehensive policy needs to be created for battery recycling and second life use cases. The working group comprising of industry and government representatives can also address issues around circular economy. Elements of the policy like target recovery rates, recycling efficiency, standards applicable for second life, use of recycled material in new batteries need to be detailed in line with global benchmarks. The circular economy framework can be a part of the battery safety and performance certification initiatives through a holistic overarching policy for EV batteries.



Thrust Area 4 – Reduce risk of product resale by developing a used vehicle market

Developing a secondary market for used EVs can help assuage a key concern for financiers – value that can be recovered from the asset in case of a default. To help kickstart the demand for used EVs, the government can offer purchase subsidies with schemes on similar lines as those offered for new EVs. Incentive structure and quantum of incentive to be given will need to be designed in tandem with state governments and industry players. Additionally, criteria for eligible vehicles will also need to be detailed (for e.g., conditions on OEM like buyback guarantees, etc. and conditions on models like minimum range, battery capacity, etc.). An existing platform (like CESL) can be leveraged, or a new platform can be created for FIs to be able to access models registered by OEMs for buybacks.

OEMs can also help in developing this secondary ecosystem through targeted buyback schemes for EVs. To operationalize this scheme, OEMs will have to first identify eligible models and then detail the entire process from collection of vehicles to resale. Support to dealers for resale will also need to be detailed. OEMs should then onboard the dealer network for used EVs and roll out the proposed scheme.



Thrust Area 5 - Create platforms to enable collaboration between different stakeholders and channelize capital for EV financing

Current innovation in the EV system is happening in pockets leading to limited capital inflow and exchange of information between stakeholders in the ecosystem. To channelize capital towards EV financing and reduce information asymmetry, industry-wide platforms need to be created with stakeholders across industry, government, and academia. To set up the platforms, the right partners need to be identified and onboarded to create an initial working group with the founding members. The group should then focus on outlining the platform structures, roles, sectoral objectives, key focus areas and outcomes to be achieved. Review mechanisms to assess performance against set objectives also need to be designed. To launch the platforms, key lighthouse projects need to be identified. In addition, processes to develop future project pipeline also need to be established.

Long Term (>1 yr)

H1'22 | H2'22 | H1'23 | H2'23

Build industry-wide platform to ideate, promote and fund innovative financing models & raise technology awareness.

Government	Identify partners consisting of govt agencies, financial services, academia and industry to set up a collaborative platform	
	Onboard initial founding members for the platform across all stakeholders and set up working group	
Government, FIs	Outline platform strucuture, roles, sectoral objectives, key focus areas and outcomes to achieve	
	Design a review mechanism to assess performance against set objectives	
	Identify key lighthouse projects for the platfrom and establish process for developing future project pipeline	
	Launch platform with key lighthouse projects	

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