REPORT

FEBRUARY 2026

Financing Rural EV Transition: Learnings from a Risk-Sharing Facility

ABOUT

The Natural Resources Defense Council (NRDC): With over 50 years of experience, the Natural Resources Defense Council (NRDC) combines the power of more than three million members and online supporters with the expertise of over 700 scientists, lawyers, and policy experts to drive climate and clean energy action, protect nature, and promote healthy people and thriving communities. NRDC works in the United States, China, India, and key geographies to advance environmental solutions. In India, NRDC partners with leading organizations working on issues related to clean energy access, energy efficiency, cooling, climate resilience and clean transportation. For over 15 years, NRDC has also worked with government officials at the national, state, and city levels, partnering with local groups and businesses to combine scientific research and policy acumen to implement impactful climate solutions.

https://www.nrdc.org; Twitter @NRDC

ABOUT SEWA:

The Self Employed Women's Association (SEWA) is the only national trade union in India that exclusively represents the needs of women workers in the informal sector economy. SEWA has a membership reach of 3.2 million across 18 states of India, with strong grassroots penetration in both rural and urban areas. Internationally, SEWA also works with the women workforce in Afghanistan, Nepal, Sri Lanka, and Myanmar. SEWA's work is driven by two primary goals–full employment and self-reliance. While full employment entails guarantee of work, income, food, and social security (healthcare, childcare, nutrition, shelter, and insurance), self-reliance involves empowering members to take decisions individually and collectively on matters of trade, economy, life, and livelihood. SEWA helps organize women into self-owned collectives–self-help groups, producer groups, cooperatives–based on their trades. It provides information, awareness, health services, skills training, and financial support (savings, credit, insurance, pension). It also builds market linkages to help members sustain and scale livelihoods.

Guided by these goals and principles, SEWA has organized its members into 4,813 self-help groups, 160 cooperatives, 15 economic federations, and 3 producer companies.

https://www.sewa.org/; @SEWAComm

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List of Abbreviations

AMU	Accelerated Money for U
E-WEE	Empowering Women and Enhancing their Business through E-Mobility
EMI	Equated monthly installment
EV	Electric vehicle
FDG	Focus group discussion
FY	Financial year
ICE	Internal combustion engine
NBFC	Non-banking financial company
NRDC	Natural Resources Defense Council
OEM	Original equipment manufacturer
RSF	Risk-sharing facility
SEWA	Self-Employed Women's Association
SIDBI	Small Industries Development Bank of India
TVS	Thirukkurungudi Vengaram Sundram

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Introduction

01

Transport infrastructure is a critical driver of economic growth and development. In rural India, mobility plays a crucial role in supporting communities that depend on agriculture and small businesses for their livelihoods.[1] However, existing transport options are often inadequate, unreliable, or poorly connected, limiting access to essential services, opportunities, and resources. These constraints isolate rural communities and restrict the scale of livelihood activities by impeding access to technologies, markets, and other social infrastructure.[2] Providing mobility solutions that are aligned with rural needs and support sustainable economic participation is essential.

Improved rural mobility, including better connectivity to storage and market infrastructure, can significantly enhance productivity and economic output. It can help small and marginal farmers mitigate the risk of losing more than 30 percent of post-harvest produce because of poor storage and transport infrastructure.[3] Reliable access to commercial centres can help rural entrepreneurs, especially women, thrive, as improved mobility increases participation in income-generating activities, contributing to a higher quality of life.[4]

In rural India, beyond private vehicles, buses remain the primary mode of public transportation. Auto-rickshaws sometimes serve as an alternative; however, they are often highly unreliable. For a large share of the rural population, walking or using two-wheelers remains the most common means of commuting.

Rising income levels are changing mobility choices in rural India. Recent survey evidence indicates that 39.6 percent of rural households reported an increase in income over the financial year (FY) 2024-25, while over 76.6 percent reported higher consumption, reflecting enhanced purchasing power and growing asset ownership aspirations.[5] Against this backdrop, rural markets are dominating the two-wheeler market, accounting for nearly 40–50 percent of total sales.[6] In In FY 2024-25, sales of two-wheelers in rural markets in India grew by 8.39 percent, significantly higher than the 6.77 percent growth recorded in urban markets.[7] As urban centers increasingly bear the environmental and public health burden of a growing internal combustion engine (ICE) vehicle fleet, it becomes essential to ensure that rural populations make informed sustainable mobility choices.

Electric vehicles (EVs) present a unique opportunity to bridge emerging mobility gaps while reducing greenhouse gas emissions. EV sales across India exceeded 20 lakh units in FY 2024–25, accounting for 7.49 percent of total vehicle sales, but adoption remains largely concentrated in urban areas; rural markets remain underdeveloped.[8] Given that nearly two-thirds of the total population resides in approximately six lakh villages across rural India, timely interventions are critical to facilitate their integration into the clean mobility transition, both to expand affordable mobility options and to prevent the spillover of older, more polluting ICE vehicles from urban centers into rural areas.[9]

As India seeks to address transportation needs in rural regions, EVs can be leveraged to improve livelihoods, increase household savings through lower operational costs, and advance the country's clean energy and equity goals. With this objective, the Natural Resources Defense Council (NRDC), in collaboration with the Self-Employed Women's Association (SEWA) and the Small Industries Development Bank of India (SIDBI), launched a pioneering EV pilot in January 2024. This pilot was implemented in the villages of Anand district in Gujarat and Dungarpur district in Rajasthan, with viability gap funding provided by SIDBI. Detailed design and implementation aspects of the pilot are discussed later in the report.

This report is a comprehensive account of the rural mobility initiative. In it, we explore mobility patterns in rural contexts, outline barriers to EV adoption, detail financing and ecosystem interventions piloted to address them, delve into the on-the-ground impacts, and identify key lessons for scaling inclusive electric mobility and informing future policy design.

02

Decoding Rural Mobility Patterns and Adoption Barriers

The rural mobility initiative aimed to generate early insights into the adoption and use of electric two-wheelers by rural women. It focused on identifying early adopters well-positioned to integrate electric two-wheelers into their daily mobility and livelihood activities. As part of the pilot, 10 SEWA sisters received electric two-wheelers. They were selected based on their access to reliable clean energy for EV charging, their need to travel long distances regularly, and a demonstrated commitment to using the vehicle to enhance their livelihoods. We also considered the beneficiaries' ability to pay, supported by loans and grants.

Figure 1: Electric Two-Wheeler Vehicle Handover to Early Adopter

Source: NRDC India, February 2024

Learnings from the pilot revealed two major barriers to EV adoption in rural areas. First, there was limited awareness of EV technologies and their benefits and performance. This, in turn, contributed to hesitation and concerns about aspects such as battery safety, product warranties, and the availability of after-sales support in rural areas. Second, the high upfront cost of EVs compared to their ICE counterparts further discouraged adoption. While ICE two-wheelers are generally priced between INR 90,000 and INR 1,00,000, electric two-wheelers often cost around INR 1,00,000–1,50,000, depending on battery size and other features. This cost difference is further compounded by limited access to affordable financing, as conventional market loans often come with high interest rates. In addition, lenders are cautious about extending credit for EVs due to the perceived risks associated with newer technologies. These barriers highlight the urgent need for targeted rural e-mobility initiatives that can improve awareness, foster user confidence, and systematically address financing constraints to enable wider and more inclusive adoption.

Building on this, in January 2025, NRDC conducted awareness programs with over 400 SEWA sisters in the villages of Gujarat and Rajasthan, not only to raise awareness but also to listen to their lived experiences, financing constraints, mobility needs, and challenges. These interactions yielded key insights into the mobility patterns of rural women, which we describe in the following sections.

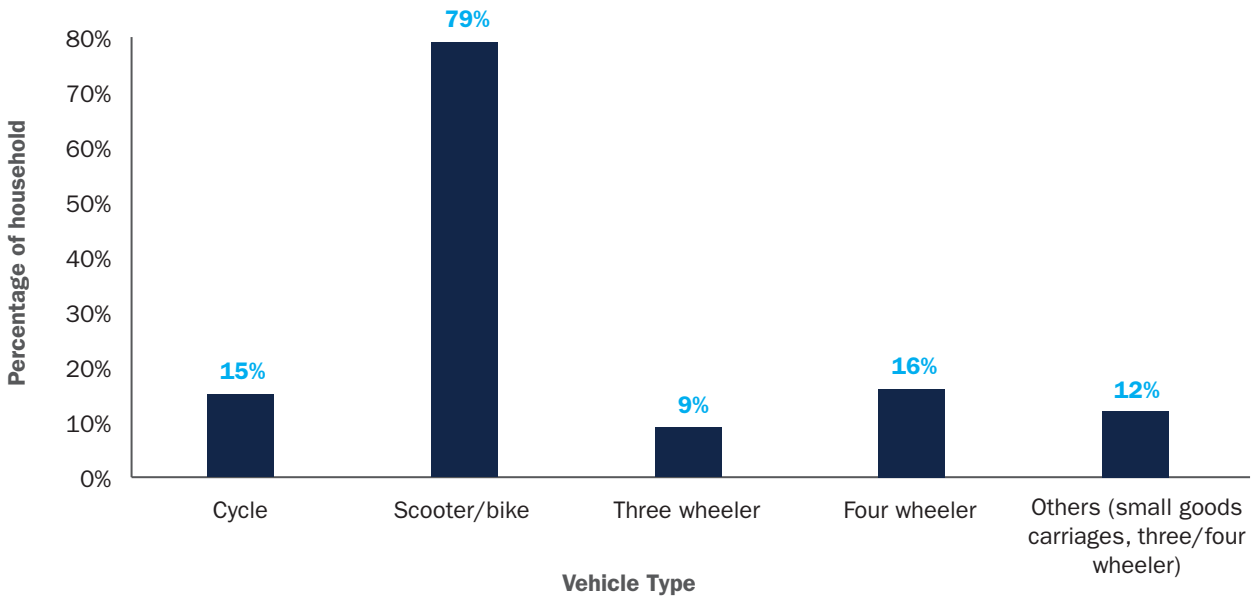
Figure 2: **Discussions during Awareness Program in Gujarat**

Source: NRDC India, January 2025

2.1 Limited Public Transport Access

The primary survey findings revealed that most households own a two-wheeler, suggesting that mobility needs are met through private transport. However, it is important to note that these vehicles are largely used by other family members for livelihood-related activities. As a result, the SEWA sisters often have to rely on limited public and shared transport options for their daily travel of approximately 20 kilometers.

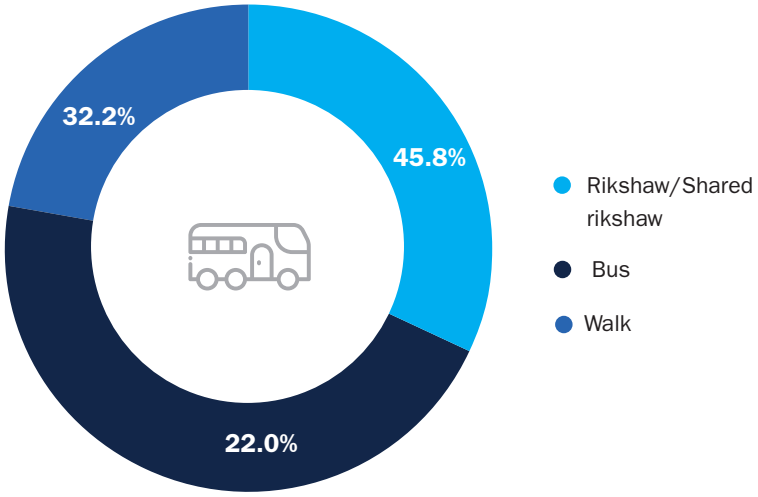
Figure 3: **Existing Household Vehicle Ownership of the SEWA Sisters Surveyed**



Source: NRDC India

As shown below in Figure 4, among public transport options, auto-rickshaws remain the most preferred mode for meeting daily mobility needs. However, they are highly unreliable in terms of frequency and route coverage. As a result, most SEWA sisters rely significantly on walking, while bus use remains limited.

Figure 4: Mode of Commute for the SEWA Sisters Surveyed (Public Transport and Other, excluding Private Vehicles)



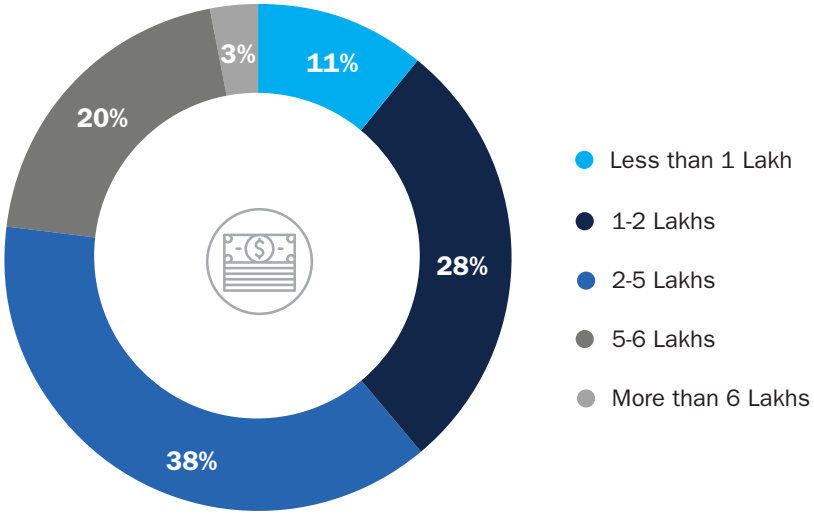
Source: NRDC India

Inadequate public transport exacerbates first- and last-mile connectivity gaps, which not only compromises accessibility but also increases travel cost and time. It is also important to note that these vehicles are predominantly ICE two-wheelers with considerable operational costs. Transitioning to EVs could play a critical role in reducing household expenses and improving livelihood outcomes sustainably.

2.2 Understanding the Cost Burden of Conventional Vehicle Ownership

Owning conventional ICE vehicles puts significant financial burden on rural households. The average annual household income of the SEWA sisters was reported to be approximately INR 2.8 lakhs, reflecting their limited financial flexibility.

Figure 5: Annual Household Income of SEWA Sisters



Source: NRDC India

Limited household incomes, combined with high mobility demands, translate into substantial recurring transport expenditures for SEWA sisters. On average, nearly 25% of annual household income was reported to be spent on fuel and vehicle maintenance alone, excluding other indirect costs. This recurring expenditure on regular travel, combined with limited access to reliable public transport, makes mobility an expensive and often unavoidable necessity.

2.3 Limited Awareness around Electric Vehicles

Rural communities often have no prior experience and familiarity with EV technologies. This raises concerns about battery warranty, range anxiety, and the lack of accessible charging infrastructure. Vehicle dealerships in rural areas also do not offer a range of electric vehicle products due to low demand, limiting exposure among the community. Moreover, insufficient after-sales support and a sparse service network further lower confidence in electric vehicles, making early adopters more cautious.

2.4 What's holding off the Transition to EVs for SEWA sisters

Despite the long-term cost advantages of electric two-wheelers, several interlinked barriers continue to limit their adoption among SEWA sisters. As discussed in earlier sections, a primary constraint is the higher upfront cost of EVs, which is approximately 14% greater than that of comparable ICE vehicles. While many sisters expressed willingness to make a modest upfront payment and finance the remaining cost through loans, access to credit remains a major challenge.

Given the income profile of SEWA sisters, access to market-based financing is largely limited; where available, credit is extended at prohibitively high interest rates. A more affordable financing model (described in section 3.1) could reduce costs by approximately 8% relative to conventional market-based financing. This underscores the need for financing solutions that improve affordability by leveraging patient capital, that allows for reduced upfront payments and extended loan tenures.

Figure 6: SEWA Sisters discussing EV Adoption Challenges

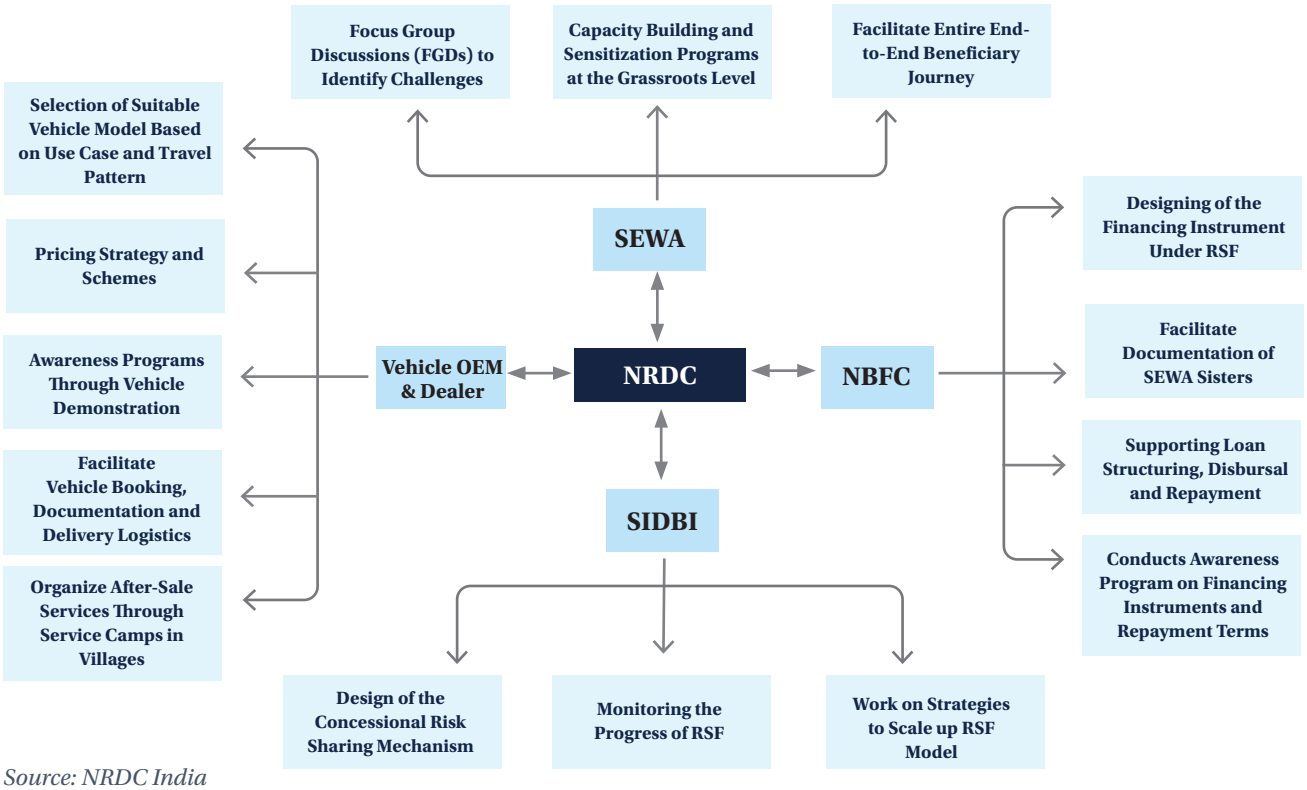
Source: NRDC India

To address the challenges that rural women face when it comes to EV adoption, NRDC and SIDBI jointly launched the EWEE (Empowering Women and Enhancing their Business through E-Mobility) scheme under SIDBI's E-Mobility initiative. This scheme played a crucial role in the pilot by addressing the constraints that affect low-income women's access to clean mobility. The findings from the pilot further underscore the urgent need to demystify electric mobility, spread awareness, and explore financing options designed to reduce financial risks for lenders while easing the upfront cost of EVs.

03 Ecosystem-Level Approach to Advancing E-mobility in Rural India

Building on these insights, the NRDC adopted an ecosystem-level approach, convening key stakeholders—including financial institutions, vehicle manufacturers, and grassroots organizations—to co-develop a scalable and sustainable model to advance rural electric mobility. Grounded in an understanding of rural mobility patterns and livelihood-linked travel needs, the initiative focused on improving awareness and reducing perceived risks. To improve affordability and ease access to credit, financial mechanisms were developed. In addition, strategic partnerships with original equipment manufacturers (OEMs) further supported EV adoption by building trust through product demonstrations and ensuring reliable after-sales support in remote areas. Figure 7 presents this ecosystem-level approach, detailing the roles and contributions of the empanelled stakeholders—SEWA, SIDBI, non-banking financial companies (NBFCs), and vehicle OEMs—and how their coordinated actions shaped the pilot.

Figure 7: Ecosystem-Level Approach for Engagement with Empaneled Stakeholders



Source: NRDC India

In the next sections, we delve deeper into how these elements of the ecosystem-level approach were operationalized.

3.1 Addressing Financing Barriers through a Risk-Sharing Facility

As we discussed in Section 2, evidence from early pilot implementation indicated that higher upfront costs and limited access to affordable financing are constraints for scaling up EV adoption among the SEWA sisters. While interest in electric two-wheelers was strong, the absence of affordable financing and suitable credit mechanisms prevented wider uptake. In response, NRDC collaborated with SIDBI to develop a concessional financing instrument, a risk-sharing facility (RSF), to de-risk lending and enable access to EV finance for low-income women entrepreneurs.

Figure 8: Discussion between Stakeholders to Operationalise RSF

Source: NRDC India

Designing and operationalizing the RSF required identifying appropriate stakeholders across the value chain and developing clear implementation mechanisms. The RSF was operationalized in September 2024 to ensure the technical, financial, and institutional readiness required for rural e-mobility adoption. The following section outlines how this was implemented, including the varied stakeholder roles and the flow of funds, as illustrated in Figure 10.

Step 1: Mobilizing EV resource funds

SIDBI, a development finance institution with a niche in credit, provided initial funds to SEWA under the EWEE scheme through the EV Resource Fund. These funds were utilized by SEWA and earmarked specifically to support the rollout of affordable electric two-wheeler financing for the SEWA sisters.

Step 2: Establishing a revolving corpus

To translate the EV Resource Fund into affordable lending, SEWA pays a concessionary fee to the partnering NBFC, Accelerated Money for U (AMU). The NBFC blends this capital with its own lending resources to enable lower-cost EV loans for the SEWA sisters. The concessionary fee is structured as fully refundable upon successful loan repayment and is returned to SEWA at the end of the loan tenure. Once refunded, this capital forms the revolving corpus, a dedicated pool of funds reused multiple times to support financing for multiple beneficiaries. This blended-finance mechanism enables affordability for borrowers and sustainability of the initiative over time.

Step 3: Partnering with EV OEM

Identifying the right mobility solution and form for the rural context was essential. NRDC engaged with electric two-wheeler manufacturers to select suitable models based on the travel patterns, livelihood activities, and operational requirements of the SEWA sisters. To build consumer trust in the technology and ensure a smooth customer experience, NRDC partnered with Tier 1 OEMs, selected for their established dealer networks, capacity to conduct product demonstrations and awareness drives, and ability to provide reliable after-sales service in remote areas. As part of this effort, the OEMs offered a three-month service pass priced at INR 1,100, translating to approximately INR 360 per service, compared to the average annual servicing cost of around INR 700 per service for ICE vehicles. For the SEWA sisters, this reduced maintenance expenditure lowered unplanned repair

costs during the initial ownership period, thereby strengthening their confidence in EV ownership. Recognizing that trust is a key factor in technology adoption, especially in rural contexts, NRDC worked with the empanelled OEMs to facilitate product demonstrations.

Figure 9: Firsthand Experience of Electric Two-Wheelers by SEWA Sisters in Gujarat

Source: NRDC India

These demonstrations allowed the SEWA sisters to interact with the vehicles and take test rides; special training was given to those without prior driving experience. This not only promoted greater independence among women but also enhanced their ability to access markets more efficiently. In addition, pricing strategies were carefully developed, including features like an extended product warranty to build confidence.

Step 4: Financing and loan repayment

To reduce upfront costs for beneficiaries, we used a financing structure with a gross loan-to-value (LTV) ratio of 85 percent of the on-road price. This means the loan initially covers most of the vehicle cost, easing the financial burden for the SEWA sisters. This structure significantly lowered entry barriers to ownership while maintaining lenders' financial prudence.

The NBFC shortlisted interested SEWA sisters; selected beneficiaries were required to make only a minimal down payment directly to the vehicle OEM, while the NBFC financed the remaining amount. The outstanding balance was repaid by the SEWA sisters through long-term, low-interest EMIs. The loan tenure was structured over 24 months, with the equivalent of three months' EMIs collected upfront as a down payment, which eased the repayment burden and reduced the likelihood of defaults.

As part of its due diligence, the NBFC verified the beneficiaries' financial identities through PAN cards, Aadhaar cards, and bank account details. Creditworthiness was further assessed using Centre for Research in International Finance (CRIF) Bureau checks and verification calls. It also collected key documents, including loan application forms and post-dated cheques, to complete the financing process.

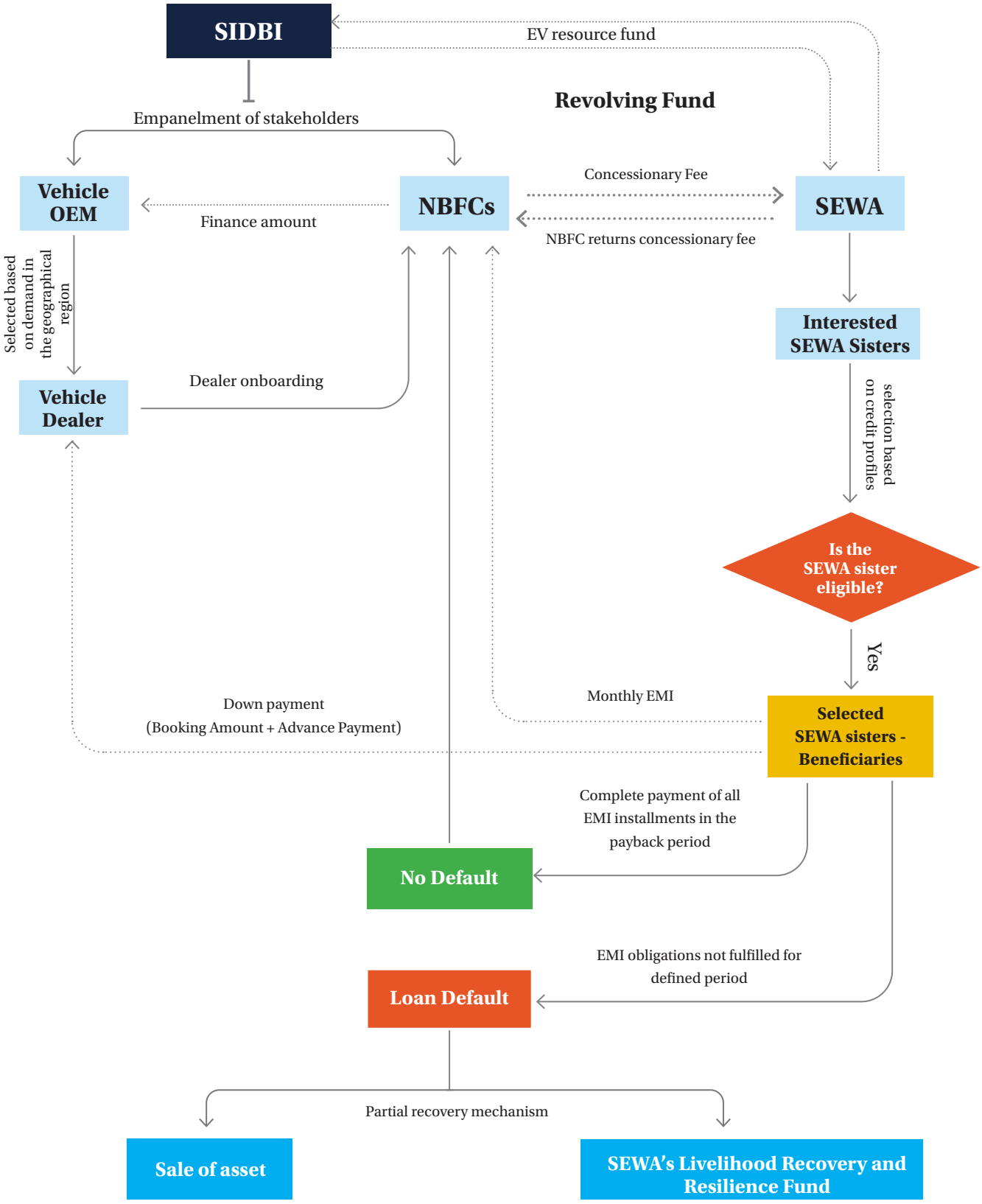
Step 5: Default management, loss recovery, and risk mitigation through loan shield mechanisms

To further strengthen the financing model, structured default management and a loan shield mechanism were incorporated into the RSF. Under a no-default scenario, the SEWA sisters complete EMI repayments within the loan tenure; the NBFC then refunds the concessionary fee to SEWA. This refund allows the capital to be recycled to finance additional beneficiaries, reinforcing the revolving nature of the facility.

In cases where EMI obligations are not fulfilled during the given tenure, the loan is classified as a default, and recovery proceedings are initiated by the NBFC. Recovery is pursued through either the sale of the financed vehicle or through SEWA's Livelihood Recovery and Resilience Fund.

The EV Resource Fund, along with SEWA's Livelihood Fund, helped create a loss-guarantee mechanism. This safety buffer was essential for the RSF, as it guaranteed the recovery of principal amounts in the event of loan defaults, thereby minimizing risk exposure for NBFC and improving the bankability of the rural electric mobility initiative.

Figure 10: The RSF and flow of funds among stakeholders



Source: NRDC India

The RSF provides access to funds with patient capital and low-interest loans for SEWA sisters, offering security for lending partners and laying the foundation for a sustainable, scalable approach to financing electric mobility in rural India. An illustration of how financing for electric two-wheeler works through the RSF is presented in Annexure 1.

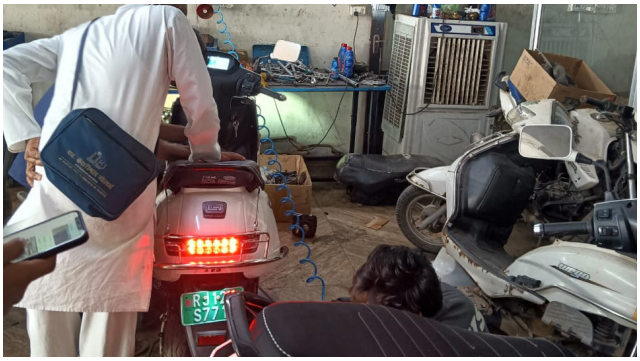
3.2 Building trust through Awareness Drives and After-Sales Support

To foster confidence among early adopters and address the awareness gaps and perceived risks outlined in Section 2, NRDC engaged with the community through practical demonstrations and reliable after-sales support. Recognizing that trust is a key factor in technology adoption, NRDC worked closely with SEWA and electric vehicle OEMs to organize awareness sessions, product demonstrations, and after-sales service camps in villages. The SEWA sisters were educated about the benefits of EV ownership, including their lower operating costs, ease of driving, and how this could translate into improved access to work and economic opportunities. Additionally, they were sensitized about the financing structure through RSF, relevant national and sub-national policies, schemes, and subsidies supporting EV adoption. Awareness sessions were organized across various districts in Gujarat, Rajasthan, Maharashtra, and Uttar Pradesh. These included both physical demonstrations at SEWA offices and virtual sessions for wider participation; details are listed in Annexure 2.

Figure 11: Awareness and Sensitization Sessions in Rajasthan

Source: NRDC India

Figure 12: After-Sales Service Support in Rajasthan



Source: NRDC India

Through coordinated efforts by NRDC, SEWA, SIDBI, and AMU, a total of 95 SEWA sisters successfully adopted electric two-wheelers through this program in 2024–25, marking a significant milestone in advancing rural women's mobility.

Figure 13: EV Handover to SEWA Sisters in Rajasthan

Source: NRDC India

The adoption of electric two-wheelers has not only improved access but also enhanced the mobility, livelihoods, and overall well-being of SEWA sisters, as we discuss in the following sections.

04 Impact of Inclusive EV Finance in Action

Through the rural e-mobility initiative, the ownership and use of electric two-wheelers have led to tangible improvements in the lives of SEWA sisters, with measurable benefits across environmental, economic, and social dimensions. Based on the feedback and usage patterns of the SEWA sisters, we observed the following impacts.

4.1 Environmental Impact

Electric two-wheelers have significantly reduced tailpipe emissions. By replacing traditional ICE vehicles in rural households, these cleaner alternatives support broader climate and sustainability goals. As disclosed by vehicle OEMs, CO_2 emissions from comparable ICE two-wheelers range from 0.035 kilograms of CO_2 per kilometer to 0.04 kilograms of CO_2 per kilometer. With electric two-wheelers, the SEWA sisters collectively travelled a total of 4.75 lakh kilometers during January 2024–January 2026, resulting in a cumulative reduction of 16.62 tons of CO_2 emissions compared to an ICE two-wheeler over similar distances.

4.2 Economic Impact

The introduction of electric two-wheelers for SEWA sisters has been a financially transformative shift, substantially lowering the cost of daily transportation. Given the limited availability of reliable public transport and first- and last-mile gaps discussed in Section 2.1, access to personal electric two-wheelers directly translated into time and cost savings and improved livelihood outcomes. Before transitioning to electric mobility, women reported high monthly expenses for vehicle operation and maintenance, which placed a considerable financial strain on household budgets. For women whose livelihoods depend on daily travel, such as vendors, service providers, or community workers, these recurring costs posed a persistent economic burden.

Asset Ownership and Saving

"With my EV, I can carry up to 60 kilogram of agricultural produce from one village to another, which has enhanced my livelihood income. Earlier, we would often get late to work while waiting for transport. Now, with my EV, I drop my children off at school and reach work on time. The vehicle helps me carry more in one trip, so I don't have to go back and forth. It saves both time and money, and overall, it has improved the quality of my life."

- Meenaben, resident of Gataka village

Financial Independence and Enhanced Livelihood

"Since last year, I have been using an electric two-wheeler. Before that, I used an Activa and spent INR 200 on fuel every day. With the EV, I've saved INR 25,000 in a year. I can carry more material to the market and run my dairy business better. I used to lose INR 30–40 a day, but now I deliver to more places and make a profit. Even at the age of 44, despite family challenges, I learnt to ride a two-wheeler. Today, I feel independent, healthier, and more confident, and I encourage other women to opt for electric two-wheelers too."

- Kailashkuwar, resident of Udaipur village

After transitioning to an electric two-wheeler, it is estimated that SEWA sisters accrued average annual savings of around INR 13,000, as their travel costs reduced by 40 percent compared to using a conventional ICE vehicle. As we highlighted in Section 2, fuel and maintenance costs for ICE vehicles consumed nearly a quarter of annual household income, making the observed post-EV savings particularly significant. These economic gains were made possible primarily through the RSF mechanism described in Section 3, which enabled the SEWA sisters to access financing for electric two-wheelers through simplified documentation and relaxed CIBIL requirements, in contrast to market-based financing. The RSF, along with its provision of low-interest loans, played a pivotal role in enhancing affordability, resulting in an overall cost for an electric two-wheeler that was approximately 8 percent lower than under a conventional financing option. This reduces the vehicle payback period to 3 months, compared to nearly 17 months without these financial interventions. Following the September 2025 GST reform, which reduced the tax rate on sub-350 cubic capacity two-wheelers from 28 percent to 18 percent, the upfront price gap between electric two-wheelers and their ICE counterparts narrowed. However, this led the payback period to increase to approximately nine months. This outcome reinforces the continued importance of patient capital and flexible financing mechanisms to offset higher initial costs and sustain EV adoption among low-income rural users.

Time-Saving and Safety

"Waiting for rickshaws used to make me late, and taking lifts from strangers didn't feel safe. Since owning my electric two-wheeler, I'm on time everywhere and no longer have to rely on others. There's no need to stop at petrol pumps anymore, and I feel more secure even when travelling at night. Having my own vehicle has given me the freedom to improve my financial situation and become independent."

- Naina Kuar Rathod, resident of Gamda Bhramniya village

The accelerated payback structure under the RSF-supported financing structure has made electric two-wheelers a more viable investment for rural women, particularly those using them for their livelihoods. This shift has not only enhanced affordability and reduced mobility-related financial stress but also expanded rural women's access to essential social infrastructure, such as education and healthcare, while enabling them to make small-scale investments in their businesses.

4.3 Social Impact

By lowering transport costs and improving connectivity, these vehicles have supported greater economic independence, as reflected in the SEWA women's increased earnings, expanded livelihood opportunities, and improved time management. Overall, the program has enhanced their quality of life while promoting equitable participation by ensuring equal opportunities to lead, own assets, actively engage in decision-making processes, and advocate for the adoption of clean energy through awareness initiatives, thereby fostering inclusive benefits and empowerment.

The experiences of the SEWA sisters, as presented in these narratives, underscore the transformative impact of access to electric two-wheelers on the livelihoods of rural women entrepreneurs. Beyond individual benefits, these improvements have facilitated greater engagement in household and community activities, thereby enhancing overall well-being.

4.4 Insights from Patterns of Electric Two-Wheeler Usage

Since 2024, the SEWA sisters have used their electric two-wheelers extensively for both livelihood and personal purposes. They charged the vehicles multiple times based on trip requirements and the availability of electricity. Usage data shows that the average state of charge at the time of charging is 55 percent, indicating frequent partial charging.[10] On average, SEWA sisters plug in their vehicles about twice a day, often for less than an hour each time. Given their average daily travel of approximately 20 kilometers, compared to a vehicle's range of around 75 kilometers, this charging pattern was shaped by perceived range anxiety and unreliable electricity supply. Repeated multiple short charging sessions, rather than full charging cycles, can degrade battery health and shorten battery lifespan. This may lead to premature battery replacement, increasing the total cost of ownership and associated expenses. These findings highlight the need for accessible, reliable, and well-distributed public charging infrastructure at strategic locations in rural areas to address these behavioural patterns and fully utilize the environmental and economic benefits of electric mobility in rural contexts.

Figure 14: SEWA Sister Charging the Electric Two-Wheeler at Home

Source: NRDC India, November 2025

While these outcomes demonstrate the potential of inclusive electric mobility models to deliver environmental, economic, and social benefits, the pilot also revealed several structural and operational constraints that must be addressed to enable scale. In the next section, we outline the key barriers encountered during implementation and reflect on lessons for future program design.

Barriers to Accelerating EV Adoption in Rural India

05

The rural e-mobility initiative provided valuable insights into the unique barriers that hinder the adoption of EVs in rural India. Through discussions with SIDBI, SEWA, AMU, and vehicle OEMs, NRDC identified several barriers that affected the pace and effectiveness of implementation.

5.1 Higher Down Payment and Shorter Loan Tenure

Under the RSF, the loan is structured for 24 months of EMIs, with 3 months' EMIs required upfront as a down payment, given the instrument's low interest rate. However, SEWA sisters found meeting these payments difficult. Instead, they highlighted the need for more patient financing options, including lower down payment requirements and longer loan tenures that are better aligned with their cash flows and livelihood needs.

5.2 Longer Lead Time in Loan Documentation and Processing

The NBFCs' documentation and loan approval processes for SEWA sisters took longer than anticipated, primarily because of logistical challenges and the limited availability of dedicated NBFC representatives at the ground level. These bottlenecks delayed the completion of formalities and vehicle delivery, including on dates aligned with participants' special occasions and festivals.

5.3 Dynamic Vehicle Pricing and Exclusive Offers

For women in rural areas, purchasing an electric two-wheeler represents a significant household investment and is rarely a quick decision. Beneficiaries require time to assess financial implications and consult with family members. Fluctuations in vehicle costs and changes in plans—such as extended warranties and cashback offers—during this decision-making period can inconvenience and even discourage potential buyers. This underscores the need for cost transparency and lock-in mechanisms at dealerships; price certainty can help build confidence among rural women considering a purchase.

5.4 Perceived Range Anxiety

As evidenced by the charging behaviour patterns discussed in Section 4.4, the SEWA sisters tend to charge their electric vehicles more frequently than necessary, a behaviour driven by perceived range anxiety. In this context, this refers to precautionary charging behaviour where users charge the vehicle before the battery is substantially discharged and without utilizing the full available driving range. This approach may negatively affect long-term battery health of the vehicle. Hence, to dispel common myths and misconceptions about EVs, awareness programs are necessary to educate first-time adopters on efficient vehicle use.

5.5 Limited Options for Vehicles and Financers

The initiative's expansion might be hindered by the limited range of vehicle models available from select OEMs, as the SEWA sisters seek a broader selection to meet their specific needs. Additionally, financing options remain constrained because of low demand aggregation and the limited presence of NBFCs across different geographies. Expanding both vehicle choices and flexible financing mechanisms is crucial to increasing adoption and ensuring that rural women have equitable access to electric mobility.

06

Recommendations for an Inclusive Clean Mobility Transition

The following recommendations are based on the implementation barriers we identified in Section 5. They aim to strengthen the clean mobility transition and ensure the long-term, self-sustaining scalability of EV adoption in rural India.

6.1 Focus Policy Interventions on Integrating Rural India into the Clean Mobility Shift

In India, both national and subnational EV policies have introduced a range of incentives to accelerate EV adoption; however, their benefits have largely not percolated to rural India. Most existing schemes focus on developing e-mobility ecosystem in lighthouse cities and urban or peri-urban clusters. To make the clean mobility transition truly inclusive, policies should introduce dedicated schemes to incentivize EV adoption in rural areas or earmark funds and provisions within existing policies to explicitly address rural mobility needs**.**

- **Embed clean mobility within broader rural development strategies**: By integrating electric mobility initiatives with rural development, programs can simultaneously address transport and livelihood challenges. This approach will not only expand access to clean, affordable mobility solutions but also foster inclusive economic growth, empower women, and build long-term resilience within rural communities.

- **Launch a nationwide campaign for rural electric mobility:** The government could consider launching a nationwide, adoption-focused campaign along the lines of initiatives such as PM Surya Ghar Yojana or the Model Solar Village program, to catalyse the EV transition as part of the vision for *Viksit Bharat*. Such a movement would accelerate awareness and adoption of EVs in rural areas.

The expansion of the electric two-wheeler market in rural India presents a significant opportunity to accelerate overall EV sales, as rural areas account for nearly 40–50 percent of total two-wheeler sales in the country.[vi] Increased adoption of electric two-wheelers in rural markets would generate sustained demand, encouraging OEMs to scale up production, introduce a wider range of models and configurations tailored to diverse consumer needs, and achieve economies of scale. This, in turn, would enhance the price competitiveness of electric two-wheelers relative to ICE vehicles, supporting a faster, more inclusive transition to clean mobility.

6.2 Create Access to Affordable Financing for EVs

- **Provide access to patient capital to address financial uncertainties:** Given the irregular nature of rural incomes, there is a strong need for patient capital that allows for smaller down payments and lower EMIs than those offered by existing loan structures. Such flexible financing models would make EV ownership more accessible and attractive, encouraging more women to invest in clean mobility and strengthening their livelihoods.

- **Leverage unlocking institutional finance for inclusive adoption:** In India, over 75 percent of two-wheelers are purchased through financing, indicating that affordable credit is crucial to accelerating the adoption of electric two-wheelers.[11] Leveraging institutional finance is therefore essential, as the large-scale deployment of clean mobility solutions depends on improved access to affordable and patient capital. Innovative financial instruments—such as concessional loans, credit guarantees, and blended finance—can play a pivotal role in de-risking investments and lowering barriers for consumers and financiers alike. Equitable access to these mechanisms will empower rural women and low-income households to actively participate in the clean mobility transition, making electric two-wheeler adoption more viable, sustainable, and socially inclusive. Government interventions and development finance institutions can play a crucial role in expanding access to affordable financing for electric two-wheelers in rural India.

6.3 Increase EV Adoption among SEWA Sisters

- **Scale and diversify clean mobility across SEWA regions:** Extending strategies beyond electric two-wheelers to include three-wheelers can help create a comprehensive, replicable model for inclusive rural e-mobility. By integrating institutional finance, charging infrastructure, entrepreneurship pathways, and livelihood-linked use cases—such as deploying electric three-wheelers within SEWA-led supply chains, including the Rural Urban Distribution Initiative (RUDI) for agricultural produce distribution—can enhance rural connectivity, generate additional income opportunities for women, and reduce emissions.

Figure 15: SEWA sister experiencing electric three-wheeler

Source: NRDC India May 2024

- **Leverage multiple NBFCs to accelerate financing:.** Engaging different NBFCs based on their geographic presence and loan structures can streamline the vehicle financing process. This can accelerate approvals, shorten file clearance times, and reduce documentation delays, making EV adoption more efficient and accessible for SEWA sisters.

- **Expand vehicle choices through OEM onboarding:** Doing so can help create a broader platform, allowing SEWA sisters to select vehicles that best meet their needs and budgets. The increased variety would not only cater to diverse preferences but also help aggregate demand more effectively, ultimately driving higher adoption of EVs among rural women.

- **Strengthen charging infrastructure and women's entrepreneurship:** Developing accessible and reliable public charging infrastructure is essential to addressing perceived range anxiety and building user confidence. This also presents opportunities for grassroots entrepreneurship, helping create jobs for women and offering community-based charging solutions.

- **Lead targeted awareness campaigns:** These should educate SEWA sisters on optimal charging practices tailored to their travel needs. They can include demonstrations of how to maintain battery health, extend vehicle lifespan, and ensure long-term performance, empowering users to make informed decisions and care for their EVs effectively.

07

Conclusion

The Rural E-Mobility Initiative by NRDC, SEWA, and SIDBI clearly demonstrates how access to electric two-wheelers can empower rural women by reducing transportation costs, improving personal safety, expanding access to social and economic infrastructure, and lowering carbon emissions. Implemented across four Indian states, the program's success was driven by the strong collaboration between SEWA, SIDBI, OEM partners, and financing institutions, with affordable and simplified financing emerging as the most critical enabler for adoption among SEWA sisters. However, high upfront payments and short loan tenures remain key bottlenecks in scaling such initiatives.

To promote the adoption of electric two-wheelers in rural areas, the government could introduce targeted interventions under rural development policies, complemented by supportive national and subnational EV policies. Special provisions to accelerate EV adoption in rural India are critical. At the same time, development finance institutions can play a catalytic role by supporting innovative, flexible, and context-specific financing models tailored to rural use cases.

This approach would not only advance India's electric mobility goals but also help curb the inflow of older, more inefficient, and more polluting ICE vehicles into rural regions, delivering long-term economic, social, and environmental benefits.

Annexure I

Comparative pricing of ICE and EV two-wheelers through market financing and risk-sharing facilities

Parameter	Market financing		RSF
	ICE	EV	EV
On road price (INR)	95,000	1,08,000	1,08,000
Down payment + financing components (INR)	21,500	21,500	21,500
Loan amount (INR)	77,000	90,300	90,300
Tenure (months)	21	21	21
EMI (INR as per market rates and RSF scheme)	4,156	5,045	4,300
Landed cost (INR)	1,08,776	1,27,445	1,11,800
Payback period (months)	-NA-	17	3

Note: -Vehicle models considered for analysis – ICE vehicle: Honda Activa; EV: TVS iQube (prices as of January 2026).
-Estimated Monthly Operational Savings: INR 1,083 (based on an average daily usage of 20 km).
-EMI and Associated Interest: Calculated based on stakeholder consultations and market research

Annexure II

Locations of awareness programs

State	Villages
Rajasthan	Hadmala, Rangthor, Gamda Bhamniya, Ghata Ka Gaon, Kandola, Kheda Kachhwasa, Aasela, Berniya, Modra, Ghatu, Nokna, Bhiluda
Gujarat	Sanand, Chekhla, Radhanpur, Sanoshra (Bhavnagar), Surendranagar, Anand, Aaravali, Mehsana, Chhota Udaipur, Gandhinagar, Kutch
Maharashtra	Aurangabad, Nanded
Uttar Pradesh	Mohanlalganj

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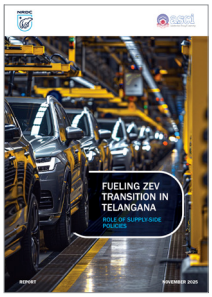
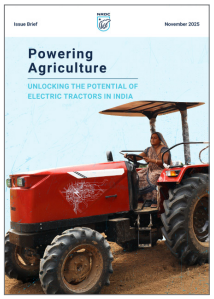
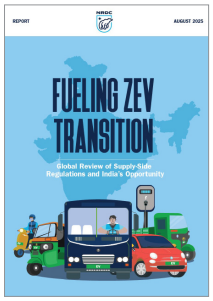
Highlighted Reports



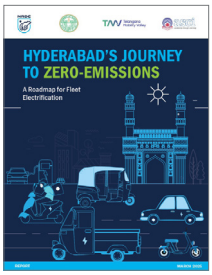
Fueling ZEV Transition in Telangana: Role of Supply-side Policies



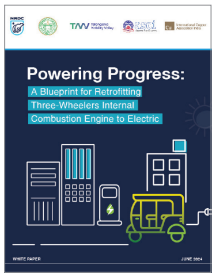
Powering Agriculture: Unlocking the potential of Electric Tractors in India



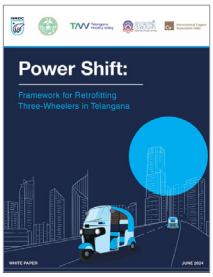
Fueling ZEV Transition: Global Review of Supply-Side Regulations and India's Opportunity



Hyderabad's Journey to Zero-Emissions: A Roadmap for Fleet Electrification



Powering Progress: A Blueprint for Retrofitting Three-Wheelers Internal Combustion Engine to Electric



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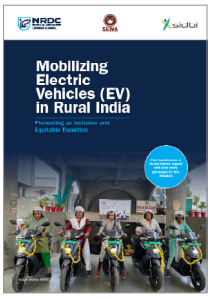

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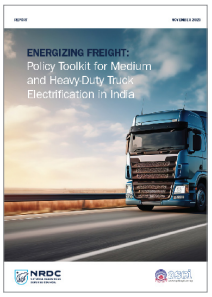

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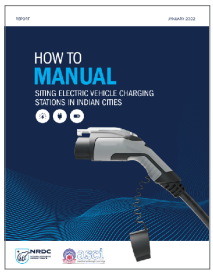

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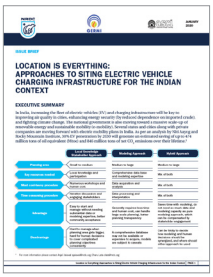
Stakeholder driven solutions for Financing Electric Mobility



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