The EV Opportunity: Unlocking Gender-Inclusivity in India's Mobility Sector

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The EV Opportunity: Unlocking Gender-Inclusivity in India's Mobility Sector

Vasudha Foundation

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Women make almost half of our population

(48.4%)

with a positive trend in gender equality *

Rising FLFPR from 23.3 percent in 2017-18 to

41.7%

in 2023-24 (PLFS survey 2024-25)

43% of India's STEM graduates are women, one of the highest percentages globally

19

National Skill Training Institutes (NSTI) and more than 300 ITIs exclusively for women.***

30%

reservation of seats for women candidates in all ITIs (Govt. & Private) in all courses**

Contrast

Only 2.6% of the unorganized workers in the Automobile and Transportation industry are female (E-shram portal)

On an average, a male industry worker earned 1.6 times more than its woman counterpart (as per ASI)

Only ~15% of the manufacturing workforce is women

* (Census 2011 and World Bank Population data)
** (https://www.pib.gov.in/PressReleasePage.aspx?PRID=2149339)
*** (https://www.pib.gov.in/PressReleasePage.aspx?PRID=2149339)

Executive Summary

The global transition from internal combustion engine (ICE) vehicles to Electric Vehicles (EVs) represents a profound industrial change that holds significant potential to drive gender equality in India. As India pursues its vision of inclusive growth and becoming a developed nation by 2047, strengthening women's equitable economic participation is paramount. This report examines the challenges and opportunities for gender mainstreaming within the EV value chain, drawing on quantitative surveys (Part I) and qualitative case studies (Part II) to propose strategic pathways for an inclusive transition (Part III). Additionally, it presents insights on women's experiences, needs, and challenges related to EV ownership and access in India.

Context and Opportunity

India has seen encouraging progress in female labor force participation, rising from 23.3 percent in 2017–18 to 41.7 percent in 2023–24. However, the historically male-dominated transport and automobile sectors continue to reflect broader gender disparities. For instance, the data of unorganised workers as captured under the E-Shram Portal showcases that out of the registered 8.4 million unorganised workers in the Automobile and Transportation industry, only 0.2 million are females i.e., only 2.6% are female.[1] The EV revolution presents a timely chance to redefine workforce participation, as the sector emphasizes skill-based roles, digital technologies, and automation, making it suitable for a gender-neutral workforce.

Key Findings and Reflections

The study identified critical enablers and persistent barriers for women across the EV ecosystem, categorized using the STEEP framework (Social, Technological, Ecological, Economic, and Political).

1 Source: E-Shram Portal as on 16th October 2025

Opportunities Driven by Technology and Organization

- Technological Shift: Roles in EV manufacturing are perceived as less physically taxing by 86.52 percent of women respondents, facilitating the entry of women new to the automobile sector (82 percent of manufacturing respondents had no prior experience). The ease of operating EVs has also enabled the participation of women in the gig economy; over 95 percent of surveyed women driving partners indicated this was their first instance in the driving profession.
- Supportive Environments: Women's participation relies heavily on support systems. Nearly all women in manufacturing reported supportive family environments (99 percent) and management accommodating domestic responsibilities (~94 percent). Job flexibility (daytime shifts) is highly valued by driving partners (over 93 percent reported being able to manage domestic duties comfortably).

Persistent Barriers Hindering Inclusion

- Social and Safety Barriers: Women in the gig economy face significant social hostility, with over 60 percent reporting incidents from male driving partners and nearly 40 percent reporting harassment from passengers. Safety concerns are paramount, leading 65.12 percent of women driving partners to terminate work by 10 pm, restricting their operational window.
- Infrastructure Gaps: The lack of gender-inclusive public infrastructure presents a major deterrent. Over 60 percent of gig economy driving partners reported difficulty accessing clean and safe public toilet facilities during work hours. For prospective EV owners, safety and convenience at charging stations are critical factors influencing usage.
- Economic and Financial Exclusion: Limited access to formal financing severely restricts women's ownership and entrepreneurial aspirations. Over 86 percent of gig workers reported challenges in financing vehicles, with collateral requirements being a significant hurdle. Further, the high involvement of spouses and parents suggests a persistence of traditional gender roles where purchase decisions for major assets like vehicles are often dominated by male family members or the older generation.

Strategic Pathways

Addressing these structural barriers requires a holistic, multi-pronged strategy across six key domains:

- Individual and Community-Level Interventions: Focus on challenging societal norms, promoting STEM careers among girls, and conducting family sensitization to ensure community support for women entering non-traditional roles.
- Institutional-Level Initiatives: Mandate supportive work environments with clean and hygienic facilities, childcare options, flexible work arrangements, and strong safety protocols (e.g., CCTV, travel tracking) and gender sensitization training.
- Policy-Level Recommendations: Integrate gender considerations into state and national EV policies by providing higher EV purchase and training subsidies for women, setting employment targets for women in the EV sector, and ensuring reserved, safe parking spaces at charging locations.
- Enhancing the Skilling Ecosystem: Offer targeted training programs that go beyond technical skills to include digital, financial, and legal literacy (transformative skills). NAVYA - a joint pilot initiative recently launched by the Ministry of Skill development & Entrepreneurship and Ministry of women and Child Development is a great example where young girls in under-served regions will be trained in non-traditional job roles. The program will deliver demand-driven training in non-traditional and emerging job roles, such as digital marketing, cybersecurity, AI-enabled services, graphic design, drone assembly, CCTV and solar PV installation and at the same time focus on interpersonal skills such as communication, workplace safety and financial literacy. Incentivizing female trainers and ensuring accessible training locations are

crucial for success.

- Financial Inclusion and Support: Develop innovative financial instruments, such as collateral-free loans, and offer flexible repayment schedules (e.g., weekly EMIs) tailored to the income patterns of gig workers.
- Targeted Communication and Awareness: Building a positive discourse to shift mindsets around gender mainstreaming and treat E-mobility transition as a generational reset for the automotive industry.

By implementing targeted interventions across these domains, India's EV transition can serve as a model for gender-responsive industrial transformation, combining sustainability with social equity and unlocking substantial economic and social value.

1

Introduction

Introduction

India's development journey is deeply intertwined with its commitment to inclusive and sustainable growth. As the country advances toward its vision of becoming a developed nation by 2047, gender equality emerges as a central pillar of this transformation. The government's focus on social inclusion, skill development, and equitable economic participation has strengthened the ecosystem that supports women in education, entrepreneurship, and formal employment. Across sectors, there has been a growing recognition that women's empowerment is not only a social imperative but also an economic necessity for achieving sustainable development and long-term prosperity.

In recent years, India has made significant progress in improving women's participation in the workforce. The overall female labour force participation rate increased to 35.9 percent in 2022–23, an encouraging improvement of nearly 14 percentage points compared to 2017–18. This positive momentum reflects the combined impact of government initiatives, corporate inclusion programmes, and evolving social attitudes that are gradually reshaping traditional gender norms. Such developments demonstrate the country's potential to unlock substantial economic and social value through sustained efforts toward gender mainstreaming.

The transport sector, which plays a crucial role in national development and connectivity, reflects the broader gender disparities observed in the labour market. Historically, the sector has been dominated by men, with women underrepresented in most roles, particularly in manufacturing, technical operations, and leadership. Even among on-road driving partners, gender representation remains uneven, underscoring the systemic barriers women continue to face in accessing employment within the mobility ecosystem. Yet, this scenario is changing. With the combined forces of digitalisation, policy support, and skill development initiatives, the sector is beginning to open up new opportunities for women's participation.

The ongoing global transition toward sustainable and low-carbon mobility provides a timely opportunity to accelerate this shift. As the world

seeks solutions to mitigate climate change, the transport sector stands at the centre of the decarbonisation agenda. India's transition from internal combustion engine (ICE) vehicles to electric vehicles (EVs) is not just an environmental imperative. It is a chance to redefine workforce participation, technology development, and social inclusion. The EV revolution is reshaping industry skill requirements, with a growing emphasis on digital technologies, automation, and advanced engineering, areas where women can participate more equitably.

This structural transformation positions the automobile industry as a potential leader in promoting gender-inclusive growth. To harness this opportunity, efforts must extend beyond isolated initiatives. A holistic approach that integrates gender perspectives across the entire EV value chain from research and manufacturing to marketing, service, and policy formulation is the need of the hour.

This report is a sincere effort in this direction. It examines existing barriers, highlights enabling factors and best practices, and proposes actionable strategies to foster women's participation in both the workforce and EV adoption.

Understanding Barriers to Female Labour Force Participation

Gender gaps that hinder female participation in the workforce are complex and multidimensional. They can broadly be categorized into three groups: supply-side barriers, demand-side barriers, and ecosystem-level factors.

- **Supply-side barriers** primarily arise from constraints related to time, mobility, and social responsibilities. Women often face dual burdens of professional work and domestic duties, including childcare and eldercare. Limited access to safe and affordable transportation further restricts their mobility and ability to pursue employment opportunities. In addition, gender gaps in technical education and exposure to industrial work reduce women's preparedness for emerging roles in advanced manufacturing and technology sectors.
- **Demand-side barriers** are shaped by the way organizations structure job opportunities and workplace benefits. Many women are excluded from recruitment pipelines due to the lack of gender-responsive hiring policies and inadequate provisions for maternity leave, flexible working hours, and re-entry programs. The absence of supportive infrastructure such as childcare facilities at or near workplaces further discourages women from pursuing long-term careers in manufacturing and transport-related fields.
- **Ecosystem-level factors** stem from social and cultural norms that continue to influence gender roles and responsibilities. Traditional expectations often confine women to unpaid care work and discourage them from entering technical or labor-intensive professions. In addition, safety concerns and the risk of gender-based discrimination or harassment in workplaces and public spaces act as powerful deterrents to female workforce participation.

Addressing these barriers requires a multi-pronged approach that combines policy reform, industry leadership, and societal change. Understanding their interlinkages is essential to designing effective interventions that can facilitate women's entry, retention, and advancement within the workforce, particularly in the context of the evolving EV ecosystem.

Indian Context

In India, low female labor force participation continues to be influenced by structural, social, and cultural factors. The Periodic Labour Force Survey (PLFS), conducted by the Ministry of Statistics and Programme Implementation (MoSPI), highlights that domestic responsibilities remain the leading reason preventing women from joining or continuing in the workforce. This underlines the need for greater institutional and community-level support systems that can ease the care burden and enable women to balance work and family commitments.

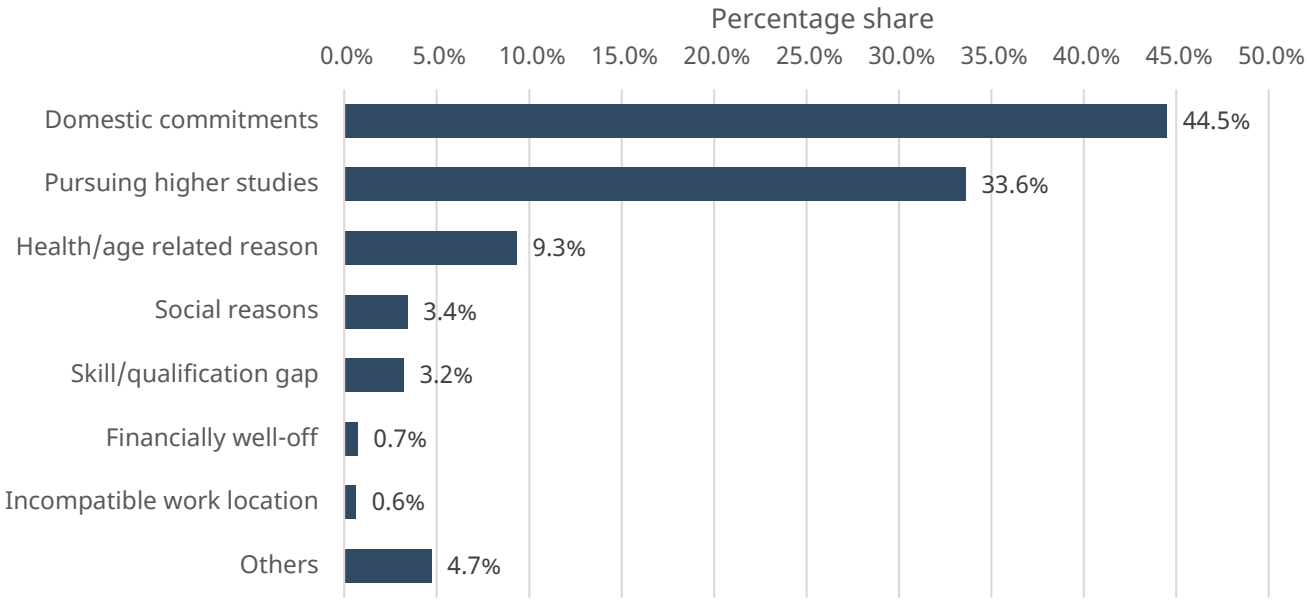


Figure 1: *Factors for low female participation in India's labour force*[2]

The government has introduced schemes that intend to aid the economic inclusion of women such as the Rashtriya Mahila Kosh[3], Swayam Siddha Scheme[4], and the STEP (Support to Training and Employment Programme) Scheme[5]. These schemes aim to provide financial assistance to spur women's entrepreneurship and impart skills and competencies to support their participation in the labour force. While such programs have been successful in targeted outcomes, there remains a regulatory and social gap in addressing deeper systemic barriers such as restrictive gender norms, limited mobility, and safety concerns.

In the context of the EV transition, understanding these underlying issues is crucial. The shift toward a clean and technologically advanced transport system can act as a strong driver for women's empowerment, provided that policies and industry practices are intentionally designed to promote inclusivity. The EV sector can therefore serve as a model for gender-responsive industrial transformation that combines sustainability with social equity.

1.1 Objectives of the Study

This study aims to present a comprehensive analysis of the challenges and opportunities related to gender mainstreaming in India's automobile industry, particularly in the context of the ongoing transition to electric vehicles. The primary objectives are as follows:

- **Identify Enablers and Challenges:** Examine the factors that have facilitated women's participation in the automobile sector and analyze the barriers that continue to limit inclusion across different stages of the EV value chain. The study also seeks to understand institutional and social constraints through targeted surveys and stakeholder engagement.
- **Document Best Practices:** Highlight successful examples of organizations and initiatives that have demonstrated measurable progress in promoting gender diversity, equity, and inclusion in the automotive and mobility sectors.
- **Propose Solutions:** Develop evidence-based recommendations and actionable strategies to address identified barriers and enhance

2 https://dge.gov.in/dge/sites/default/files/2023-05/Female_Labour_Utilization_in_India_April_2023_final__1_-pages-1-2-merged__1_.pdf

3 Scheme to provide soft loans to women for economic activities

4 Financial assistance for sustainable livelihood and asset ownership

5 https://fpibengaluru.karnataka.gov.in/storage/pdf-files/Technical%20Reports/FPI%20Gender%20Mainstreeming%20Version-2%2013-07-2021.pdf

women's participation across the EV ecosystem.

- **Engage Stakeholders:** Collaborate with industry leaders, policymakers, and grassroots-level organizations to promote gender-responsive practices and ensure that recommendations are both practical and scalable.

Through these objectives, the report aims to create a roadmap for integrating gender inclusivity within the broader EV transition strategy, positioning the automobile sector as a leader in shaping a sustainable and equitable future.

1.2 Methodology and Structure of Report

Research Design

This study adopts a layered thematic analysis approach to explore the complex factors influencing women's participation in the EV sector and to derive actionable recommendations for enhancing gender inclusion. Given the multi-dimensional nature of the issue, a cross-sectional research design was used to capture insights across various segments of the automobile value chain and related ecosystems. To achieve this, the study employed the *Content analysis* research method[6], which is an approach that enables analysis of documents and texts that seek to quantify content in terms of predetermined categories and in a systematic and replicable manner. This flexible analytical framework is suited for examining gender mainstreaming within evolving industrial contexts.

A critical part of the content analysis methodology is the process of coding. Two primary elements of coding involve the design of a coding schedule and a coding manual. Coding Schedule defines the themes on the basis of which the study data is to be analysed. The coding manual captures the list of categories/parameters that are subsumed under each theme of the coding schedule.

The coding schedule for this study is guided by the STEEP framework, which encompasses Social, Technological, Economic, Ecological, and Political dimensions. These pillars allow for a holistic understanding of the external trends, forces, and systemic factors that influence the sector's evolution and its potential for gender inclusion. It is particularly relevant to emerging technology-driven sectors such as electric mobility, where social dynamics and industrial transformation intersect. The five dimensions of the STEEP framework are briefly outlined below:

- Social: Cultural forces that have an influence on our mindsets, belief systems, practices, customs, traditions, interests, opinions, that create or develop our behaviors
- Technological: Changes in technologies and processes that are used (or may be used)
- Ecological: Influences, societal attitudes, or legislation related to safety, ecology, pollution, waste management/disposal, clean air and water, and energy saving methods
- Economic: Purchasing power, consideration of national/global interest rates, trade, taxes, inflation, state subsidies, availability of jobs and entrepreneurship
- Political: Shifts in situation or power, local/state/federal legislation, clarity of law/regulation, or lobbying that can create advantages or opportunities.

The coding manual was populated with relevant parameters from an extensive literature review, which were identified as necessary metrics to gather information on the enablers and challenges to gender mainstreaming in the EV sector. Consequently, questionnaires for the primary survey and in-depth interviews were developed to gather the relevant study data. The respective coding manuals (STEEP parameters) for each of the surveys have been provided in the quantitative analysis section.

Data Collection

The first step in the study involved mapping the EV value chain to identify major components and processes across both the supply and demand sides. This mapping provided a structured

6 https://books.google.co.in/books?id=N2zQCgAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0

foundation for identifying points of intervention to promote gender inclusion.

To complement secondary research, the study also conducted primary surveys and in-depth interviews with stakeholders across key segments of the EV ecosystem. These interactions captured on-the-ground perspectives and provided qualitative insights into institutional practices, workforce trends, and challenges faced by women in the sector.

Primary Survey: Three categories were identified across the demand and supply sides of the EV ecosystem - EV OEM workforce, EV users in the gig economy, and EV owners (current and prospective). In-person surveys were conducted across prominent EV OEMs to gather insights from their women workforce from April to July 2025. A similar exercise was conducted with women engaged as driving partners with prominent ride-hailing platforms. A comprehensive Google Form was developed and circulated to gather critical demand-side insights to improve EV adoption.

Sample profile of respondents from the EV OEM workforce is provided in Figure 2. As observed, on average, the respondents had less than of five years of work experience, and over 80 percent of the respondents had acquired a bachelor's degree or higher to join the EV OEM workforce.

Sample profile of respondents from the Gig economy survey is provided in Figure 3. As observed, over 30 percent of the respondents were relatively new to the sector and had less than a year of total work experience. A majority of the respondents (~52 percent) indicated more than 10 years of work experience implying presence of new opportunities for women participation in this sector. Concerning the level of education, over 90 percent of the respondents had obtained a higher secondary qualification or below.

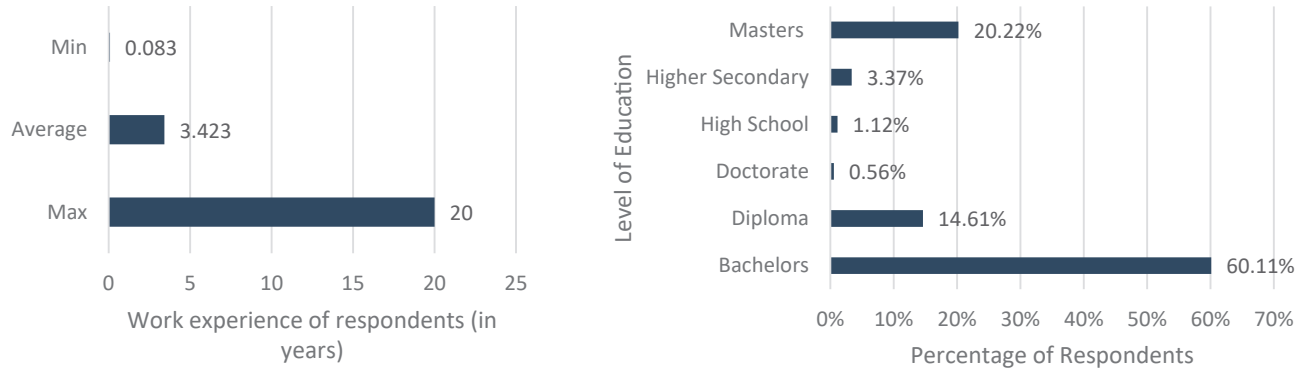


Figure 2: *Level of education and work experience of respondents from the EV OEM workforce survey*

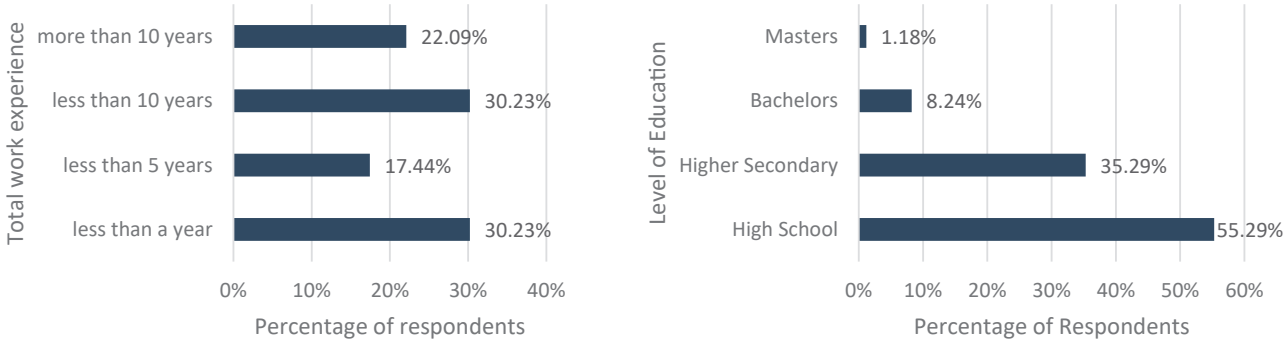


Figure 3: *Level of education and work experience of respondents from the Gig economy survey*

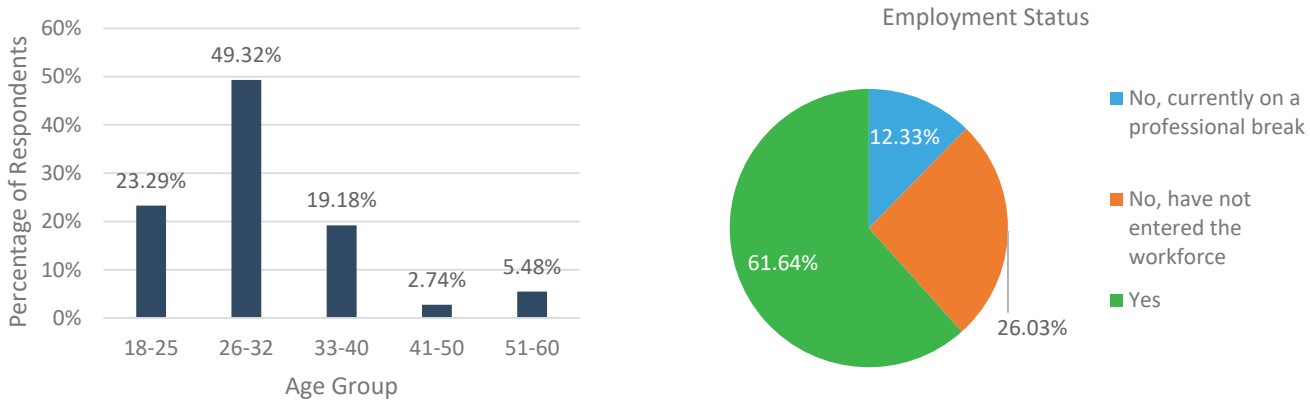


Figure 4: *Age group and employment status of respondents from the EV ownership survey*

Sample profile of respondents from the EV ownership criteria survey is provided in Figure 4. As observed, majority of the respondents were below the age of 32 (~72 percent), and over 72 percent of the respondents conveyed that they were currently employed or undertaking a professional break, indicating vehicle purchasing capacity of self.

The in-depth interviews were conducted with women professionals present in mid-level and above leadership positions at companies across the EV value chain. Case studies were developed from the insights received, and the information was analysed as per the coding schedule of the study. The cross-cutting reflections from the primary survey and the in-depth case studies were derived to propose final recommendations.

Structure of Report

The report is organized into three interlinked parts:

- Part I presents insights from the quantitative data collected through primary surveys, highlighting trends and patterns in women's participation across different facets of the EV value chain.
- Part II details case studies based on findings from in-depth interviews, showcasing practical experiences and best practices from organizations actively engaged in promoting gender inclusivity.
- Part III synthesizes the insights from Parts I and II to identify key structural and institutional gaps and outline strategic enablers that can support gender mainstreaming in India's emerging EV workforce.

Together, these components provide a comprehensive evidence base for understanding the current state of gender inclusion in the EV sector and inform policy, industry, and institutional actions to strengthen women's participation in the transition toward sustainable mobility.

2

Mapping the Automobile Value Chain

2. Mapping the Automobile Value Chain

The EV value chain was mapped, as illustrated in Figure 5, to identify opportunities for women's participation across different segments of the sector and to understand the key end-user groups that can drive greater EV adoption among women. This mapping exercise serves as a foundation for analyzing both the supply-side and demand-side dimensions of the EV ecosystem, highlighting areas where targeted interventions can promote gender inclusion.

On the supply side, the analysis focuses on stakeholders involved in the manufacturing of EVs, their components, charging infrastructure, and other technical systems. These areas represent significant potential for women's participation, particularly as technological advancements shift the nature of work from being physically intensive to more skill- and knowledge-oriented.

The demand side includes fleet operators and driving partners, especially within the expanding gig economy, where flexible work arrangements can offer new pathways for women's economic engagement. In addition, private vehicle ownership has been identified as a crucial segment for understanding barriers and opportunities related to increasing EV adoption among women users.

A vital link between the supply and demand sides lies in the sales, service, and operations ecosystem, where dealerships, service centres, and mobility platforms play an enabling role. Moreover, training and skilling institutions as well as EV financing mechanisms form critical support systems that can significantly influence women's access to employment and ownership opportunities.

Finally, with the growing emphasis on integrating circular economy principles into the EV sector, the end-of-life management segment, covering battery recycling, repurposing, and waste recovery, emerges as an important new frontier. Embedding gender considerations at this foundational stage of the industry's development can ensure that women are equitably represented in the evolving value chain and benefit from the long-term growth of the sector.

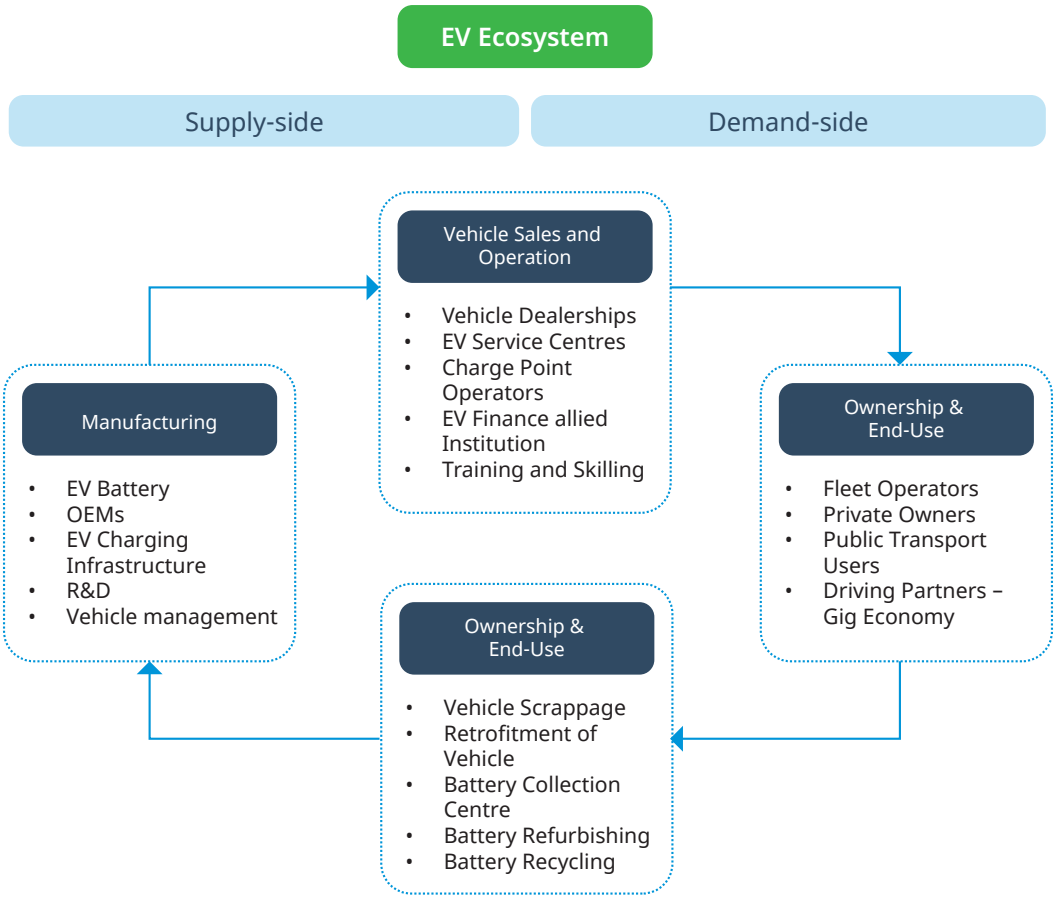


Figure 5: *EV value chain reflecting opportunity areas for gender mainstreaming*

In the context of the study, the scope of each stakeholder mapped in the EV value chain is described in Table 1.

Table 1: Stakeholder scope identified in the EV value chain

Stakeholder Category	Scope
Manufacturing	
EV battery	Entities engaged in EV battery manufacturing
OEMs	Entities engaged in manufacturing of EV and its components
EV charging infrastructure	Entities engaged in manufacturing of EV charging equipment
R&D	Entities engaged in R&D pertaining to battery technology, EV charging technology, vehicle ergonomics, etc.
Vehicle management	Entities engaged in providing digital services encompassing areas such as fleet management system, inventorisation, supply chain management, etc.

Stakeholder Category	Scope
Vehicle Sales and Operation	
Vehicle dealerships	Entities engaged in promotion and sale of EVs
Charge point operators	Entities engaged in management and operation of public charging stations, facilitating charging services for EV users
EV service centres	Entities engaged in servicing of on-road EVs
EV finance-allied institutions	Entities engaged in innovative finance/insurance solutions to support consumer EV purchase
Training and skilling	Entities engaged in providing training to upskill existing workforce to adapt to the requirements of EV ecosystem
End-of-life Management	
Vehicle scrappage	Entities engaged in scrapping of end-of-life vehicles
Battery collection centre	Entities engaged in the collection of end-of-life batteries
Battery refurbishing	Entities engaged in second-life applications of EV batteries
Battery recycling	Entities engaged in reprocessing of used batteries for recovery of critical materials and enable their reuse
Retrofitment of vehicle	Entities engaged in conversion of existing ICE vehicles to battery electric vehicles
Ownership and end-use	
Fleet operators	Stakeholders engaged in logistics solutions and managing a fleet of vehicles for businesses
Driving partners - gig economy	Stakeholders active in the gig economy and using EVs for their operations.
Private owners	Stakeholders owning an EV
Public transport users	Stakeholders with a preference for public transport to cater to their transport needs

3

Gender and the Automobile Sector: Contextual Overview

3. Gender and the Automobile Sector: Contextual Overview

3.1 Status of Women in the Indian Labour Market

As per Census 2011, the total number of workers (who have worked at least for one day during the reference year) in India was 481.89 million, with 68.9% being male and the remaining 31.1% female[7]. The total number of workers, based on RBI estimates, has increased to 643.3 million in 2024.[8] During the same period, the work participation rate (WPR) has increased from 39.8 percent to 58.2 percent.[9] Despite the increase in WPR, a significant gap remains in participation between the male and female workforces. Figure 6 illustrates the labour force participation rate (LFPR) for both males and females between 2017-18 and 2023-24. The female LFPR stood at a lowly 23.3 percent compared to 75.8 percent for males in 2017-18, a significant 52.5 percent difference. Over the ensuing six years, the difference has reduced to 37.1 percent, with the female LFPR reaching 41.7 percent.

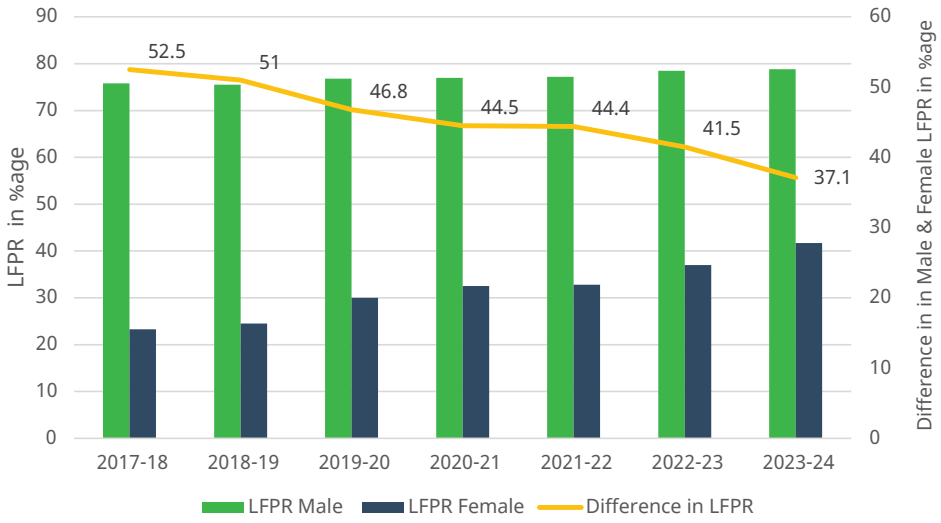


Figure 6: *LFPR (in percent) in usual status for males and females above 15 years from 2017-18 to 2023-24*

7 https://labourbureau.gov.in/uploads/pdf/ILS_202223_Final.pdf
8 https://www.rbi.org.in/scripts/klems.aspx
9 https://www.mospi.gov.in/sites/default/files/publication_reports/AnnualReport_PLFS2023-24L2.pdf

The major push for the increase in female LFPR has come from rural areas, as depicted in Figure 7. The rural female LFPR has increased at a CAGR of twelve percent between 2017-18 and 2023-24, compared to only six percent for urban females.

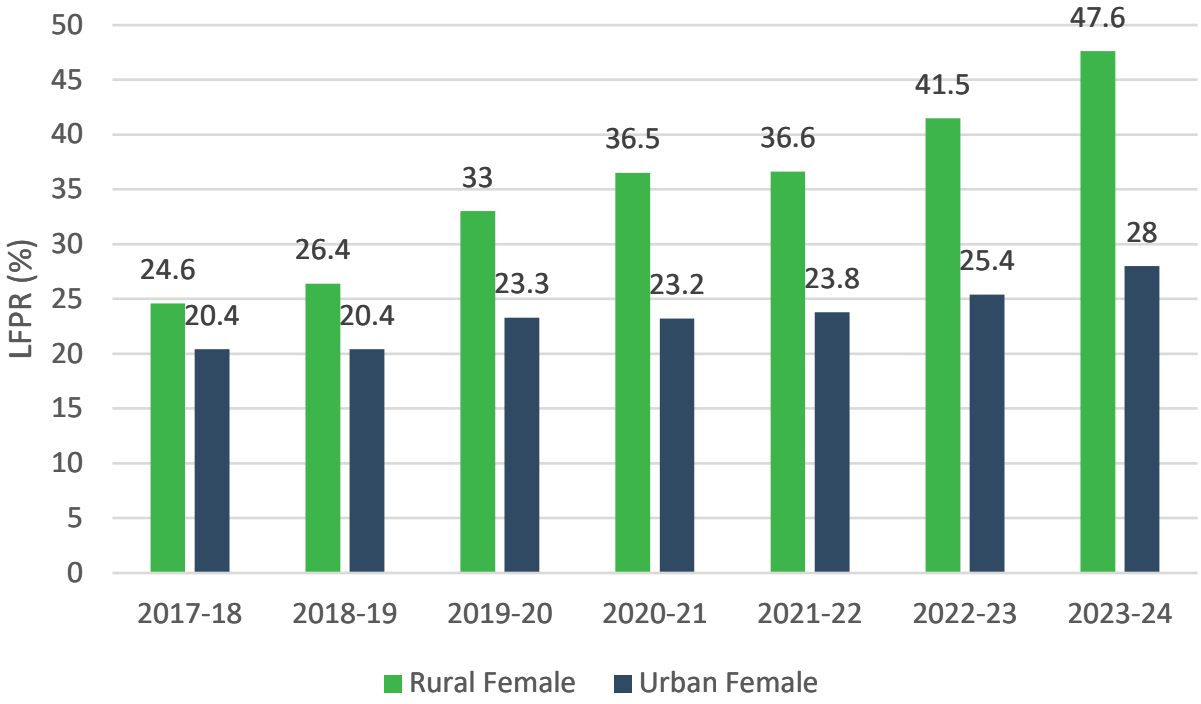


Figure 7: *LFPR (in percent) in usual status for rural and urban females above 15 years of age from 2017-18 to 2023-24*

An analysis of the female labour utilisation components within the two broad activities - 'being in labour force' and 'not being in labour force' - provides further understanding of the status of women in the labour market. Female labour force participation in India is skewed towards self-employment, followed by regular wage or salaried employees, as depicted in Figure 8. Out of all the rural females in the labour force, 73.5 percent are self-employed, largely due to the high incidence of agricultural work, followed by 8.3 percent of casual labourers. The scenario changes drastically in an urban setting, with more than 49 percent of females employed as regular wage or salaried employees, followed closely by 42.3 percent as self-employed.

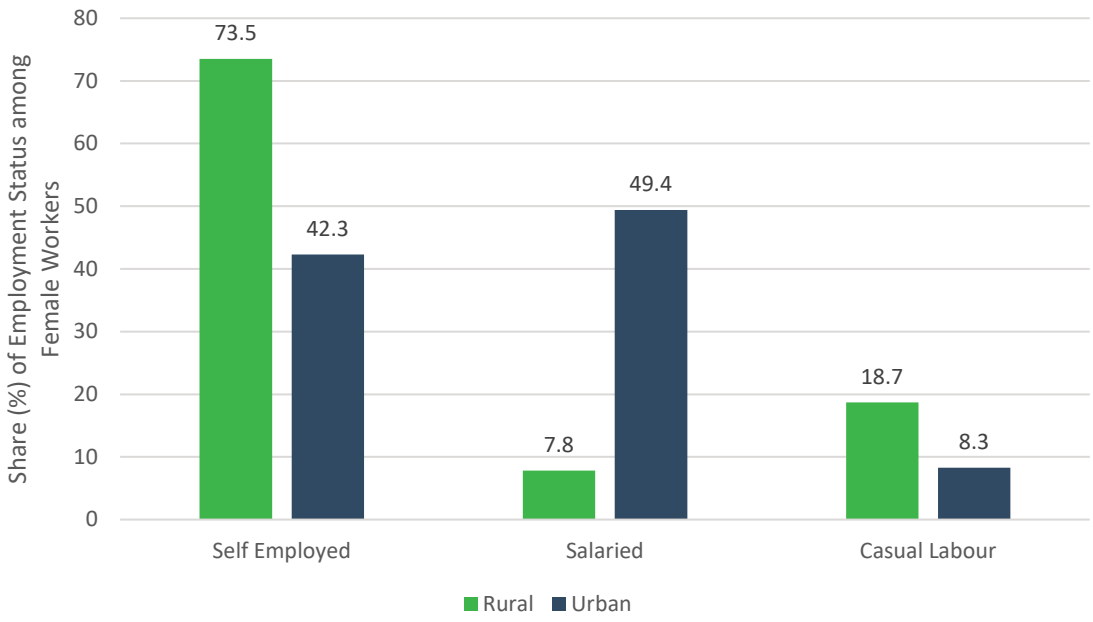


Figure 8: *Status of employment among female workers in the usual status in 2023-24*

A comparative analysis of males and females not in the labour force, as shown in Figure 9, depicts drastic differences. Around half of the females not in the labour force attribute their reason to domestic duties, followed by education, with thirty-three percent. For males, close to two-thirds cite education as the reason for not being in the labour force, while a lowly two percent attribute it to domestic duties.

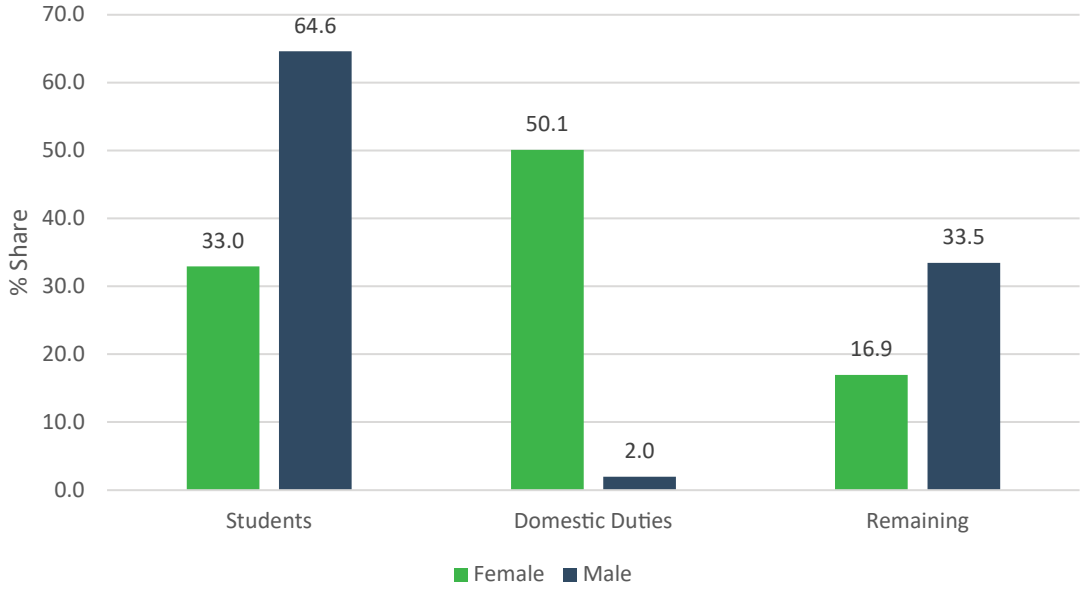


Figure 9: *Percentage share of the status of females and males not in the labour force in 2023-24*

This data makes it clearly visible that the majority of women remain outside the labour force due to unpaid domestic work, such as child care, free collection of goods, sewing, tailoring, weaving, etc., for household use.[10] While this work is essential for people's well-being and the functioning of the market economy, it remains invisible.[11] Finally, it has long been understood that in India, women's education has a U-shaped relationship with LFPR.[12] Figure 10 reaffirms this, as it shows a higher level of LFPR among illiterate and college-educated women as compared to those who have completed secondary or higher secondary education. At low levels of education, women often work out of financial necessity, especially in unorganised sectors like agriculture. The LFPR declines at medium education levels due to social status and low-wage aversion, but rises again at higher education levels with access to white-collar jobs and greater social freedom.

3.2 Gender Dynamics in the Automobile and Mobility Sectors

Existing studies examining the gender dynamics in the automobile point towards the historical exclusion of women and their disadvantaged position in the automobile sector. There are several factors ranging from social, economic and cultural reasons that have contributed towards skewed female participation in this sector. An analysis done of 103 NSE listed companies in the automobile and auto components sector in India found that women represent overall only 13% of the workforce in the sector, which includes 9% at the employee level and 15% representation at the worker level. The study also found women's representation to be 14% and 18% in key management positions and in the Board

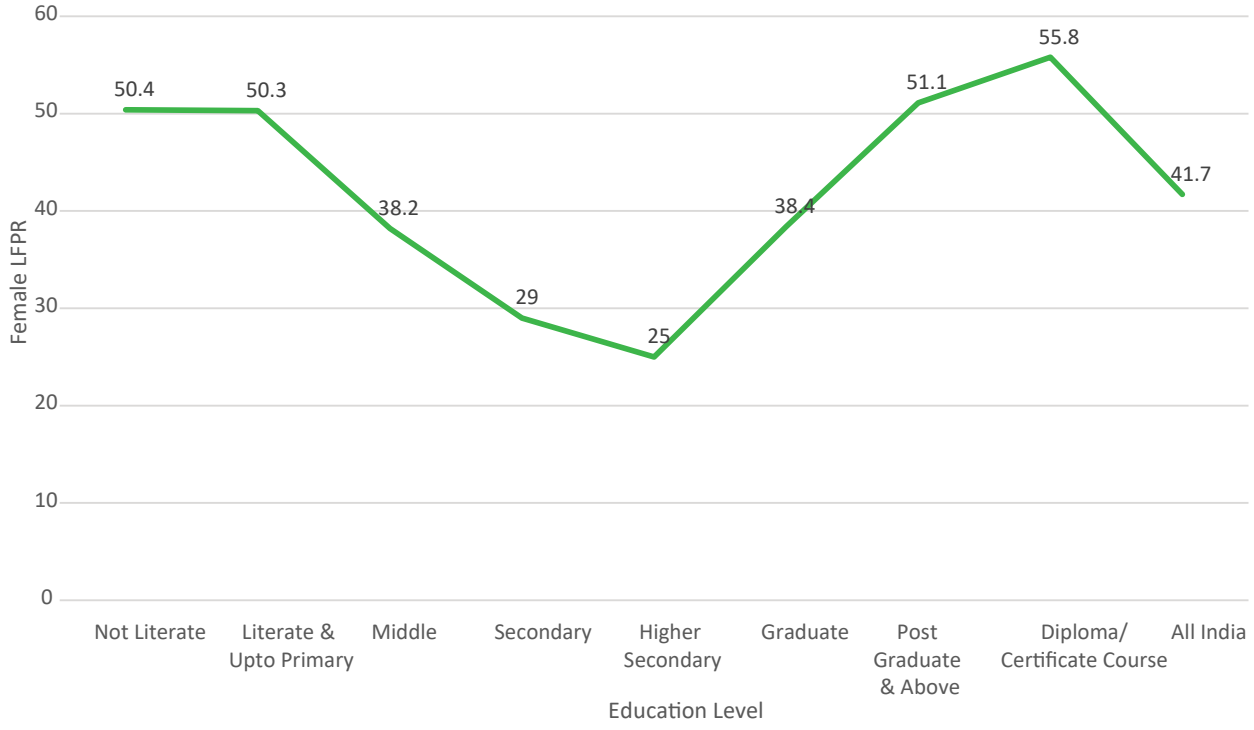


Figure 10: *Relationship between female LFPR and education level in 2023-24*

10 https://dge.gov.in/dge/sites/default/files/2023-05/Female_Labour_Utilization_in_India_April_2023_final__1_-pages-1-2-merged__1_.pdf

11 https://asiapacific.unwomen.org/sites/default/files/Field%20Office%20ESEAsia/Docs/Publications/2017/01/Unpaid-Care-and-Domestic-Work-EN.pdf

12 https://documents.worldbank.org/en/publication/documents-reports/documentdetail/559511491319990632/precarious-drop-reassessing-patterns-of-female-labor-force-participation-in-india

of directors for these companies respectively.[13] The lack of female leadership and women in higher positions in these automotive companies is seen as a challenge to encourage more women to join the sector and be able to rise within it.

The historical lack of representation of women, as well as the difficulties women face within the sector reinforces the idea of the automotive industry being a masculine one. The perception of a hostile and unsupportive work environment, along with many other factors we will cover later such as societal pressures, lack of education, safety concerns etc. have essentially shut the doors for women to even consider joining the industry. A 2024 UK based study finds that 1 in 3 women would never consider a career in the auto industry, compared to 80% of men who would.[14] For those women already working in the industry, lack of work and life balance, promotion opportunities and lack of diversity, equity, and inclusion within the companies are major reasons for them to leave. A 2020 report on women's representation in the US's automotive sector revealed that 45% of women surveyed said they would move to a different industry if they were to start their career today.[15] In another 2019 survey conducted in India to assess the experiences of women working in the automotive industry, respondents expressed that they felt underrepresented and were not given challenging roles. Moreover, in most cases they felt the HR personnel was unable to handle women-centric issues.[16]

Even within the industry, there is a high degree of occupational segregation based on gender with female workers concentrated in white collar jobs in departments like R&D and HR with very limited involvement in the shop floor given the existing bias of women being unable to engage in intensive manual labour.[17] While there are relatively fewer women, there are still women in such roles and due to historical disadvantages and lack of gender specific considerations they are put at risk of injury, discrimination and harassment on the job. A study finds that the severity of injuries, particularly crush injuries from operating power presses, among women in India's auto sector has been rising steadily from 2019 to 2024. Women are also paid less than men for operating the same dangerous machines with more women operators and helpers being paid less than ₹ 9,000 as compared to men. In general most of the industries sustained were by migrant workers, lesser paid workers and lesser educated and informal workers, which makes women also part of this vulnerable group.[18]

Across the value chain, we must strive to increase female participation representation and give women a greater chance to leverage the economic opportunities emerging across the value chain, from vehicle manufacturing, the R&D, automation, the gig economy and other operational roles in the industry.

As we witness several changes in the automobile industry with the shift from ICE vehicles to EVs and a larger movement towards sustainable transport and mobility sector, the inclusion of women in all levels and roles in the industry is pertinent. We are witnessing women's representation and participation increase in the automobile sector, especially with the rise of e-mobility. A report notes that the EV industry requires an understanding of electrical components rather than mechanical and physical labor as needed in traditional automotives, and this suits the skill sets available from women employees. This has resulted in many EV companies in India, hiring more women than men.[19]

13 https://closethegendergap.udaiti.org/udaiti/cgg-resources/Auto-Sector-Scorecard.pdf

14 https://www.fleetpoint.org/general-fleet-news/auto-industry-unattractive-to-over-a-third-of-women/

15 https://www.deloitte.com/content/dam/assets-zone3/us/en/docs/industries/energy-resources-industrials/2020/us-women-at-the-wheel-2020-executive-summary-final.pdf

16 https://www.researchgate.net/publication/335660314_Women_Participation_in_Automobile_Industry_Challenges_Road_Ahead

17 https://editors.cis-india.org/internet-governance/future-of-work-in-automotive-sector.pdf

18 https://www.safeinindia.org/post/crushed-2024-india-s-only-annual-report-on-workplace-injuries-and-workers-safety-in-the-automobile

19 https://cis-india.org/internet-governance/pdf-automotive-case-study

A report by the OMI foundation captures the trends and developments in increasing women's representation across the EV value chain- from shop floors, where companies like Ampere, Ola and more now have women run assembly lines, to women in entry and middle management roles engaged in functions like embedded design, product development, testing, component designing, battery management systems and software development etc., to C-suite jobs and leadership roles.[20]

While there are several positive indicators of women's increased participation in the EV industry, there are also several pitfalls which if remained unaddressed can unfortunately perpetuate the same gender dynamics as historically seen in the automobile industry.

3.3. Comparative Insights from Other Countries and Industries

Promoting gender equality in mobility and transport systems requires not only policy intent but also deliberate, inclusive design and implementation. Across the world, cities and states have adopted innovative gender-sensitive measures that address women's safety, accessibility, and representation in the workforce. The following case studies illustrate how integrating gender perspectives into planning, infrastructure, and governance can create safer, more equitable, and inclusive urban environments.

Drawing from international experiences across mature and emerging automotive markets, this section examines how different national contexts and interventions have addressed gender dimensions. The comparative analysis presented herein aims to identify transferable lessons, highlight successful approaches, and contextualise challenges that may inform gender-inclusive strategies for India's automotive sector transformation.

20 https://olawebcdn.com/ola-institute/ev-ready-feminising-ev-value-chain.pdf

The section examines gender outcomes through three levels of analysis:

- National and city level policies and industrial strategies (macro)
- Sector specific initiatives and industry interventions (meso)
- Organisational/workplace practices (micro)

National and City Level Policies and Strategies

At the national policy and industrial strategy level, several countries have introduced measures to enhance gender balance in the transport and automotive workforce. The **European Union** has mandated that by 2026, women must constitute at least 40 percent of company boards, signaling a major step toward institutional gender parity.[21] Also, the **United Kingdom's** Automotive Council has adopted the **"30 by 30"** pledge to ensure that 30 percent of the automotive workforce is female by 2030.[22] Supporting this goal, the **Institute of the Motor Industry's (IMI) Diversity Task Force** has led initiatives that promote mentorship, female leadership, and inclusion programs, with a focus on underrepresented groups such as women in the EV sector.[23]

Chile's Ministry of Transport and Telecommunications has implemented **dedicated incentives to encourage women's participation in public bus driving,** including more flexible licensing requirements and certification/accreditation requirements to obtain a professional public transport driver's license. These efforts are complemented by the "Premiación Anual a los Mejores Conductores y Conductoras" (Annual Award to the Best Drivers), organised by the Metropolitan Public Transport Board (DTPM) and Transantiago (Public Transport System) operating companies, which **recognises outstanding female drivers each year.**[24]

21 https://ec.europa.eu/commission/presscorner/detail/en/ip_25_22

22 https://www.automotivecouncil.co.uk/2023/11/uk-auto-industry-pledges-to-address-diversity-shortfall/

23 https://tide.theimi.org.uk/equity-diversity-and-inclusion/diversity-task-force

24 https://transformative-mobility.org/wp-content/uploads/2023/04/Mujeres-Conductoras_EN.pdf

The city of **Vienna** has been a pioneer in advancing gender equality[25] for over three decades by integrating gender mainstreaming into urban planning and governance. The inclusion of **more women architects** has influenced building designs with lower structures for better street visibility, wider footpaths, ramps for prams and bicycles, and improved street lighting - all contributing to safer mobility.[26] Additionally, **gender budgeting has ensured equitable access to city infrastructure**. Vienna has also adopted symbolic yet meaningful interventions such as introducing female pictograms on pedestrian crossings and road worker signage to promote inclusivity in public spaces.

In **London**, Transport for London (TfL) has adopted a data-driven approach to promote inclusivity[27]. Using big data analytics and perception surveys, TfL **identifies travel patterns and mobility challenges faced by diverse communities.** The insights inform targeted actions around safety, accessibility, affordability, and workforce diversity. TfL also **runs internship programmes** aimed at attracting candidates from underrepresented groups and publishes annual workforce diversity reports to track progress in women's employment.

The **city of Bolzano, Italy**, has implemented the time and schedules plan, which includes initiatives like **Taxi Rosa** - a night-time taxi service available to women at discounted rates, and **Parcheggi Rosa (pink parking)**, designated well-lit parking spaces near exits reserved for women. These measures have enhanced safety and mobility options for women, particularly during non-peak hours.[28]

Sector Specific Interventions

Sector specific interventions in Latin America and Asia also provide further insight into how gender inclusion can be embedded within mobility transitions. In **Bogotá, Colombia**, the **La Rolitas Eco-Driving Program** has been a landmark effort to train and employ women as electric bus drivers under the city's Integrated Public Transport System (TransMilenio).[29] This is a coordinated effort of the city's integrated public transport system (TransMilenio), District Mobility Secretariat, District Secretariat for Women's Affairs and National Learning and Employment Service. Under this program, women are financially supported in the form of **stipend for completing training of public transport drivers** and also **cover all administrative costs needed to obtain a new license**. Since the launch of this program in 2021, more women have been hired and now female bus drivers comprise 50 percent share, as compared to the city's previous 5 percent.[30]

In **Kathmandu, Nepal,** women by becoming drivers have been at the forefront of the **Safa Tempo movement - a public electric 3-wheeler transport system**. This model has not only generated stable income for women but has also contributed to safer commuting environments, as passengers report feeling more secure in women-operated vehicles. [31]

Organisational Level Programmes

At the organisational and workplace level, companies and service providers are experimenting with targeted interventions. **Uber** has launched a two-year program worth one million euros to attract and retain more women drivers across Europe.[32] The initiative includes **subsidies for Private Hire Vehicle licenses, discounted access to vehicles, targeted information campaigns, referral schemes, and dedicated communities for women drivers to connect and share experiences.** Also, manufacturing companies such as **Ford** have **expanded recruitment and training initiatives for female engineers,** as well

25 https://www.theguardian.com/cities/2019/may/14/city-with-a-female-face-how-modern-vienna-was-shaped-by-women

26 https://sydney.org.au/wp-content/uploads/2023/09/Committee_City-for-Women-Final.pdf

27 https://assets.publishing.service.gov.uk/media/5a759a71e5274a43682988bd/equality-action-plan.pdf

28 https://eige.europa.eu/gender-mainstreaming/policy-areas/transport?language_content_entity=en

29 https://transformative-mobility.org/wp-content/uploads/2023/04/Mujeres-Conductoras_EN.pdf

30 https://use.metropolis.org/case-studies/la-rolita---district-transport-operator

31 https://winrock.org/how-women-are-driving-change-in-kathmandu/

32 https://transport.ec.europa.eu/transport-themes/social-issues-equality-and-attractiveness-transport-sector/equality/women-transport-eu-platform-change/ubers-commitment-become-most-accessible-platform-women-drivers-europe_en

as piloted the 'InSight' program to increase their representation in higher leadership roles.[33]

Key Insights

Together, these examples illustrate that increasing women's participation in the E-Mobility ecosystem requires a mix of regulatory reforms, industry leadership, and supportive workplace practices. Countries that have integrated gender considerations into policy design and industrial planning demonstrate more sustained and measurable progress. For India, such global insights can serve as useful references to inform equitable workforce strategies as the nation accelerates its own automotive transition.

- **At the macro level, regulatory mandates with clear targets can be undertaken to drive institutional change.** Chile's inter-ministerial coordination illustrates the value of integrated policy approaches. Transport for London's use of big data analytics and perception surveys to identify mobility challenges faced by diverse communities offers a replicable model for understanding gendered travel patterns.

For India, these approaches suggest embedding measurable gender targets within existing frameworks such as Make in India and the National Electric Mobility Mission, while leveraging digital infrastructure capabilities for comprehensive data collection on women's participation across the automotive value chain.

- **At the meso level, sector specific interventions have achieved remarkable results through targeted financial support and systematic training.** Bogotá's coordinated multi-stakeholder efforts resulted in women comprising 50 percent of bus drivers. This was achieved by providing stipends for training completion and covering all administrative costs for obtaining new licenses, thereby removing critical entry barriers. Kathmandu's Safa Tempo movement similarly demonstrates how women drivers in electric 3-wheeler transport systems generate stable income while contributing to safer commuting environments. Chile further shows how recognition mechanisms create visibility and aspirational role models.

For India, these examples point toward replicating subsidized training models through Skill India programs or state EV policies, partnering with state transport corporations for women focused recruitment drives, and leveraging Industrial Training Institutes to offer gender sensitive automotive courses, particularly in emerging EV related skills.

- **At the micro level, organisational and workplace practices require both corporate commitment and attention to infrastructure design.** Uber's program includes efforts towards providing financial support, building awareness, and creating support networks for women drivers. Ford's program to increase women's representation in leadership roles, illustrates the importance of creating pathways beyond entry level positions. Bolzano's interventions demonstrate practical interventions that enhance safety during non-peak hours.

For India, these examples underscore the need for automotive companies to adopt diversity targets, design workplace infrastructure considering women's needs (including lighting, restrooms, and changing facilities), and create mentorship programs connecting women across the automotive ecosystem.

However, India faces distinct contextual challenges that require adaptation of these global models. The country's geographic and socio-cultural diversity demands localised approaches, with the urban-rural divide necessitating different interventions for metropolitan areas versus tier 2 and tier 3 cities. The dominance of the informal sector in India's mobility landscape makes regulatory interventions harder to implement compared to formal corporate structures. Infrastructure gaps remain a constraint, as safety infrastructure such as lighting, secure parking, and toilet facilities are underdeveloped. Social and cultural barriers, including family and community perceptions about appropriate work for women and safety concerns around night shifts or

33 https://auto.economictimes.indiatimes.com/news/industry/ford-increases-recruiting-training-of-women-engineers-in-asian-markets/57553764

in manufacturing settings, present challenges that require community-engaged solutions.

Some Case Studies from India

In India, several cities have undertaken gender-sensitive interventions to make the transport and automobile sector more gender inclusive. In **Bhubaneshwar**, the Capital Region Urban Transport (CRUT) collects **gender-disaggregated ticket data** to make evidence-based decisions. Its **E-Ride initiative employs women and transgender drivers,** enhancing inclusivity in urban mobility. These efforts have had measurable impacts - 63 percent of women users rated the city bus system as safe and affordable, while 57 percent shifted from other modes to the bus service.

The State of **Kerala** has also made notable strides through the **Gender Equality and Women Empowerment Policy (2015),** which provides a framework for equal access to opportunities and resources across genders[34]. The state police introduced several initiatives—such as **Vanitha Police, Pink Patrols, and women-friendly police stations** - to improve safety and surveillance. The Kerala State Road Transport Corporation (KSRTC) **opened driving and conductor positions to women** as early as 1992, and together with the Motor Vehicles Department, is developing a Suraksha-Mitra command and control centre equipped with **real-time bus tracking and panic buttons.** However, despite these progressive initiatives, women's participation in the transport sector remains limited - only 6.3 percent of police personnel are women, and the number of female conductors in KSRTC has been declining. This suggests that while policies exist, deeper challenges such as unsafe working conditions, long hours, and lack of supportive infrastructure continue to hinder women's active engagement in the sector.

Overall, these case studies highlight that gender mainstreaming in urban planning and mobility not only enhances women's safety and participation but also leads to more inclusive, responsive, and equitable transport systems.

34 https://www.mobiliseyourcity.net/sites/default/files/2022-08/Gender%20and%20Mobility.pdf

3.4 Enablers and Barriers Identified in Existing Literature

Barriers to female participation in the automobile industry

As mentioned earlier, women's participation in this sector has been influenced by multiple factors. From individual battles to deep-rooted inequalities, there are several challenges that have prevented women from not just joining the industry, but also from progressing and thriving in it. Since several such barriers are structural or systemic in nature, they are also applicable to women's participation in other industries of the economy. In this section, we have presented the barriers identified in existing research into two categories- Barriers to entry and barriers to growth and retention.

A. Barriers to entry

1. Societal Conditioning and Bias

The societal structuring of the automotive sector to be a male dominated space has had several ramifications on the relationship women have with the industry. Not just in terms of working in the sector but vehicles and cars themselves are seen as products for men. This has been one of the factors contributing to fewer female drivers and vehicle ownership, as well as female workers in the industry. Women have conventionally not been considered suitable to work in the automotive industry as it is seen as physically demanding and labour intensive. Instead, women are seen as more suitable for "pink-collar jobs" which refer to historically feminised sectors and occupations like those in care giving, health and education. Societal conditioning and depictions of women being to be more caring has led to perpetuation of this assumption of their suitability in these roles.[35] The socio-cultural biases and reinforcement of stereotypes by family and in school also

35 https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/03/beyond-pink-collar-jobs-for-women-and-the-social-economy_e34e09c7/44ba229e-en.pdf#:~:text=This%20report%20was%20produced%20by%20the%20OECD,by%20Lamia%20Kamal%2DChaoui%2C%20Director%2C%20as%20part%20of

discourages women from pursuing academics and careers in STEM.[36] This often limits their opportunity to work in engineering and science based industries including the automobile sector, and within it, will be a barrier for them to enter into the EV segment.

2. Safety Concerns

Safety and security is a major barrier preventing women from entering male dominated spaces. The fear of sexual harassment, violence and discrimination, particularly in shop floors and factory sites, and even gig-based jobs which require travel to more remote locations can dissuade women from joining a job or even undertaking training. Often family members themselves persuade their daughters to not take up jobs which require too much travel or physical labor. The absence of affordable and safe public transport is often a reason why women postpone or cancel their travel. Unsafe, inadequate and unaffordable travel options therefore limit. their access to job opportunities.[37]

3. Lack of Access to Education and Vocational Training

Skilling is credited as a tool to bring more women into the work force and leverage the opportunities emerging from the transition to EVs. However, historically, a mix of social, economic and political reasons have resulted in women having a much lower literacy rate than men, with rural women being the most vulnerable.[38] For women to be a significant part of the automotive workforce, ensuring they have the right skills and qualification is essential. However, the enrolment of male students in Higher Education Institutions in India from 2011-12 to 2020-21 in Engineering and Technology, Management, IT and computer streams has been much higher than the enrolment of female students.[39] In ITIs, for data from 2018 only 21 percent of the students were female with 60 percent of the cohort engaged in non-engineering trades, while in apprenticeship cohorts there were only 11 percent women engaged. Several factors such as lack of family support, balancing household duties, lack of awareness, safety concerns, and unsupportive environments prevent women from receiving training. The dropout rate of females, over 5 years from 2014 to 2019 was an average of 23 percent across different categories of ITIs.[40] For women to be given greater chances of securing well paying and decent jobs in the automobile sector, bridging the skilling gap is vital. A World Economic Forum report finds that the gap between women's representation in the total workforce and in senior leadership widens as education levels increase, indicating the inefficiency of current systems to translate women's skills into leadership and economic decision-making roles.

4. Lack of Digital Literacy and Documentation

For some women who have lesser skills and educational qualifications to work in the more technically demanding roles of the automotive sector, opportunities in the service and gig economy can present as good opportunities of decent work, especially in the emerging EV segment. But even for these roles, basic digital skills such as operating a smart phone, running certain applications, and computer skills may be necessary. Therefore, these women need to have basic digital and IT skills. However, many women do not have access to a smartphone or rely on male members of their family to access one. Secondly, documentation and verification can be a barrier for resource-poor women, if they do not have access to their ID cards or if they were never made or lost . [41]

B) Barriers to Growth and Retention

Another set of hurdles exist for the women who are already working in the sector. Many challenges hinder them from rising up the ranks, creating impact and staying in the industry as they navigate

36 https://olawebcdn.com/ola-institute/ev-ready-feminising-ev-value-chain.pdf

37 https://www.sciencedirect.com/science/article/pii/S1757780224001859

38 https://www.mospi.gov.in/sites/default/files/reports_and_publication/statistical_publication/Women_Men/mw24/Education.pdf

39 https://www.bhu.ac.in/Images/files/13_(6).pdf

40 https://dgt.gov.in/sites/default/files/2024-02/Gender_Study_1.pdf

41 https://www.azadfoundation.com/wp-content/uploads/2024/09/Gendered-constraints-in-employemnt-in-public-transport-A-Report.pdf

their own social responsibilities and the complex institutional set up within the workplace.

1. Lack of Infrastructure and Institutional Support

The lack of basic facilities like hygienic restrooms, provision for menstrual hygiene, especially in factories and on the shop floors, rest stops in public spaces restrict women from doing their job in a dignified and safe way. Women, especially in informal sectors, place their health at risk by not drinking water and delaying washroom breaks due to the lack of proper facilities. This can restrict their earning power and place their health at risk.[42]

2. Societal Pressures, Obligations and the Motherhood Penalty

The absence of solid institutional support for women's career trajectories, especially in senior roles, coupled with insufficient measures for work-life balance, poses significant obstacles.[43] Societal pressures on women to both work and run the household, take care of children and family members creates a double burden of work. Lack of flexibility in work times to tend to parental obligations and poor work life balance in the automobile sector can make it difficult for the women to sustain themselves in the industry.[44]

The Voice of Women study which surveyed 24,000 working women in India found that 1 in 3 mothers faced a career setback after returning from maternity. The motherhood or maternity penalty can impact working mother's role assignments, performance evaluations, promotion opportunities and compensation.[45] Nearly 42 percent of educated urban women take career breaks in their 30s or 40s, but only 27 percent manage to return to full-time work within a year.[46]

3. The Gender Pay Gap

Women are not paid at par with their male counterparts in the industry which can discourage women from remaining in the industry. A study reveals that less that 3 percent of CXOs in India's top 11 automobile companies are women and their salaries are also 11 percent lower than male counterparts.[47] In terms of wage disparities in the Indian economy, according to the NSSO, 2017-18 data, women earn only 44 percent of what men earn in the manufacturing sector and 40 percent of what men earn in the IT and software industry. These numbers are significant considering the kind of roles becoming available in the EV value chain.[48]

4. Safety concerns and hostile work environments

The Voice of Women survey found that one in sixteen women or 6 percent out of 24,000 respondent reported having experienced sexual harassment at least once in their careers.[49] In the male dominated automobile sector, women have to work in an unattractive work environment where they face uncomfortable situations in offices and assembly lines. Having to operate in fear and discomfort leads to poor work relations which further affects their ability to network.[50]

5. Limited Opportunities to Grow and Advance:

Repeated experiences of benign left out of meetings and not given decision making roles makes women feel underrepresented and ultimately frustrated with the workplace. Some obstacles identified in literature to women's professional growth include women feeling they are given less challenging assignments which is monotonous and limits their scope of growth. Some women also feel they are not given the same developmental opportunities as their male colleague or have time to evolve into a new role which is where they can learn skills and

42 https://www.britsafe.in/safety-management-news/2025/toilet-trouble-how-india-s-working-women-still-lack-suitable-facilities

43 https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2025.1474864/full

44 https://eudl.eu/pdf/10.4108/eai.18-12-2018.2283881

45 https://www.aon.com/getmedia/9d3efec7-69ed-478e-b896-558e4e5f894a/24293-Voice-of-Women-2024-Report-v6.pdf

46 https://timesofindia.indiatimes.com/blogs/equal-bytes/indias-skilling-blind-spot-why-women-are-missing-from-workforce-revolution/

47 https://economictimes.indiatimes.com/jobs/c-suite/negligible-number-of-women-cxos-at-indias-top-auto-cos-says-deloitte-study/articleshow/108244845.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

48 https://www.ijrti.org/papers/IJRTI2412024.pdf

49 Refer to 45

50 https://eudl.eu/pdf/10.4108/eai.18-12-2018.2283881

advance their contribution.[51] Certain times when women are hired into top positions or leadership roles, it is during a period of crisis, a phenomenon known as the glass cliff.[52]

6. Lack of Senior Women Leaders and Mentorship

In an Economic Times article Mr Harinder Singh, CEO and MD, Yokohama India notes that limited representation of women in leadership positions on the shop floor can make it challenging for female employees to find role models and mentors to support their career growth.[53] A Deloitte study found that 91 percent of the women believed that the automotive industry is biased toward men for leadership positions and approximately 47 percent of men surveyed agreed with this view as well.[54] Women's underrepresentation in executive positions prevents companies from benefiting from a diverse set of viewpoints, kills off creativity, and reinforces harmful gender stereotypes.[55]

Enablers to Female Participation in the Automobile Industry

To address the many deeply rooted barriers and challenges existing in the automotive sector, which are preventing more women from entering or progressing in the industry, several enablers have been identified in existing literature. These enablers highlight the need for proactive efforts and measures in the larger policy and operating environments of the companies, the industry and the state.

1. Providing Necessary Infrastructure

There is a need to improve the general infrastructure in workplaces such as well lit offices, clean and hygienic washrooms for women, sanitary disposal bins, feeding rooms etc. For women not working traditional office settings such as driving partners and gig economy workers, traveling long distances and working irregular hours in public spaces can be made possible by providing adequate clean public washrooms, water facilities, rest stops, changing rooms and safe public spaces to take breaks.[56] For women working in industrial parks and manufacturing clusters which are often remote, providing safe travel into the cities as well as hostel/accommodation near the factory can help retain female employees.[57] Having access to creches, affordable day care facilities near workplaces and appropriate locations can help women meet their caregiving obligations and expand women's participation in economic activities. Improving public transport to provide affordable and safe travel options can also boost employment of women and shrink the gender gap in work participation.[58]

2. Respect, Recognition and a Positive Work Environment

A supportive and equitable work environment can boost employee morale and performance. Avenues for employees to showcase their contributions and achievements, such as recognition programs, performance reviews, and leadership opportunities, can give employees the opportunity to showcase their contributions and help make them valued in the organisation.[59] A study observed that performance of men and women at work depended on different types of motivation. While the performance of men was higher in relation to monetary rewards, for women's performance

51 https://www.forbes.com/sites/joanmichelson2/2022/01/28/7-reasons-there-are-few-women-in-automotive-leadership--new-research/

52 https://hbr.org/2011/01/how-women-end-up-on-the-glass-cliff

53 https://auto.economictimes.indiatimes.com/news/industry/women-at-the-helm-of-auto-industry-challenges-and-opportunities/108270802

54 https://www.deloitte.com/content/dam/assets-zone3/us/en/docs/industries/energy-resources-industrials/2020/us-women-at-the-wheel-2020-executive-summary-final.pdf

55 https://www.researchgate.net/profile/Gajendra-Gupta-7/publication/378738521_Women_in_Leadership_How_to_Break_the_Glass_Ceiling_in_Business/links/65e74a99c3b52a1170163bbb/Women-in-Leadership-How-to-Break-the-Glass-Ceiling-in-Business.pdf

56 https://ifmrlead.org/wp-content/uploads/2025/02/Understanding-Safety-and-Mobility-Experiences-of-Women-Working-in-Public-Spaces-in-Chennai_Report_December-2024.pdf?utm_source=chatgpt.com

57 https://olawebcdn.com/ola-institute/Building_a_Gender_Inclusive_EV_Workforce_in_Telangana_Policy_Roundtable_Proceedings_Report.pdf

58 https://www.sciencedirect.com/science/article/pii/S1757780224001859

59 https://www.researchgate.net/profile/Toopalli-Sirisha/publication/383271159_Impact_of_Workplace_Environment_on_Employee_Performance_in_Tamil_Nadu_India_Automobile_Industry/links/66c5ba084b25ef677f728cdf/Impact-of-Workplace-Environment-on-Employee-Performance-in-Tamil-Nadu-India-Automobile-Industry.pdf

was valued more by non monetary benefits which includes decision making capacities, recognition and job security.[60]

A positive work environment should include provisions for basic infrastructure like clean washrooms, resting areas and safe offices as well as policies and programs that support work-life balance, such as flexible schedules, paid maternity leave, on-site childcare, and remote work options. To ensure safe and respectful work environments, companies can carry out sensitisation programmes and awareness sessions on creating safe and respectful work environments for all employees.[61] Zero tolerance to disrespect and harassment of any kind towards women must be met with strict rules warning, monetary fines, or termination.[62]

3. Breaking Societal Biases Through Community Engagement

Building community trust through active engagement with families of women and community members can help challenge social barriers, mitigate concerns on safety, and improve community acceptance. This can include engaging with families during the recruitment process, community awareness campaigns, and working with local leaders, NGO partners and government bodies who have a connection with the grassroots.[63]

4. Awareness Generation and Promotion of STEM Careers

To encourage women to join the automotive sector, we must tackle the issues at the root. Breaking the bias against women pursuing STEM fields and encouraging them to take interest in these fields must begin at a young age. Designing and creating targeted extracurricular programs, summer camps, and educational activities meant to engage girls and young women in STEM, and highlight the available career prospects can help increase gender diversity in the automobile industry.[64] Women need to also be made aware of the skilling, employment, entrepreneurial opportunities existing and emerging in the automobile field. For this, public awareness campaigns about skilling programmes at the grassroots level, career counselling and guidance for school children is also vital.[65]

5. Supporting Female Talent and Entrepreneurship

Collaboration between educational institutes and private companies can help acquire talent and the entry level and help female talent receive experience and exposure. Private sector automobile companies can partner with academic institutes and vocational schools to offer students practical opportunities, internships, research projects, on-the-job training, apprenticeships to train women and help them develop relevant industry skills.[66]

To support female entrepreneurs, existing literature suggests various recommendations such as establishing incubation centres in colleges in collaboration with EV sector players, accelerator programmes tailored for women-led startups, specialised support for women-led e-mobility companies such as government grants, preferential rates of borrowing or preferential procurement[67] and tailored loan products with flexible terms and low-collateral requirements for women entrepreneurs.[68]

6. Supporting Female Leaderships and Mentorship

Supporting the increase of women in leadership and top management positions can severely benefit the automobile industry as they can bring different perspectives, cater to women-specific

60 https://www.researchgate.net/publication/342252047_Cash_non-cash_or_mix_Gender_matters_The_impact_of_monetary_non-monetary_and_mixed_incentives_on_performance

61 https://www.sciencedirect.com/science/article/pii/S1757780224001859

62 https://eudl.eu/pdf/10.4108/eai.18-12-2018.2283881

63 https://olawebcdn.com/ola-institute/Building_a_Gender_Inclusive_EV_Workforce_in_Telangana_Policy_Roundtable_Proceedings_Report.pdf

64 https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2025.1474864/full

65 https://olawebcdn.com/ola-institute/ev-ready-feminising-ev-value-chain.pdf

66 Refer to 64

67 https://sustmob.org/EMOB/pdf/GenderEmobility_Report_August2024.pdf

68 Refer to 65

concerns and create a space where more women feel encouraged and welcome to join. Towards this, organisations and companies have a responsibility to help women break through barriers and create a conducive work environment. Investing in female leadership development programmes, equipping women with the information, skills, and confidence can help increase the representation of women in positions of power.[69]

Mentorship programmes in particular have been identified as an important mechanism for women leaders to be able to help female colleagues with career advice, guidance on advancing in their profession, solidarity of working in a male dominated field and instill confidence in them to continue in their journey.

7. Gender Sensitive and Gender Positive Policies

Gender sensitive and gender positive policies are those which address strategic gender-needs; promote shared power control over resources, decision-making and support for women's empowerment.[70] Within the industry, automotive companies must establish and follow gender equality policies such as fair hiring policies, merit-based promotions, and closing the gender pay gap, to reduce discrimination and promote equal opportunity in all business areas.[71]

In terms of government policies, there are many skilling programs and schemes as well as separate EV policies at the state level. Existing literature provides several recommendations to make these policies more gender positive to help support women in the automobile workforce. These include adopting gender-sensitive employment generation subsidies in state EV policies, providing subsidies for skilling, re-skilling, and up-skilling women-specific training initiatives in EV policies[72], capacity building and sharing methods to systematize gender mainstreaming in national, regional and local transport institutions, adopting gender-based targets in decarbonising transport policies[73], creating female skilling targets within ITIs and other skilling institutes, and state-led initiatives to provide digital access and literacy, provisions for financial inclusion and entrepreneurial skills to help increase female participation in the auto sector.[74]

3.5 Policy and Regulatory Landscape: A Gender Lens

India's policy framework for gender equality in the workforce reflects ambition, anchored by several flagship initiatives that provide the foundation for women's economic empowerment.

The government's commitment to achieving 70 percent female workforce participation by 2047 under the Viksit Bharat vision demonstrates policy ambition. Recent data indicates significant progress in female labor force participation rate (FLFPR), with the rate increasing from 23.3 percent in 2017-18 to 41.7 percent in 2023-24 according to the Periodic Labour Force Survey.[75]

Also, as latest as in October 2025, the Directorate General of Employment (DGE), Ministry of Labour and Employment came out with the draft policy on "Shram Shakti Niti 2025 - National Labour and Employment Policy of India".[76] This policy strives to create an inclusive and equitable workforce thereby enabling people-centric and planet-sensitive approach for economic growth. It translates this vision into action by adopting seven interlinked strategic objectives, one of which is 'Women and Youth Empowerment'. Towards this, the draft policy

69 https://www.researchgate.net/profile/Gajendra-Gupta-7/publication/378738521_Women_in_Leadership_How_to_Break_the_Glass_Ceiling_in_Business/links/65e74a99c3b52a1170163bbb/Women-in-Leadership-How-to-Break-the-Glass-Ceiling-in-Business.pdf

70 https://eugender.itcilo.org/toolkit/online/story_content/external_files/BB6.pdf

71 Refer to 64

72 https://olawebcdn.com/ola-institute/ev-ready-feminising-ev-value-chain.pdf

73 https://sustmob.org/EMOB/pdf/GenderEmobility_Report_August2024.pdf

74 https://cis-india.org/internet-governance/pdf-automotive-case-study

75 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2057970

76 https://labour.gov.in/sites/default/files/directorate_general_of_employment_1.pdf

sets a target of increasing women's participation to 35 percent by 2030.[77] One of the key features is the creation of Universal and portable social security accounts which will integrate Employees Provident Fund Organisation (EPFO), Employees State Insurance Corporation (ESIC), Pradhan Mantri Jan Arogya Yojana (PM-JAY), e-SHRAM, and the State welfare boards with a view to create unified social protection architecture.[78]

In addition to these overarching vision plans and policy directives aimed at increasing women's presence in the overall workforce, there are other broader policies which too support this by fostering an enabling environment such as Mission Shakti, Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM) (mobilising women into SHGs), Pradhan Mantri Mudra Yojana (issuing loans to women entrepreneurs), Pradhan Mantri Matru Vandana Yojana and more.

However, even with these broader and high-level ambitions, gaps in reality and implementation challenges persist even while some positive trends are being observed (e.g. increasing FLFPR).

Within the Automotive Industry

If we turn to the automobiles segment, despite India's large-scale transition from ICE to EVs and achievements towards the adoption of EVs, the sector as a whole has only a few achievements towards mainstreaming women's participation.

While the sector-specific policies have played a key role in the achievements so far, these policies have a blindspot for gender-specific ecosystem enablers. For instance, the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) scheme - both FAME-I[79] and FAME-II[80] have no mention of women and lack specific gender provisions. Also, the National Electric Mobility Mission Plan (NEMMP) 2020[81] and the new PM E-DRIVE Scheme[82] stays muted on it.

In all, while the overarching intent and willingness to increase women participation in the workforce persists in the government, the same does not reflect in the industry-specific policies which have been formed. This signals at siloed approaches and calls for better alignment of the sectoral policies with the broader government vision in place.

Also, NITI Aayog's latest India Electric Mobility Index (IEMI) lacks a metric on women/gender support for e-mobility too.[83] Adding this as a metric and integral component of the mobility index can bring the issue into policy focus and drive state policymakers to take action towards it.

On a closer look, similar gaps are also observed in some of the state EV policies as they too indicate limited gender integration. However, there are instances of targeted provisions in some of the state policies, for instance as highlighted below:

- **Odisha:** The state policy gives women entrepreneurs specific advantages in EV battery manufacturing by providing them preferential treatment under both MSME Policy 2016 and Startup Policy 2016.[84]
- **Jharkhand:** Likewise, in Jharkhand women entrepreneurs, if residents of the state, are entitled to an additional 5 percent benefit of capital subsidy (Comprehensive Project Investment Subsidy (CPIS)) as per the state's EV policy, 2022.[85]
- **West Bengal:** As part of skilling and training provisions, the policy specifies creating a cohort of women drivers as well as owners for 3-wheelers for enhancing last-mile connectivity.[86]
- **Tamil Nadu:** For providing transition support

77 https://labour.gov.in/sites/default/files/draft_-_mole_le_policy_-_v1.1.pdf

78 https://www.thehindu.com/news/national/draft-labour-policy-proposes-to-integrate-all-social-security-schemes/article70140320.ece

79 https://heavyindustries.gov.in/sites/default/files/2023-09/OM_FAME_India.PDF

80 https://fame2.heavyindustries.gov.in/content/english/11_1_PolicyDocument.aspx

81 https://heavyindustries.gov.in/sites/default/files/2023-07/NEMMP-2020.pdf

82 https://pmedrive.heavyindustries.gov.in/docs/policy_document/257594.pdf

83 https://iemi.niti.gov.in/dashboard/downloads

84 Provision 5.3.2. https://ct.odisha.gov.in/sites/default/files/2023-07/EV%20Policy%20-%202021%28Amended%202023%29_0.pdf

85 https://cleanmobilityshift.com/wp-content/uploads/2022/10/Jharkhand-EV-Policy-2022.pdf

86 https://evyatra.beeindia.gov.in/wp-content/uploads/2022/11/West-Bengal-Electric-Vehicle-Policy-2021.pdf

to automotive companies, the policy creates provision for upskilling allowance (up to 10 percent of their existing workforce working on the EV production line). It provides enhanced training subsidies of ₹6,000 per month (50 percent higher than the standard ₹4,000) for women employees transitioning from ICE to EV manufacturing, ensuring gender-inclusive workforce development in India's largest automotive export hub.[87]

Summarily, some of the aspects which can be covered in the policy framework to incorporate aspects of gender are differentiated incentives for vehicle purchase, employment targets for women in manufacturing or operations, training targets for women, training subsidies specifically targeting women, requirements for gender impact assessment of existing interventions or projects, and provisions for women entrepreneurs in the EV ecosystem.

87 https://investingintamilnadu.com/DIGIGOV/StaticAttachment?AttachmentFileName=/pdf/poli_noti/TN_Electric_Vehicles_Policy_2023.pdf

Part I:

Quantitative Survey Analysis

4

Insights from Surveys

4. Insights from Surveys

A primary survey of women engaged in the workforce was conducted to gather insights from the demand-side and supply-side of the EV ecosystem. In the backdrop of under-representation in the OEM shop floor, and male-dominance of on-road drivers, three key women stakeholder segments were identified - EV OEM workforce, EV users in the gig economy, and EV owners (current and prospective). Details of the survey participants have been captured in Table 2. This section captures key insights from the survey exercise categorised through the STEEP framework for each of the segments.

Table 2: Survey participants' profile

Sl. No.	Stakeholder Group	Description	Number of Relevant Companies Surveyed	Number of Survey Participants
1	**EV OEM Workforce**	Women participants engaged in the shop floor of EV OEMs. Participating OEMs included two-wheeler, three-wheeler, and electric truck manufacturers.	3	178
2	**Gig Economy Workforce**	Women participants in the gig economy engaged with prominent fleet operators as driving partners. The driving partners surveyed operate two-wheelers and three-wheelers within city limits.	3	86
3	**Women EV Owners**	Current and prospective EV owners were gauged on the factors that influence and impact their usage and purchase decisions.	Not Applicable	92

4.1 Women in EV Manufacturing

Women engaged in the shop floor of EV OEMs were surveyed to understand the various attributes that enabled their participation, and identify areas for improvement to encourage further participation from women. Fourteen parameters were identified to gather insights. They inform the pillars of the STEEP framework as observed in Table 3.

Table 3: STEEP parameters for women in EV manufacturing survey

Social	▪ Family support ▪ Organisation support towards domestic responsibilities
Technological	▪ Physical effort ▪ Machines and on-site equipment
Ecological	▪ Precedence of working in automobile industry ▪ Safety arrangement ▪ Protective equipment ▪ Clean toilet facilities ▪ Workplace environment
Economic	▪ Pay disparity ▪ Career growth
Political	▪ Source of skilling ▪ Policies of organisation ▪ Job availability for women

Social Parameters

Family Support

Respondents were surveyed to understand the nature and extent of support received from their immediate family that facilitates their participation in the workforce. This aspect is particularly significant, given that domestic responsibilities continue to be one of the primary barriers preventing women from engaging in formal employment. As illustrated in Figure 11, an overwhelming 99 percent of respondents reported having a supportive family environment. This finding underscores the critical role of familial support in easing domestic responsibilities and enabling women to pursue and sustain their professional responsibilities.

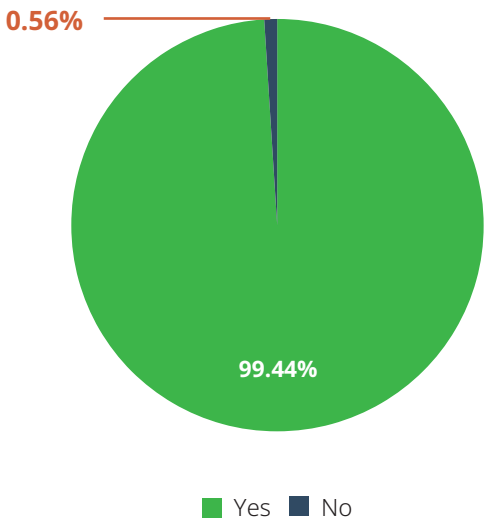


Figure 11: *State of family support for career*

Organisation support towards domestic responsibilities

Given that domestic responsibilities continue to disproportionately fall on women, the survey also assessed the extent of support extended by their respective organisations in accommodating these responsibilities. As shown in Figure 12, a significant 94 percent of respondents reported having supportive management that demonstrates flexibility toward balancing work and domestic obligations. This finding highlights the growing recognition among employers of the need to create an enabling and gender-sensitive work environment that allows women to effectively manage both professional and household responsibilities.

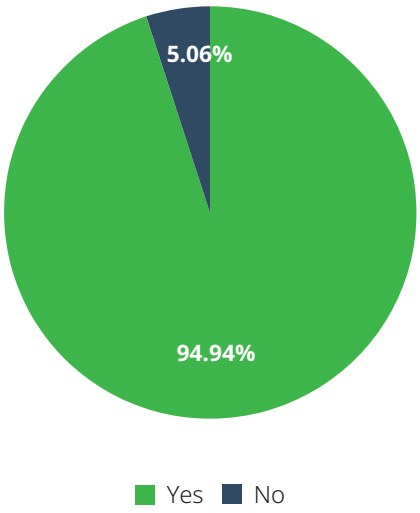


Figure 12: *Organisation support to manage domestic responsibilities*

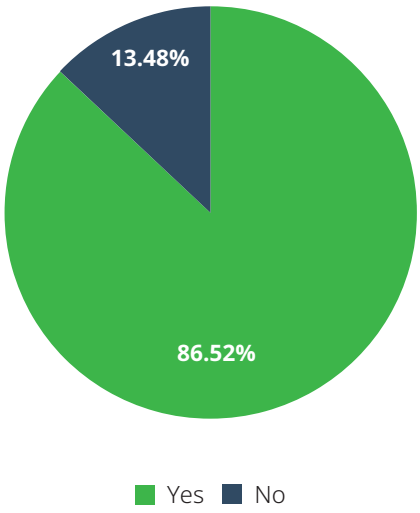


Figure 13: *Percentage share of women indicating manageable physical nature of their jobs*

Key Inference: Women participation relies heavily on the domestic and organisational-level support extended to employees. The high satisfaction levels among the women workforce on the social parameters is a departure from the trends in the automotive sector, and reaffirms the EV sector's potential to instill a gender-inclusive workforce.

Technological Parameters

Physical Effort

A long-standing narrative within the automobile sector has been that jobs, particularly those on the shop floor, are physically demanding and thus unsuitable for women. This perception has historically limited women's participation in the industry. However, with the advent of electric vehicles (EVs) and the resulting shift in manufacturing processes and component design, the focus has increasingly moved from physical labour to technical skill requirements. As illustrated in Figure 13, a substantial 86.52 percent of respondents reported that their jobs are not physically taxing, indicating a significant shift in the nature of work and an opportunity to foster greater gender inclusivity in the evolving EV ecosystem.

Machines and On-site Equipment

Advancements in technology and mechanisation of equipment in the assembly line, coupled with the increase in manufacturing of electronic components for EVs, have transformed the manufacturing facet of the automobile sector from being labour-intensive to skill-intensive. This shift has not only redefined the nature of work but has also encouraged a more gender-inclusive outlook within the industry. Reflecting this transition, the survey findings as observed in Figure 14 reveal that over 71 percent of respondents consider the machines and on-site equipment to be easy to operate, underscoring the growing accessibility of technical roles for women in the evolving mobility landscape.

86.52%

women report their jobs to not be physically taxing with 71 % indicating machines and on-site equipment to be easy to operate.

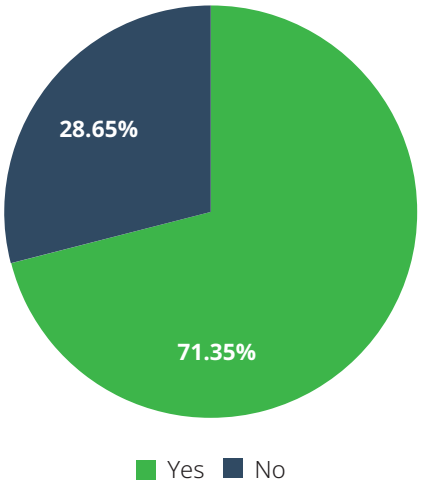


Figure 14: *Ease of use of machines and on-site equipment*

Key Inference: From a technological standpoint, electric vehicle (EV) manufacturing is increasingly becoming skill-oriented, with reduced physical demands that make the nature of work more gender-neutral and inclusive.

Ecological Parameters

Precedence of Working in Automobile Industry

The EV sector has the potential to attract new workforce. As observed in Figure 15, 82 percent of the respondents have no precedence of working in the automobile sector.

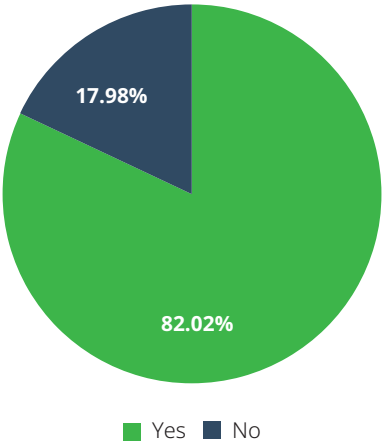


Figure 15: *Share of respondents with precedence of working in the automobile industry*

Safety Arrangement

100 percent of the respondents indicated satisfactory safety arrangements in the workplace and raised no concerns that could potentially deter their continuation in the sector. Provisions such as adequate lighting, and monitoring cameras/CCTVs have instilled confidence among the workforce.

Protective Equipment

The respondents were gauged on their satisfaction with regard to the protective equipment provided on the job. While 70 percent of the respondents expressed satisfaction with the size adaptability and grade of the equipment as observed in Figure 16, the survey indicates scope for further customising the protective overalls, gloves and helmets to suit female-oriented sizes and body types.

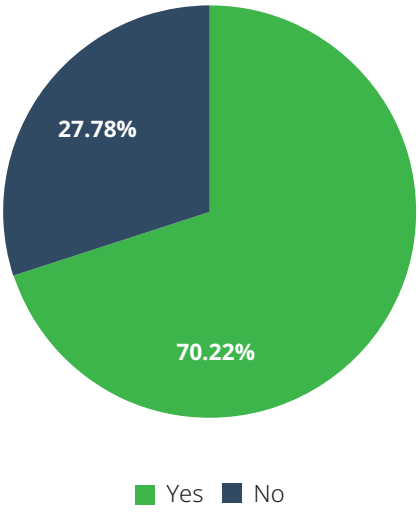


Figure 16: *Percentage share of respondents satisfied with the provided protective equipment*

Clean Toilet Facilities

Access to clean toilet facilities at the workplace was gauged among the survey respondents. As observed in Figure 17, over 92 percent of the respondents expressed a satisfactory presence of toilet facilities commensurate with the strength of the female workforce. However, the remaining 8 percent of the respondents indicated that while the toilet facilities were present, there was room for improvement in their standard.

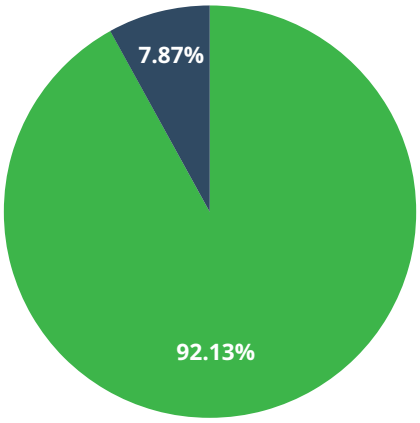


Figure 17: *Satisfactory presence of clean toilet facilities*

Workplace Environment

As observed in Figure 18, 98.31 percent of the respondents indicated that the overall work environment was deemed suitable for women employees. A small section of the respondents expressed dissatisfaction with the management, but were broadly satisfied with the facilities available at their place of work.

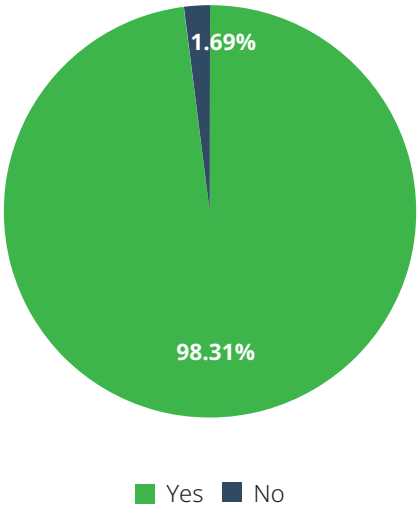


Figure 18: *Satisfaction with workplace environment*

~40%

respondents indicate limited career advancement opportunities in the sector."

Key Inference: The EV sector accommodates a gender-neutral workforce with the facilities and environment suited to encourage participation of women. However, the design of protective equipment needs to be re-examined through a gender lens. Traditional equipment is primarily designed considering an all-male workforce.

Economic Parameters

Pay Disparity

Historically, the women workforce has been underpaid in comparison to their male counterparts. In this regard, the incidence of pay disparity in the EV sector was gauged as shown in Figure 19. While 11.24 percent of the respondents indicated that pay disparity is present in their organisation, the majority indicated the absence of such economic discrimination. This is a positive trend and reaffirms the potential of upcoming sectors such as the EV industry in encouraging women's participation.

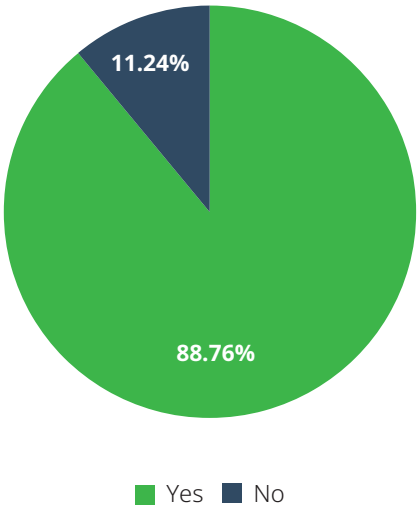


Figure 19: *Presence of pay disparity among male counterparts for similar roles*

Career Growth

The survey also examined the perceived opportunities for career growth within the EV manufacturing industry. As shown in Figure 20, a considerable 30.9 percent of respondents indicated that opportunities for career advancement in the sector remain limited. This perception is largely attributed to the highly skill-specific nature of many roles, which often restricts upward mobility

without additional training or certification. While some respondents acknowledged the availability of in-house training facilities for upskilling, a broader gap in access to structured and inclusive training programs persists across the industry. Addressing this gap through targeted capacity-building initiatives could significantly enhance career progression pathways and strengthen workforce retention in the EV manufacturing sector.

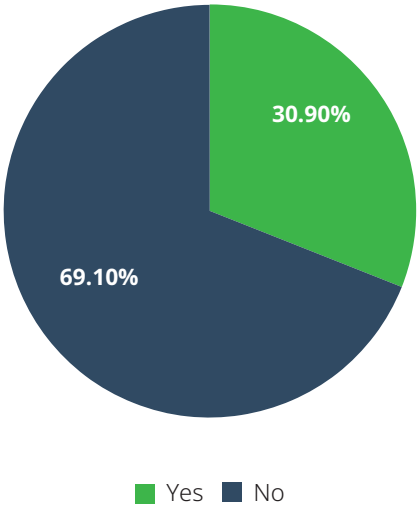


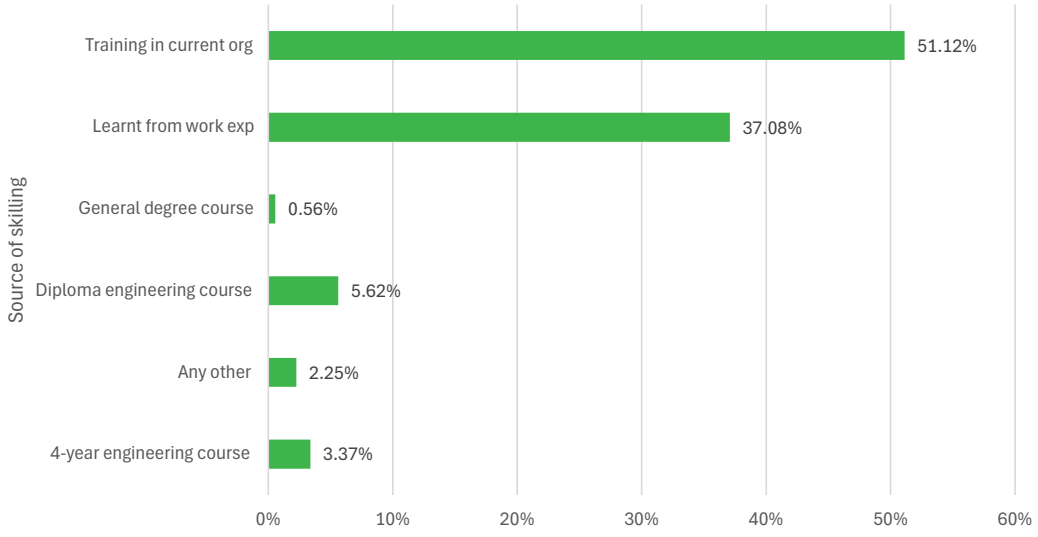
Figure 20: *Percentage share of respondents indicating limited career growth opportunities*

Key Inference: Career progression of women is dependent on their access to upskilling and training avenues. Targeted capacity-building initiatives are key to supporting career progression among women and improving their retention in the EV workforce.

Political Parameters

Source of Skilling

Given the prominence of skill-based roles in the EV manufacturing industry, the study also examined the sources of skilling among respondents. As illustrated in Figure 21, a majority—over 51 percent—of respondents identified employer-provided training as their primary source of skill acquisition. Additionally, around 37 percent reported relying on prior work experience to develop the competencies required for their current roles. A smaller proportion of women respondents indicated that formal degree programs had equipped them with the necessary technical skills. These findings highlight the critical role of industry-led training and experiential learning in building the EV workforce, while also suggesting the need to strengthen institutional skilling pathways to ensure broader accessibility and inclusivity.



Employer provided training is a major source of skill acquisition for these women

Figure 21: *Source of skilling*

Policies of Organisation

The respondents were gauged on their satisfaction concerning the policies of their organisation, and whether they deemed the policies suitable for a woman workforce. As observed in Figure 22, over 93 percent of the respondents indicated satisfaction with the organisation policies. Owing to the formal nature of jobs, the policies were largely suited to a gender-neutral workforce. This concurs with the satisfaction of the majority of the respondents on the organisations being accommodative of their domestic responsibilities.

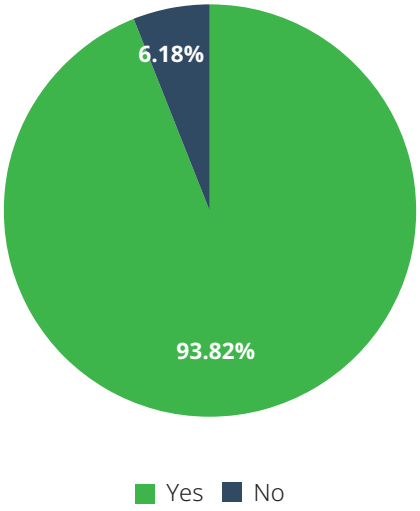


Figure 22: *Compatibility of organisation policies for a woman workforce.*

Job Availability for Women

The overall availability of jobs for women in the EV manufacturing industry was gauged. As observed in Figure 23, 44.38 percent of the respondents indicated that there is a scarcity of jobs in the sector for women. This prompts further enquiry into the hiring practices, and skill requirements of companies to address this gap in the growing industry.

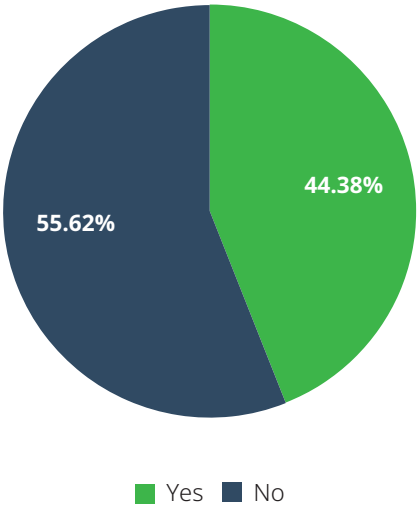


Figure 23: *Scarce job availability for women*

Key Inference: Training and skilling opportunities appear to be concentrated in-house. There is a need to provide access to upskilling programs that boost career growth and set up more avenues for training and facilitating women induction in the sector's workforce. Additionally, regulations that promote hiring of women must be instituted in the industry to increase job opportunities.

4.2 Women Driving Partners – Gig Economy

Women engaged as driving partners in the gig economy were surveyed to understand the various attributes that enabled their participation, and identify areas for improvement to encourage further participation from women. The status of the public EV infrastructure, vehicle operation modalities, ecosystem barriers, and enablers were gauged through thirteen parameters to gather insights. They inform the pillars of the STEEP framework as observed in Table 4.

44.38%

women indicated scarcity of jobs in EV manufacturing sector

Table 4: STEEP parameters for women driving partners – gig economy

Social	▪ Hostility from male driving partners on-road ▪ Harassment from passengers ▪ Family support
Technological	▪ Training provision ▪ Charging infrastructure availability concerns ▪ Physical effort
Ecological	▪ Precedence of driving partner profession ▪ Availability of safe parking spaces ▪ Access to toilet facilities during work hours ▪ Job flexibility to manage domestic responsibilities ▪ Night driving safety restrictions
Economic	▪ Vehicle financing challenges
Political	▪ Challenge obtaining licenses

Social Parameters

Hostility from Male Driving Partners On-road

Roads have traditionally been dominated by male drivers. In this backdrop the driving experience of respondents, specifically the reception from other male driving partners, was gauged. As observed in Figure 24, over 60 percent of the respondents reported incidents where they faced unprovoked hostility from the male driving partners. Further, the respondents reported resistance to their joining of driving partner unions, which restricts their access to transport hubs which are usually dominated by such entities. This reflects a stigma towards the presence of female driving partners.

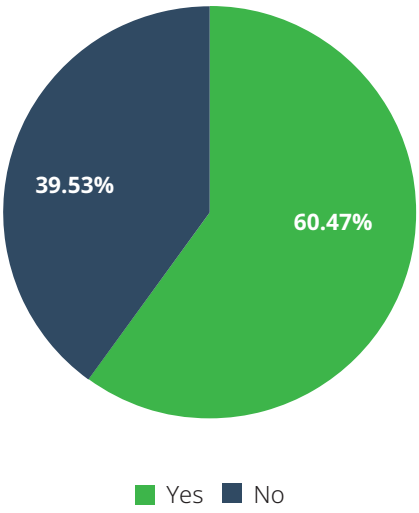


Figure 24: *Percentage share of respondents facing on-road hostility from male counterparts*

Harassment from Passengers

The attitude of passengers towards the woman driving partners was gauged. As observed in Figure 25, 39.53 percent of the respondents indicated being at the receiving end of harassment from passengers. The respondents conveyed that the incidents occurred primarily by virtue of their gender, and that the situation would have not been the same for male driving partners. An intrinsic bias by the passengers towards female driving partners was noted in these unprovoked cases.

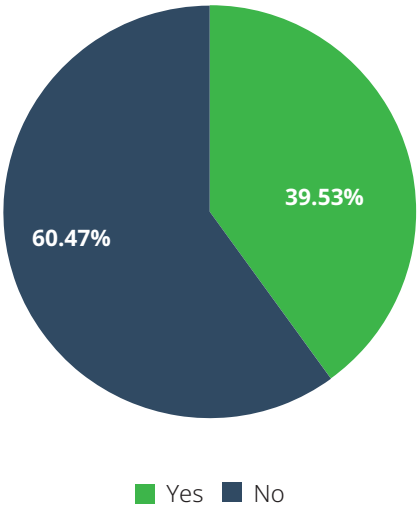


Figure 25: *Percentage share of respondents who faced harassment from passengers*

60%

of women reported facing incidents of unprovoked hostility from male driving partners

Family Support

Respondents were surveyed on the acceptance of their families and the support extended towards their profession. As observed in Figure 26, over 93 percent of the respondents indicated that their family supported their decision to take up the driving profession. In some cases, respondents conveyed that they were separated from their families, and the driving profession has provided them with a source of income.

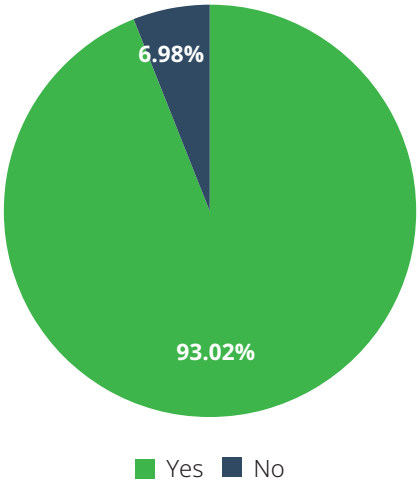


Figure 26: *Percentage share of respondents indicating family acceptance to their profession*

Key Inference: Women driving partners emboldened by EVs are able to partake in the gig economy. However, stigma from male counterparts and instances of harassment from passengers by virtue of the driving partner's gender persist.

Technological Parameters

Training Provision

Given that EVs are technologically different, and operational facets such as charging process necessitate knowledge transfer, the respondents were gauged on the extent of training provided to support their induction in the sector. As observed in Figure 27, over 98 percent of the respondents received training on the aspects of driving practice, mobile application usage, service and repair protocols, and customer service protocols.

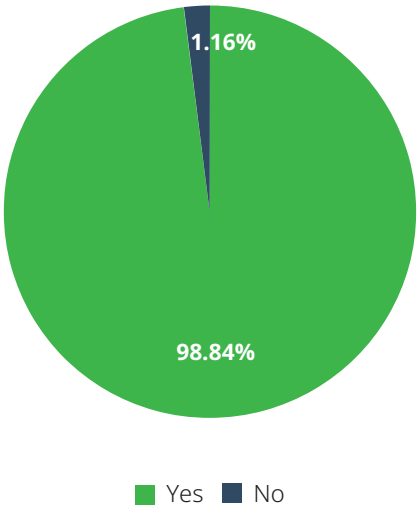


Figure 27: *Percentage share of respondents who received training*

Charging Infrastructure Availability

Availability of charging infrastructure is a common concern among the public with regard to EV adoption. As EV driving partners, the respondents were gauged on their concerns regarding the availability of charging infrastructure. As observed in Figure 28, around 57 percent of the respondents indicated that availability of charging infrastructure is a concern when they are operating in areas that are distant from their regular charging hubs or homes.

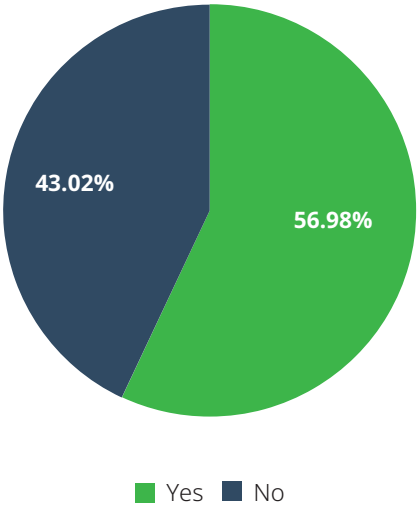


Figure 28: *Concerns with charging infrastructure availability*

Physical Effort

Respondents were gauged on the physical toll of driving EVs. As observed in Figure 29, over 90 percent of the respondents indicated that the physical demands of the professions were manageable, and expressed ease of driving attributed to EVs.

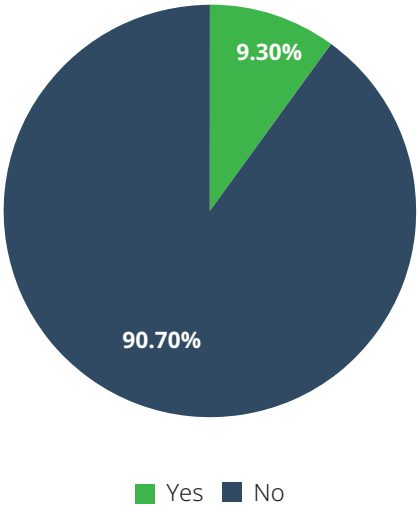


Figure 29: *Respondents indicating physical exertion of driving EVs*

Key Inference: EVs are an easy to use proposition enabling increased women's participation in the sector. Training support by the organisations is critical in facilitating their induction. Technical support is necessary to aid in the location of functional charging stations.

Ecological Parameters

Precedence of Driving Partner Profession

Respondents were gauged on their prior experience with driving as a profession. As observed in Figure 30, over 95 percent of the respondents indicated that their current organisation is the first instance of them working as driving partners, and relied on the training support extended by their company to learn driving. This reflects the ease-of-operation associated with EVs enabling jobs for women.

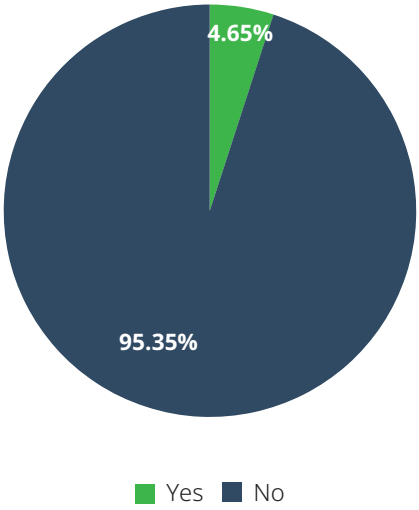


Figure 30: *Precedence of driving profession among respondents*

Availability of Safe Parking Spaces

As observed in Figure 31, the majority of the respondents (87.21 percent) indicated that finding safe parking spaces was not a concern. However, they did raise concerns over safety of the vehicle when parked at night at home. Lack of dedicated parking spaces, forces on-road parking leading to safety concerns. Some respondents conveyed that they preferred leaving their vehicles at the company's charging hub overnight.

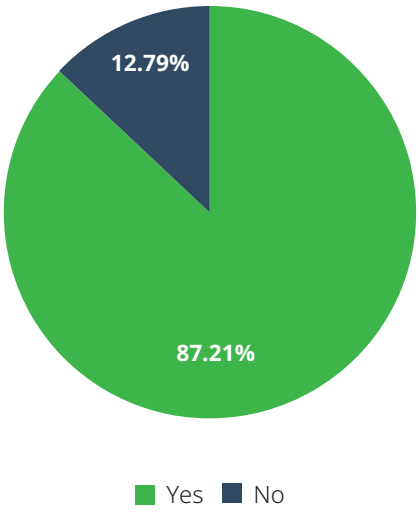


Figure 31: *Availability of safe parking spaces*

Access to Toilet Facilities During Work Hours

Respondents were gauged on the challenges faced in accessing clean and safe toilet facilities during work hours. As observed in Figure 32, the majority of the respondents (60.47 percent) indicated issues with accessing clean public toilets during work hours. They currently rely on their peer network to inform them of certain facilities in their usual areas of operation which are deemed usable, and the driving partners tend to travel to these specific locations to access toilet facilities.

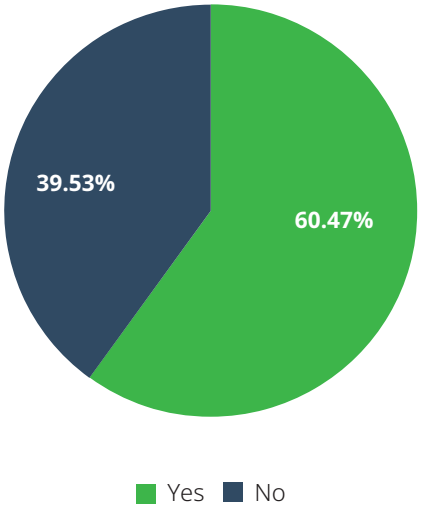


Figure 32: *Challenge in accessing toilet facilities during work hours*

Job Flexibility to Manage Domestic Responsibilities

Respondents were gauged on the flexibility provided by their jobs to manage domestic responsibilities. As observed in Figure 33, over 93 percent indicated that they are able to comfortably manage domestic responsibilities along with their job. Most respondents indicated that they work in shifts during the day to cater to coincide with the peak demand time, which provides flexibility.

65%

of women terminate work by 10pm due to safety concerns while night driving.

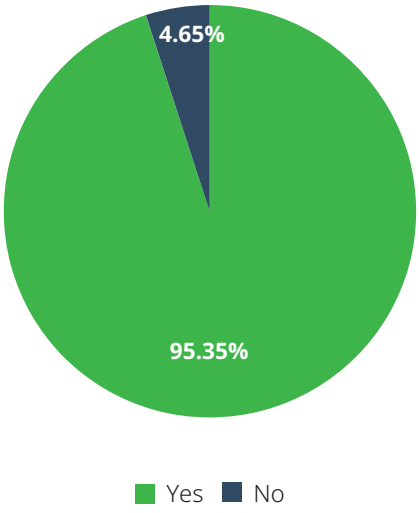


Figure 33: *Job flexibility to manage domestic responsibilities*

Night Driving Safety Restrictions

Respondents were gauged on their concerns with night driving and if they deemed it safe. As observed in Figure 34, the majority of the respondents (65.12 percent) indicated that they are cautious of night driving, and tend to terminate work for the day by 10pm. Some respondents indicated that they ventured into night driving to make up for the day's wage target by operating in groups in the same area.

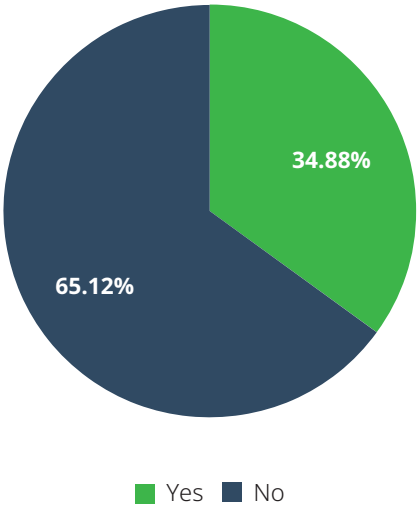


Figure 34: *Percentage share of respondents indicating safe night driving*

Key Inference: EVs have been an enabler in empowering women to participate in the gig economy. Concerns around safe public facilities – toilets, and parking spaces, need to be addressed for the women participants. Measures to ensure safety at night for women participants will expand their operational window thereby providing them with higher flexibility.

Economic Parameter

Vehicle Finance challenge

Respondents were gauged on the challenges to ownership of EVs that enable their participation in the gig economy. As observed in Figure 35, over 86 percent of the respondents indicated that there are limited options available to women for financing their EVs. Major barriers include the requirement of collateral for the loans, which women are unable to provide.

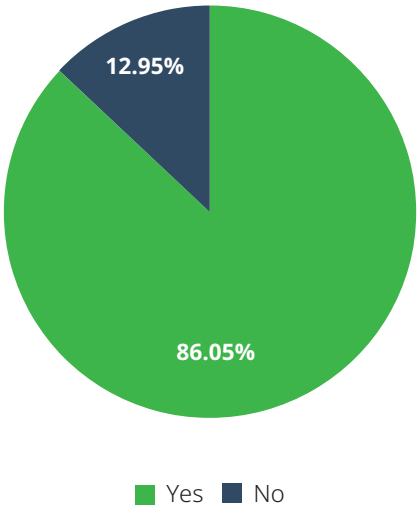


Figure 35: *Challenge in financing vehicles*

Key Inference: Obtaining ownership of EVs empowers women participating in the sector, providing them flexibility of operation, and stability in income. There is a need to develop a financial arrangement that provides collateral-free loan access to women.

Political Parameter

Challenge Obtaining Licenses

Respondents were gauged on the regulatory hurdles faced concerning their operation. As observed in Figure 36, over 72 percent of the respondents indicated a challenge in obtaining their driving license, given that the majority of the workforce constitutes first-time drivers. Respondents conveyed that paying additional fee to an agent to facilitate the process has become mainstream, and requested support in obtaining clearances through the formal approach.

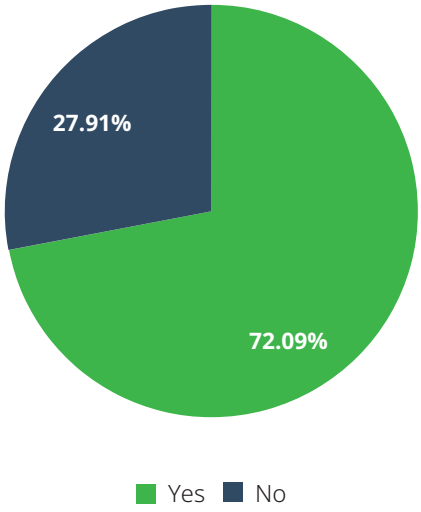


Figure 36: *Challenge obtaining licenses*

Key Inference: Further study is warranted on the specific regulatory barrier to obtaining licenses surrounding documentation and other requirements, to streamline the process and enable easy access to encourage women participation.

Financial and regulatory barriers hinder ownership and employment, with

86% **citing limited financing options and**

72% **facing licensing challenges.**

4.3. Women EV Ownership and Use

To gather demand-side insights, women were surveyed on the factors that influence their decision to purchase EVs, expectations from the ecosystem, and other barriers that prevent their adoption of EVs. Five parameters were identified which had multiple facets of the STEEP framework embedded in each, rendering a cross-themed analysis. The attributes of the STEEP framework mapped to each parameter is observed in Table 5.

Table 5: STEEP attributes mapped to demand-side parameters

Parameter	Social	Technological	Ecological	Economic	Political
Prior experience of driving an EV	■		■		
Priority factors - Local driving			■		■
Priori factors - Outstation travel		■	■		■
Priori factors - EV Purchase	■	■	■	■	■
Charging Station Use		■	■		■

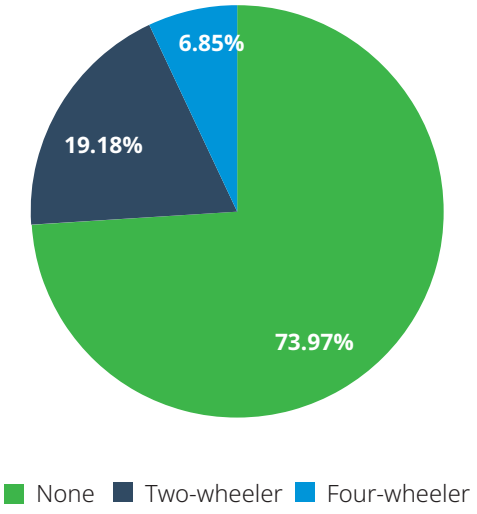


Figure 37: *Percentage share of respondents with prior EV driving experience*

Prior Experience of Driving an EV

Respondents were gauged on their access to an EV and if they have experienced driving an EV. As observed in Figure 37, over 73 percent of the respondents have never driven an EV. Around 19 percent of the respondents have had access to electric two-wheelers, and a minor share of 6.8 percent of the respondents indicated that they have driven an EV car. This reflects social realities where vehicle ownership has predominantly been male-dominated. Given the precedence of women drivers on-road has been low, this permeates stereotypes limiting access to women. To promote EVs among women, accessibility of vehicles must improve to provide targeted first-hand driving experience from an ownership standpoint. This will also serve as a way to address pre-conceived notions on the ecosystem challenges of owning an EV.

Priority factors - Local Driving

To understand the major concerns of women related to driving as a whole, the respondents were asked to rate the significance of factors that would influence their decision while driving in their local area. A mix of ecological factors such as road conditions, weather conditions, and availability of parking were assessed. As observed in Figure 38, availability of parking and road conditions were the top factors of concern. Presence of street lighting, road security, and traffic were also major factors influencing their decision to drive. Some of these factors can be addressed through political will and introducing regulatory measures to ensure that roads are well-lit, and parking policies plan for adequate spaces corresponding to the vehicle footfall in a certain area. The time of day consideration is prevalent primarily among women drivers which arises from security concerns, and warrants government intervention to instill confidence among women drivers. In the context of enabling livelihoods of groups such as women driving partners in the gig economy, this aspect becomes crucial.

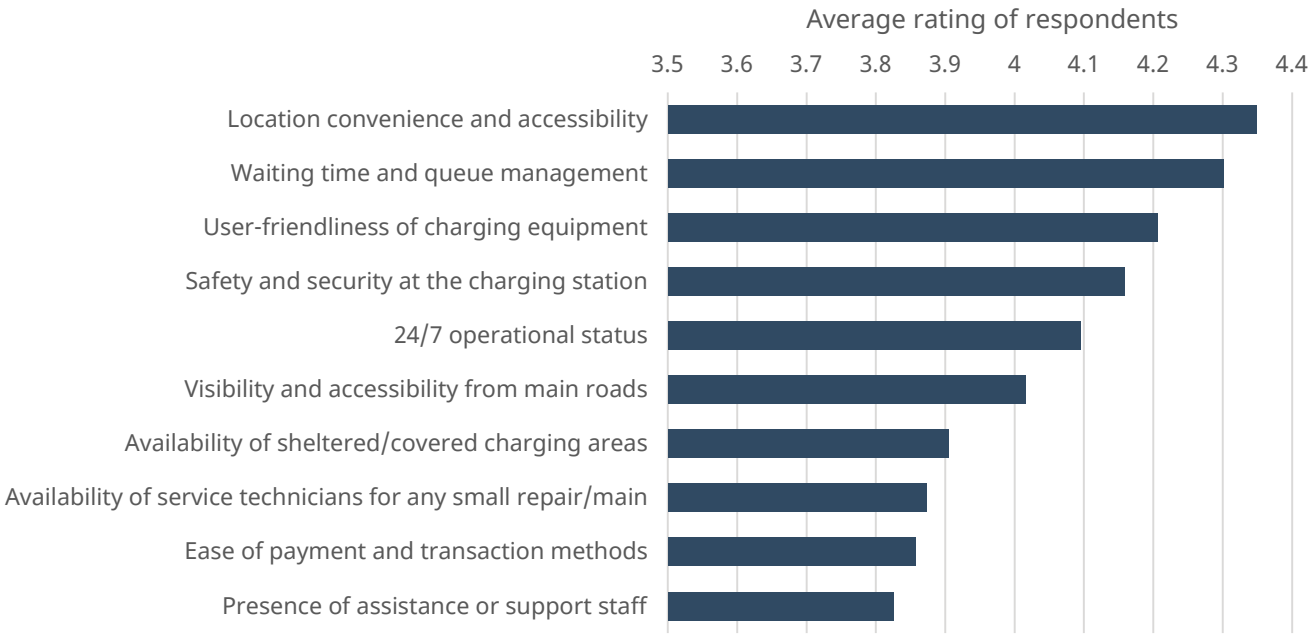


Figure 38: *Average rating of respondents indicating priority factors while considering local driving*

Priority Factors - Outstation Travel

To understand the major concerns of women drivers undertaking outstation travel, the respondents were asked to rate the significance of factors that would influence their decision. A mix of ecological factors such as road conditions, and well-maintained road-side public amenities were assessed. Technological factors include the availability of charging stations enroute and the efficacy of on-road breakdown assistance.

As observed in Figure 39, quality of roads and safety of route is the leading consideration while undertaking outstation travel. Availability of charging stations and emergency services were other major factors of significance. Reputation and reliability of the charging stations was given equal emphasis as the availability of the charging stations. Well-maintained rest stops and public amenities are other important factors for consideration.

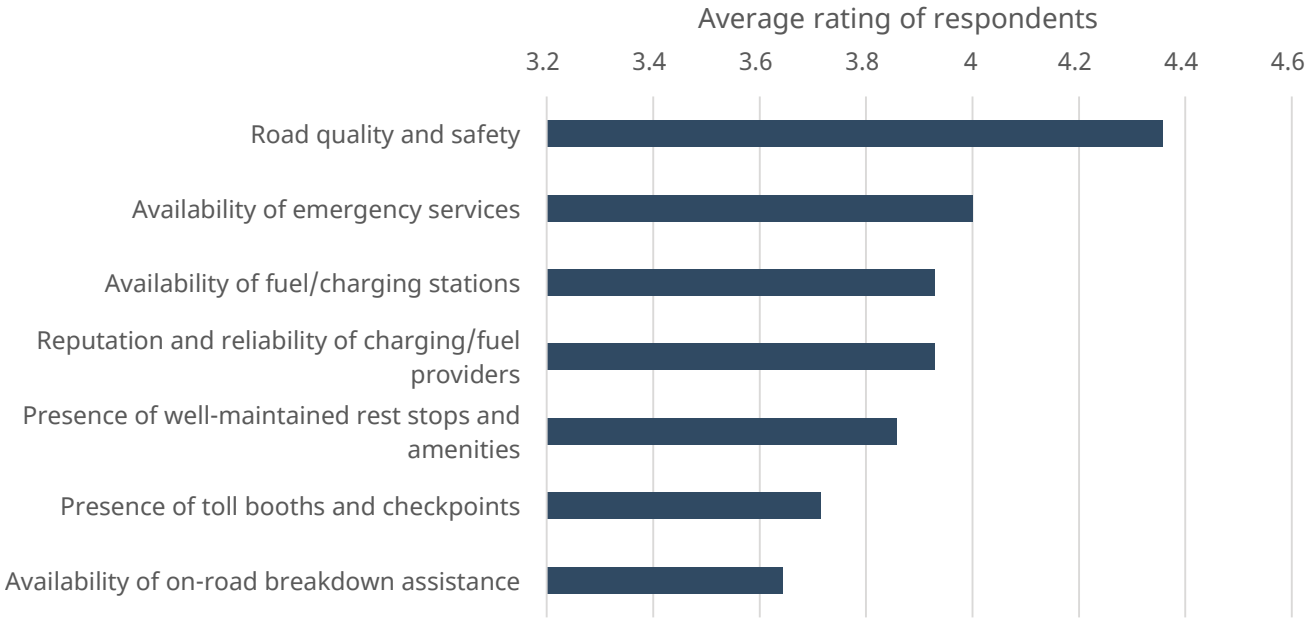


Figure 39: *Average rating of respondents indicating priority factors while considering outstation driving*

Priority Factors - EV Purchase

To begin with, women have limited say in the decision-making of vehicle purchase in general. Merely 23% of the survey respondents mentioned that they take the vehicle purchase decision by themselves. While parents emerged as the leading decision makers (36%) for a vehicle purchase, spouses too dominated this decision-making with its share (23%) being equal to that of decisions taken by females on their own.

To understand the major factors that influence ownership of EVs among women, the respondents were asked to rate the significance of corresponding factors. Cumulatively, these factors pervade all pillars of the STEEP framework. As observed in Figure 41, the charging and service ecosystem of EVs was deemed the most significant factor. Concomitantly, the availability of public charging stations, concerns about charging time and convenience, and availability of roadside assistance were among the highly significant factors. Economic factors such as the high upfront cost and concerns about battery life and replacement costs, were also given high significance in determining purchase decisions. Factors such as daily usage and resale value were observed to be relatively lower in significance. Social factors such as peer recommendations also held value in making purchase decisions, although lower in comparison to the other factors.

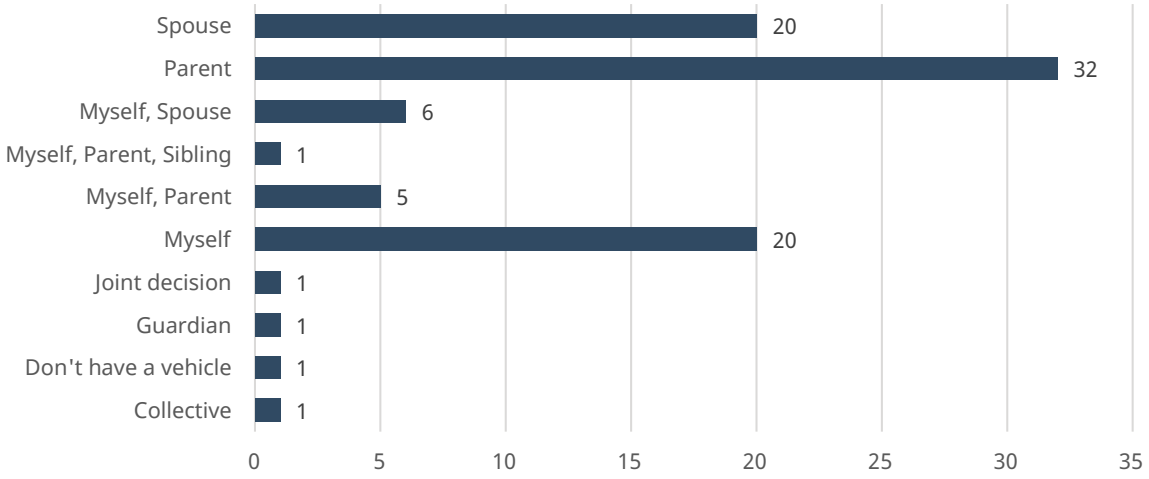


Figure 40: *Decision-maker for Vehicle Purchase*

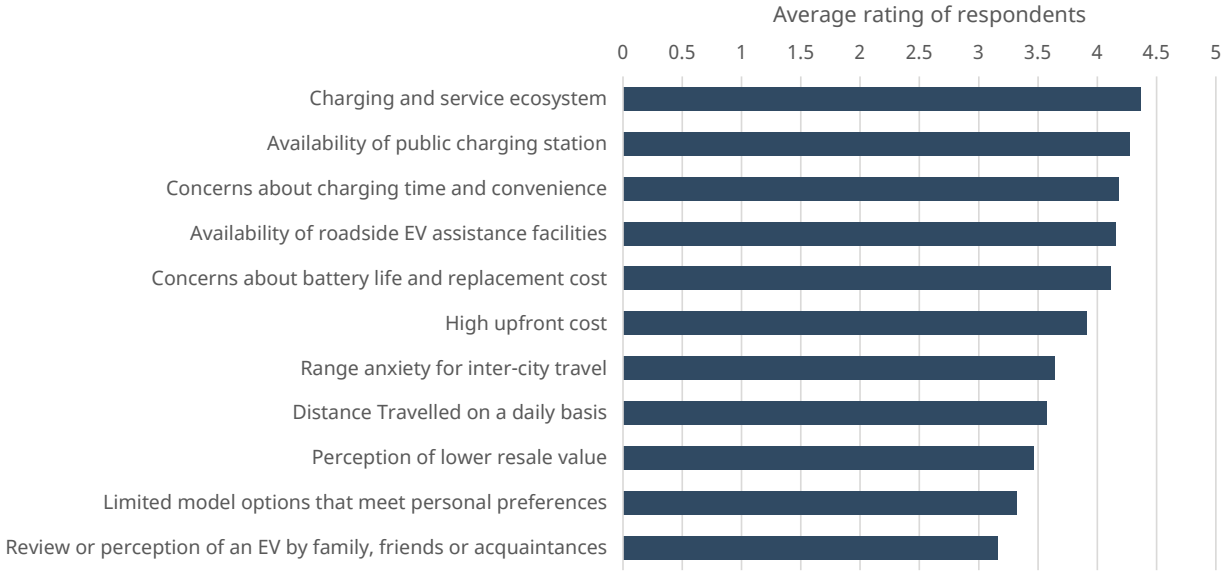


Figure 41: *Average rating of respondents indicating priority factors while considering EV purchase*

Priority factors - Charging Station Use

Respondents were gauged on the significance of various technological and ecological factors concerning charging stations and its usage. As observed in Figure 42, accessibility and convenience of the charging station location was the highest rated factor for using charging stations. Related technological factors such as queue management, user-friendliness of charging equipment, and round-the-clock operational status of the charging station were highly significant to the respondents. Ecological factors such as safety and security at the charging station, and visibility from the main roads, were also given significant ratings as supportive factors to use the charging stations. Economic factors such as ease of payment and transaction methods available were also deemed significant, although rated relatively lower in comparison to the other factors.

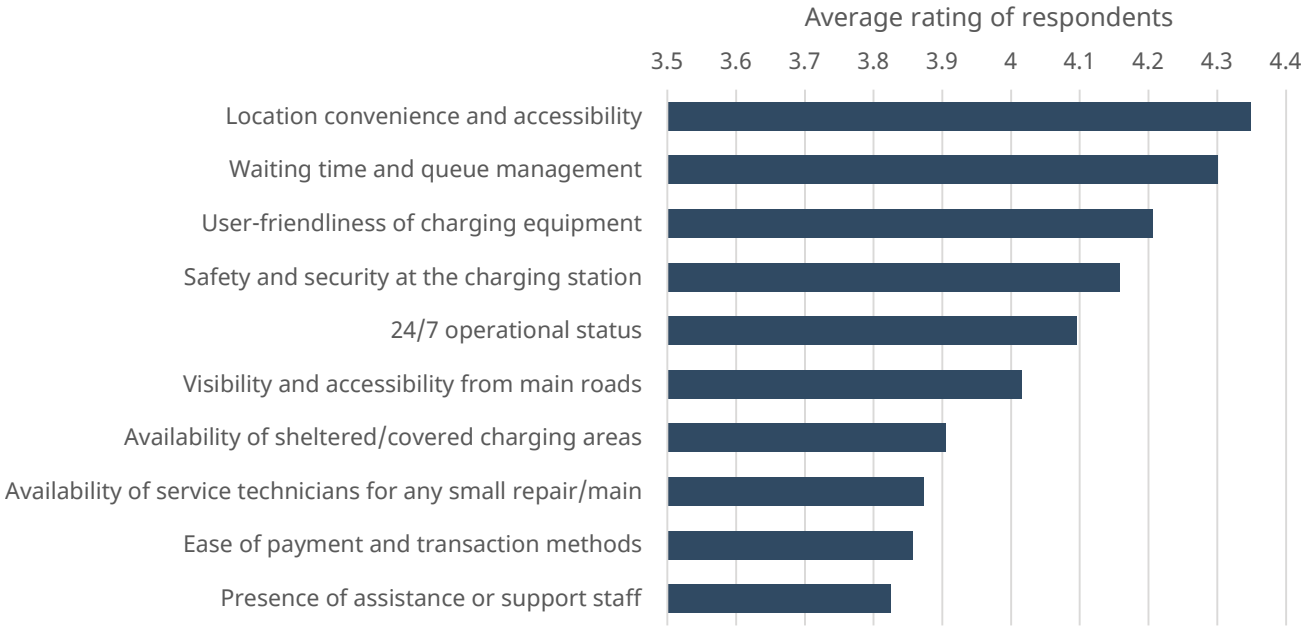


Figure 42: *Average rating of respondents indicating priority factors for use of charging station*

Key Inferences:

- Increasing avenues for women to experience first-hand driving of vehicles impacts their decision to purchase EVs.
- Round-the-clock road safety is an overarching concern for women drivers. This has critical implications in the context of impacting women who depend on driving for their livelihoods.
- Well-maintained rest stops with public amenities and good road conditions boost women's confidence to undertake outstation driving. Apart from availability of charging stations, reputation and reliability of charging stations is a key consideration.
- Robust charging and service ecosystem of EVs is key to promoting purchase of EVs among women. This includes providing real-time availability of reputed and reliable charging stations, along with on-road breakdown assistance.
- High upfront costs of EVs indicates a financing challenge for women to purchase EVs, warranting innovative financial instruments to support their purchase decisions.
- Accessibility, convenience and safety of using charging stations are the most significant factors influencing use of charging stations among women. Easy payment methods were another notable factor influencing charging station use.

Part II:

Qualitative Case Studies

5

Women in Focus: Case Studies from the EV Ecosystem

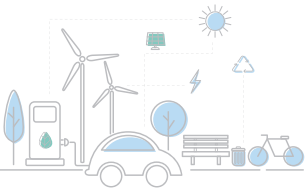
5. Women in Focus: Case Studies from the EV Ecosystem

In addition to the quantitative analysis, the study includes a series of in-depth case studies featuring women actively engaged in the automobile and EV ecosystem. These participants range from entrepreneurs and employees to professionals supporting other women in entering and advancing within the industry. The case studies are based on detailed interviews conducted across organizational hierarchies, including C-suite, mid-level, and entry-level roles, providing a comprehensive perspective on women's experiences across the value chain.

These case studies provide rich, ground-level insights into the working environment, highlighting the unique challenges women encounter, including financial constraints, societal expectations, safety concerns, and gaps in education or technical qualifications. Beyond identifying these barriers, the women shared valuable perspectives on practical solutions and changes they believe are necessary to foster greater inclusion. Their experiences and recommendations offer actionable guidance for enhancing women's participation across the EV value chain and shaping a more equitable and supportive ecosystem.

Figure 42: *Interviews conducted across C-suite, mid-level, and entry-level roles*

Case Study:
Namma Yatri



5.1 Women in the Gig Economy

1. Basic Information:

Organizational Hierarchy:
Mid-level

Job Title:
Manager

About the Organization:

Namma Yatri is an app-based riding-platform where auto drivers can subscribe and conduct auto rides in the city. This case study goes into detail of a program run by Namma Yatri to train and employ women auto-rickshaw drivers.

2. Journey Map:

Entry

Under the driver welfare section, Namma Yatri observed that there were very few female drivers on the app. This led to the establishment of a dedicated training program for women drivers- the Mahila Shakti Electric Auto Driving Training Program.

After conducting a detailed assessment to determine the suitability of CNG versus electric autos it emerged that women preferred electric autos due to lower maintenance costs, ease of operation, and favourable fuel expenses. This led to the transition of the training program to electric autos.

Growth

Namma Yatri collaborates with NGOs focused on skilling and women's empowerment to provide specialized training for women. The program begins with a trial phase designed to assess participants' confidence and aptitude for driving an auto-rickshaw. This is followed by a screening process that evaluates their ability to handle operational challenges, use a smartphone effectively, and commit to the program.

Selected candidates undergo a comprehensive 60-day training program, which combines classroom instruction with practical, on-the-road driving sessions. Upon successful completion, some trainees have progressed to become trainers themselves, thereby expanding the program's reach and impact.

Initially, the first five trainers were selected based on interest and potential. Over time, a formal selection criterion was developed to ensure consistent quality. Trainers are now required to have at least four months of driving experience, demonstrate daily earnings between INR 1,200–1,500, and successfully complete both oral and written assessments.

Barriers

- Lack of access to formal financing
  - Most women depend on male family members who handle household finances. Few women have a CIBIL score or an existing bank account to directly purchase an auto.
  - Formal financial institutions rarely provide loans to single women due to societal biases. Some banks and NBFCs have rules against providing loans without a male guarantor.
  - Even if a loan is provided concerns were raised about whether women would be able to make payments and how maternity leave would impact down payments or rent.
- Societal biases against women becoming drivers. They are often stared at and not welcomed at metro and train station queues where male drivers dominate.

Solutions

- To enable viable financing options:
  - Namma Yatri has partnered with NGOs to provide e-shram cards and other welfare documents. They have also collaborated with organizations to offer education loans.
  - Since 90% of the women opt for renting an auto first, to help encourage prudent financial planning and saving, Namma Yatri has a saving model where drivers are expected to earn INR 1,200 per day, with INR 400 allocated to Namma Yatri for auto repayment and INR 400 saved in a wallet.
  - Since gig workers' income patterns are based on daily wages and not monthly salaries, some NBFC partners have introduced weekly EMI payment options instead.
  - In some cases. Namma Yatri covers auto rent during maternity leave.
- To address safety concerns, a dedicated safety section is incorporated in the training. Namma Yatri also collaborates with Bangalore Traffic Police to ensure safety awareness.
- To help women become at par with their male counterparts, they are given training on smartphone usage, intimated on high-demand routes and traffic patterns.
- To adjust the training schedule to accommodate women's personal responsibilities, their training sessions last only 30 minutes.
- Community training sessions feature female trainers and successful drivers to inspire participants and break the societal condition that women can not drive. In Muslim communities, trainers from within the community are engaged to encourage participation.

Through the training program,

400-450

women have undergone training of which

200

women have become drivers. 8-10 of these women have become trainers themselves.

Aspirations

Many trainees have experienced difficult marriages and only few have supportive husbands. Their ages range from as young as 19 to as old as 50 with varying levels of education. Many women seek financial independence and stability. Some aim to become trainers after gaining experience.

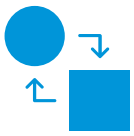
Advice

Women require additional training on financial literacy and technology use, as they often lack prior experience in these areas.

3. Callouts:

Key Advice

While several states, including Karnataka, Rajasthan, and Maharashtra, offer government subsidies for women, these incentives typically require beneficiaries to purchase an auto-rickshaw before claiming the subsidy. For many women, limited access to financing makes it difficult to take advantage of these programs. A more effective approach would be to provide subsidies directly to auto OEMs, thereby reducing the upfront financial burden on women. This model is already implemented at the central level through flagship initiatives such as the FAME and PM E-Drive schemes.



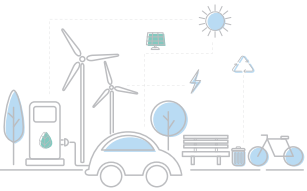
Expected Changes in the Domain

- Women's acceptance in the industry is growing, but continued support is necessary to ensure long-term success and inclusion in the workforce.
- Increased access to financing, targeted skill-building initiatives, and policy adjustments to better accommodate their needs.
- For trainees, participation can be increased through community role models, provide maternity leave support; improving financial credit assessments for women.
- Industry support for women trainers and recognition of their value must increase.

Essential Skillsets Required

Driving training can be imparted to everyone but additional skills of smartphone use, traffic rules and navigation, handling customers, financial planning and literacy for loan payments and auto payments is also essential.

Case Study:
Siemens



5.2. Women in EV Charging Infrastructure and Deployment

1. Basic Information:

Organizational Hierarchy:
Entry-level

Job Title:
Business Development Professional

About the Organization:

Siemens is a global leader in EV charging infrastructure, manufacturing high-performance charging systems like SICHARGE FLEX for both passenger and heavy-duty electric vehicles. The company also provides integrated software and services to optimize grid connectivity and support the transition to sustainable mobility.

2. Journey Map:

Entry

- Degree in Mechanical Engineering
- 9 years of total professional experience
- Passion for sustainability and environment prompted interest in EV sector
- Active in the EV manufacturing sector for over 2 years

Growth

- Leads business development in the EV charging portfolio of a prominent EV charging manufacturer.
- Engages with EV OEMs, charge point operators, and other stakeholders related to the automotive industry

Barriers

- Male-dominance rendering propagation of gender stereotypes and biases that question technical competence
- Discriminatory and heightened professional standards by virtue of gender
- Travel requirements of job present safety concerns due to lack of gender perspective in company protocols. Further, management of domestic responsibilities is a challenge

Workplace Initiatives

- Tracking tools for employees traveling to client locations reduces safety concerns.
- Mentorship program to support entry-level employees

Biggest Achievement:

Enrolled as a Mentor with the company to support career growth and improve the technical expertise of entry-level women professionals.

Aspirations

- Make women aware and passionate about this sector to encourage their entry in the future
- Current professionals can serve as an example to prompt entry of women in this sector

Advice

- Companies must institute additional protocols for employee travel to address safety concerns from a gender-neutral standpoint
- Enable women to enter leadership roles and mentorship positions
- Improve recruitment policies that result in higher intake of women from STEM fields

3. Callouts:

Key Advice

Diversity-driven recruitment policy with targeted talent recruitment of fresh women graduates for manufacturing and engineering roles, as well as lateral recruitment of women from other sectors, can help increase women's participation.

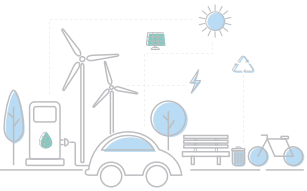
Expected Changes in the Domain

- Addressing safety concerns and challenging stereotypes and gender biases is necessary
- Due recognition to women's leadership and conscious effort to improve their visibility

Essential Skillsets Required

- Having practical expertise and knowledge on technical themes especially in the electro mechanical field for EVs
- Project management skills for liasoning of land, handover of chargers and accounting for infrastructure needs of the client
- On the job training is also critical to amass practical skills

Case Study:
Tata.ev Dealership



5.3. Women in EV Operations and End-Use

1. Basic Information:

Organizational Hierarchy:
Entry-level

Job Title:
EV-specialist Sales

About the Organization:

Tata.ev is Tata Motors' dedicated electric vehicle (EV) retail initiative, offering a comprehensive experience for customers interested in sustainable mobility solutions.

2. Journey Map:

Entry

Came from a background in sales; transition into EV sector was not planned, but a continuation of existing sales career

Growth

Built confidence in product knowledge and self-presentation; thrived in a supportive team led by women managers

Barriers

Lack of driving skills initially limited mobility; societal norms where many women don't drive remain a challenge

Solutions

Actively learning to drive; draws strength from female leadership and supportive workplace culture

Biggest Achievement:

Establishing herself as a confident sales professional in a growing EV dealership environment with women-led leadership.

Aspirations

Sees potential for more women to join EV dealerships in sales and management roles, supported by safe spaces and women-led initiatives

Advice

Confidence - both in the product and oneself - is the key to success in EV sales

3. Callouts:

Key Advice

"Be confident - in yourself and in the product you're selling."

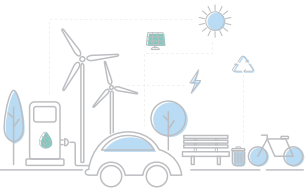
Expected Changes in the Domain

Improved EV charging infrastructure, particularly more mega-chargers, will accelerate growth and adoption

Essential Skillsets Required

Confidence, communication, customer engagement, and driving skills (as a fundamental enabler for women professionals)

Case Study: Tata.ev Dealership



1. Basic Information:

Organizational Hierarchy:
C-suite

Job Title:
General Manager

About the Organization:

Tata.ev is Tata Motors' dedicated electric vehicle (EV) retail initiative, offering a comprehensive experience for customers interested in sustainable mobility solutions.

2. Journey Map:

Entry

Entered EV retail through family business; experienced male-dominated industry culture firsthand.

Growth

Established policies to ensure 30-40% women employees across all functions, not just receptionist roles; promoted women into mid- and senior-level positions.

Barriers

Gender bias in industry meetings and lack of recognition of women as credible drivers or decision-makers.

Solutions

Created internal policies for women's representation, encouraged female-to-female customer engagement, and built a more inclusive dealership culture.

Biggest Achievement:

Institutionalized women's representation (30-40 percent) across dealership roles, setting an example for inclusivity.

Aspirations

Hopes to see stronger industry-wide representation policies, mentorship programs, and safe working conditions for women professionals.

Advice

The EV retail sector is dynamic and forward-looking, offering promising opportunities for both women and men to engage and thrive.

3. Callouts:

Key Advice

"The industry is growing, and now is the right time to join. It's dynamic, future-focused, and there's space for everyone to make a mark."

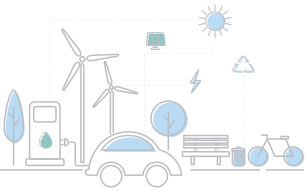
Expected Changes in the Domain

Expansion of mega charging infrastructure; stronger industry-wide inclusivity and mentorship initiatives.

Essential Skillsets Required

Adaptability, people management, customer engagement, and leadership

Case Study: Tata.EV Service Center



1. Basic Information:

Organizational Hierarchy:
Mid-level

Job Title:
Customer Relations Manager

About the Organization:

Tata.ev is Tata Motors' dedicated electric vehicle (EV) retail initiative, offering a comprehensive experience for customers interested in sustainable mobility solutions. It provides a range of services including test drives, vehicle configuration, and after-sales support, all tailored to the needs of EV owners.

2. Journey Map:

Entry

Transitioned from BPO/call centre background to EV sector, driven by belief that EVs are the future.

Growth

Underwent a two-month technical training program; built strong skills in customer handling and product knowledge.

Barriers

Faced gender-based challenges such as verbal abuse from customers and lack of recognition for women in technical roles.

Solutions

Relied on supportive mentors and managers; strengthened product knowledge; highlighted the need for safe travel facilities and recognition through incentives.

Biggest Achievement:

Transitioned from a non-technical BPO background into a customer relations role in EV servicing, backed by technical training.

Aspirations

Envisions more women growing into supervisory and technical lead roles, provided there is adequate training, safety, and recognition.

Advice

With proper training and technical knowledge from companies, women can be motivated to enter technical EV roles, beyond just customer-facing positions.

3. Callouts:

Key Advice

"If companies provide training and technical knowledge, women will feel more motivated to join."

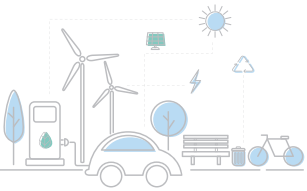
Expected Changes in the Domain

Increased recognition of CRM/service roles through KPIs and incentives; better travel and safety facilities for women.

Essential Skillsets Required

Customer handling, strong product knowledge, technical training, and resilience in handling difficult customer interactions.

Case Study:
Ar4Tech



5.4. Women in EV Retrofitment

1. Basic Information:

Organizational Hierarchy:
C-suite

Job Title:
Founder

About the Organization:

AR4Tech provides mechanical EV conversion kits to retrofit all kinds of vehicles and provides training to dealers and OEMs to enable them to service their vehicles to be retrofitted.

2. Journey Map:

Entry

Have done Master's in Computer Science, initially worked in academia before taking on operational roles in India's first power hub motor manufacturing setup. She progressed from operations manager to managing director before founding AR4Tech to address gaps in the EV retrofit market.

Growth

AR4Tech found the EV servicing space relatively accessible, with fewer components than ICE vehicles, making it easier for women to learn conversion services. Rural women near the factory, initially employed in housekeeping, quickly transitioned to mechanical roles after receiving training, becoming skilled within three months.

Barriers

- **Talent Gap:** Only 25% of AR4Tech's workforce are women due to systemic, social, and structural challenges.
- **Systemic:** Limited access to technical education; many employees lack ITI qualifications required for retrofit services.
- **Social:** Lack of family support and unsupportive college environments discourage women from pursuing engineering careers.
- **Structural:** Academic curricula often do not match industry requirements, limiting hands-on experience.

Solutions

- **Skill Development:** Collaboration with ITIs, local colleges, and Tamil Nadu Skill Development Corporation to provide technical training aligned with industry standards.
- **Flexible Training:** Courses structured to accommodate women's personal responsibilities and daily wages, supported through CSR funds.
- **Curriculum Alignment:** Colleges incorporate practical, multi-disciplinary projects with industry review to build relevant skills.

Aspirations

- Increase women in leadership roles (HODs) in engineering colleges.
- Bring more rural women into the EV workforce through targeted training.
- Promote family and societal support for women pursuing technical careers.

Advice

Women can work in all parts of the EV value chain if properly trained, including motor assembly, component manufacturing, battery assembly, and testing.

3. Callouts:

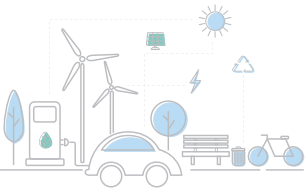
Key Advice

- Provide stipends to trainees and incentives for trainers to encourage women's participation.
- Mandate 20–25 percent women employees in OEMs, supported by tax benefits or other incentives.
- Establish creche facilities in industrial zones to support women's career continuity.
- Ensure maternity leave does not affect salary, promotions, or career advancement.

Expected Changes in the Domain

- Demand for roadside mechanics and service technicians is a growing entry point.
- Colleges need better labs and faculty to provide practical, hands-on training.
- Work environments should prioritize safety and support for women's mobility.

Case Study:
MoEVing



5.5. Women in EV Operations and End-Use

1. Basic Information:

Organizational Hierarchy:
C-suite

Job Title:
Head of Strategy and Growth

About the Organization:

MoEVing is a startup focused on building EV charging infrastructure and operating EV fleets, emphasizing sustainable mobility solutions and inclusive workforce development.

2. Journey Map:

Entry

Began her career as an electrical engineer, later pursuing an MBA that led her into consulting with PwC where she worked on government energy efficiency reforms and collaborated with EESL on its electric car rollout, her first exposure to electric mobility. She deepened her expertise in the EV sector through policy work with ADB and the Ministry of Power, particularly around charging infrastructure and decoupling electricity sales from charging services.

Growth

Realizing the importance of gaining on-the-ground experience, she joined Moeving, a young startup, where she took charge of building its charging infrastructure. Starting from scratch, she managed land negotiations, dealt with contractors, and oversaw civil and electrical works, often facing skepticism in the male-dominated space. She overcame these challenges by proving her competence, delivering results, and steadily building a team that now numbers ten.

In her four years at Moeving, she has successfully set up 40 charging stations and transitioned into her current role as Head of Strategy and Growth. Alongside building infrastructure, she has been attentive to gender inclusion, advocating for women-friendly facilities such as restrooms at charging hubs. Under her leadership Moeving has trained and transitioned around 35 women driving partners from 3Ws to EV 4Ws, proving the capability of clean mobility in opening avenues for women in logistics.

Aspirations

Aspires to scale Moeving's EV fleets in ways that are both sustainable and profitable, while creating inclusive pathways for women across roles from drivers and supervisors to strategic leaders.

Biggest Achievement:

Trained and transitioned around 35 women driving partners from 3Ws to EV 4Ws

3. Callouts:

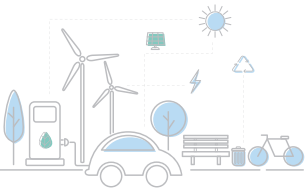
Key Advice

- **Biggest** Achievement**:** Establishing 40 charging stations and leading Moeving's growth in EV fleet operations.
- **Key Advice:** "Embrace the opportunities in this fast-growing sector with confidence, as no role is beyond a woman's capability"
- **Expected Changes in the Domain:** Rising opportunities for women in analytics, digital operations, and managerial roles as fleet management becomes increasingly data-driven.

Essential Skillsets Required

- Driving proficiency
- Digital literacy (telematics, data management, Excel)
- Adaptability to fast-evolving technologies

Case Study: Pickkup.io



1. Basic Information:

Organizational Hierarchy:
C-suite

Job Title:
Co-founder

About the Organization:

Pickkup.io is a logistics startup that began as a small diesel fleet and has transitioned into a growing EV fleet operator, focusing on efficiency, sustainability, and driver empowerment.

2. Journey Map:

Entry

Motivated by a desire to build something of her own and leveraging her experience in management information systems (MIS) and industry engagement, she partnered with a colleague who owned a small, uncoordinated vehicle fleet. After researching market gaps in late 2020, they formally launched Pickkup.io in early 2021. Initially managing operations alone while her partner handled sales, she built the foundation of the company from the ground up.

Growth

Recognizing the future of sustainable logistics, she led the company's transition from diesel to electric vehicles—starting with just two EVs and expanding to a fleet of 70. She emphasized driver welfare and stability by offering permanent salaries and financial support during crises, fostering a culture of loyalty and trust in a traditionally transient workforce.

Barriers

As a woman leading fleet operation, she often faced skepticism from clients and drivers. Building credibility and trust required perseverance, empathy, and effective communication—particularly in tense negotiations and operational challenges.

Solutions

- Fostered strong relationships with drivers through empathy, open dialogue, and personal support.
- Developed Pikkup Track, an in-house digital platform to monitor driver behavior, vehicle location, and telematics in real time.
- Introduced structured onboarding systems including insurance, bank account facilitation, and driving tests to professionalize the workforce.

Biggest Achievement:

Scaling Pickkup.io from a handful of diesel vehicles to a 70-vehicle EV fleet while maintaining 100% employee retention.

3. Callouts:

Key Advice

"Challenges are rewarding, and this sector allows women to create unique identities through leadership."

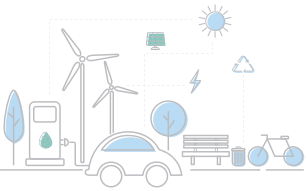
Expected Changes in the Domain

Corporates embracing sustainability will accelerate EV adoption, creating more space for women as delivery partners, and managers.

Essential Skillsets Required

- Confidence and resilience in navigating dynamic field environments.
- Flexibility beyond traditional work hours to manage logistics operations.
- Comfort with technology, telematics, and digital management systems.

Case Study: Reema Transport



1. Basic Information:

Organizational Hierarchy:
C-suite

Job Title:
Director

About the Organization:

Reema Transport is a logistics company that evolved from a small family-run transport business into a professionally managed enterprise integrating modern systems, structured processes, and inclusive workforce practices.

2. Journey Map:

Entry

Her journey into the transport sector began with her participating in the family business, founded by her father. After completing her post-graduation and gaining corporate experience at organizations like KPMG, she chose to return home and lead the family enterprise. Transitioning from the corporate world to the informal transport industry was a significant shift — the sector was largely unstructured, male-dominated, and operated through informal networks.

Growth

She leveraged her corporate background to bring professionalism, structure, and people-centric leadership to the company. She implemented an open-door policy, emphasized individual strengths, and gradually introduced automation and digital systems without disrupting the traditional work culture. Her balanced approach enabled smoother transitions, improved efficiency, and fostered trust among employee

Barriers

Operating in a male-dominated sector, she initially faced skepticism regarding her leadership and resistance to organizational reforms. Promoting the idea of "smart working" and structured processes in an informal ecosystem was challenging. However, through persistence and consistent results, she built credibility and cultivated an inclusive, forward-looking work environment.

Aspirations

She envisions a future where women play stronger roles in logistics and fleet operations, from leadership positions to on-ground delivery and coordination roles. She believes that collaboration, mentorship, and government support, through infrastructure development and driver incentives, are crucial to making transport operations more gender-inclusive and future-ready.

Biggest Achievement:

- **Successfully modernized her family-owned transport company, integrating professional systems and digital practices.**
- **Launched the "Chalak se Malak" (Driver-to-Owner) initiative within her organization to empower drivers and promote entrepreneurship.**
- **Serves as Chairperson of the Women's Wing at the All India Transporters Welfare Association (AITWA), advocating for women's participation in logistics.**

3. Callouts:

Key Advice

"Never fear failures. Stay consistent, seek mentorship, and have a long-term vision."

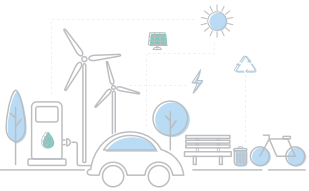
Expected Changes in the Domain

- Expanding local delivery and e-commerce logistics will create new avenues for women in operations, supervision, and management.
- Strengthened industry networks and mentorship programs can accelerate women's entry and retention in logistics leadership.

Essential Skillsets Required

- Confidence and adaptability in fast-evolving environments.
- Strategic thinking to balance traditional and modern practices.
- Ability to integrate digital tools and automation into operational workflows.

Case Study 1: MOWO (Moving Women) Social Initiatives



5.6. Women in Skilling and Training

1. Basic Information:

Organizational Hierarchy:
C-suite

Job Title:
Founder

About the Organization:

Social enterprise established in 2019 focusing on building an ecosystem for women in mobility. Operates India's first motor training center exclusively for women, emphasizing driving as a life skill rather than just employment training.

2. Journey Map:

Entry

Founded in 2019 after India-Vietnam motorcycle expedition where she observed women in their 40s working as bike taxi riders in Thailand. She recognized a huge opportunity viz., Indian women seeking livelihood alternatives but lacking basic mobility skills, due to the social perception that driving is a 'male-associated skill'.

Growth

- She is individually accoladed with the Nari Shakti Award 2019, PM recognition
- Partnership with Telangana Department of Women & Child Welfare - built India's first women-exclusive training track. Operates across 4 districts in Telangana with expansion to Delhi, Bangalore, Chennai through partnerships.
- Complete transition to EV training in 2022, reducing learning time from 25 days to 10 days. High-impact awareness campaigns with manufacturers demonstrating women's capabilities while generating training demand.

Barriers

- **Cultural:** Driving perceived as male skill across all economic classes, family resistance, women not recognizing driving as essential life skill.
- **Structural:** No women-exclusive facilities nationwide, language barriers in license testing, computer-based test challenges for women with limited digital literacy.
- **Economic:** License costs (₹1,000) seen as unnecessary expense, lack of commercial pathways, limited EV financing options, perception that EVs are fragile investments.
- **Geographic relevance:** Training programs not designed for rural/remote settings
- **Infrastructure:** Missing essential facilities like resting points, washrooms, daycare facilities making mobility sector inaccessible for women with children.

Solutions

1. **Life Skill Philosophy:** Teaching driving as fundamental skill rather than employment training, removing pressure while building confidence for organic career transitions.
2. **Location-Based Training:** Prioritizing accessibility by operating in city centers rather than remote locations, ensuring sustained skill use post-training.
3. **8-Step Training Module:** Motivation sessions, traffic rules education, license support, technical skills, safety protocols, EV-specific training, livelihood skills, trainer development.

Biggest Achievement:

Established India's first women-exclusive motor training center through an innovative government partnership model, training 500+ women while eliminating capital investment barriers.

Aspirations / Advice

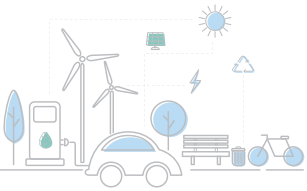
- National awareness campaign making driving a universal life skill expectation for women
- Industry investment mandates for women's mobility skills development
- Life skill vs employment focus allows women to build confidence without pressure, enabling organic transition to commercial opportunities over time

Key Advice:

Three Priority Areas for Mainstreaming:

1. **Awareness:** Large-scale campaign (Swachh Bharat scale) establishing driving as universal women's life skill
2. **SHG Integration Model:** Comprehensive facilities combining healthcare, charging stations, daycare, washrooms within existing Self Help Group network
3. **Policy:** Free/subsidized licenses, mandatory 10-25% women in commercial fleets, integration with SDC skilling programs
4. **Industry Investment:** Mandatory company funding for women's driving skills, similar to Urban Company's service provider training model

Case Study 2: Automotive Skills Development Council (ASDC)



5.6. Women in Skilling and Training

1. Basic Information:

Organizational Hierarchy:

C-suite

Job Title:

Executive Vice President & Chief-Strategy & Operations

About the Organization:

ASDC facilitates industry accredited training for roles in the automotive industry and has 10 plus courses on EVs, ranging from servicing to driving to manufacturing and assembling. The courses are provided free of cost either funded by government or CSR initiatives.

2. Journey Map:

Entry

- Got an engineering degree and then MBA in finance.
- Started her career in the software industry and then worked in the banking sector for 7- 8 years.
- Got involved in corporate training and realised the potential of skilling to bring a change.
- Pivoted and joined ASDC without a background in the automotive sector.

Growth

- Noticed how gender skewed the industry is and the lack of women applying to be trainers.
- Observed that once a female trainer joins a group, the behaviour and sincerity of the entire batch changes. This was a trigger of change to get more women trainers.
- ASDC has now moved to fully female batches for manufacturing.
- Still only 10% are female trainers with a particular dearth in the technical side like robotics and automation. There are more trainers for soft skills like sales, while participation in the dealership and manufacturing side has started to pick up.

Barriers

- Misconception that only men can work in the automotive sector, dealerships or be mechanics.
- Resistance from the family to the women from joining the training, completing it and post-completion joining placements and the workstream
- Issue of safety when traveling to the training center.

Solutions

- Outreach to women and motivating them is important to generate awareness of the opportunities. Engagement with families has enabled increased participation of women.
- Make changes to the training ecosystem as per their requirements-
  - The shifts can be from 8am to 2pm when their children are at school
  - Use branded sarees instead of a dress code or uniform to make them comfortable.
- Training beyond technical skills: Training in soft skills on how to behave and handle situations is important to give confidence when women go for placements.
- Broadening reach through both industry based and private sector trainers and centres.
  - ASDC has training partners who after proper accreditation and affiliation run programs with us. ASCD as such does not own any training centers.
  - For placements of these women trainers, ASDC is fully supported by three associations in the automotive sector SIAM, FADA, and ECMA.
- At the company level, small component manufacturers, OEMs making changes to their infrastructure, providing washrooms, day time shifts for women are enabling them to have fully female operated assembly lines. They are observing that retention and productivity in both men and women have increased.

Biggest Achievement:

- **EVs are enabling the penetration of more female participation and gender inclusion in this space. Across all their courses, with 30% being EV related courses, ASDC now has a total of 20,000 female participants.**
- **An initiative with a leading OEM's CSR program had a target of training only women dealership personnel, EV service technicians and sales personnel. Within 6 months, 4,100 women were trained with more than 50% getting a placement across 15 states.**
- **For a project with the UK Aspire Programme for training of EV servicing and charging operators, there was no specific mandate for female inclusion but through efforts 40% of intake of females was achieved.**

Aspirations

- The aspirations of the women coming to train is to earn a living, give a better life to their children. Some want to leave their husbands and escape abuse while many are widowers.
- EVs have made it easier for women to enter the automotive space, given the perception of clean mobility. As this sector creates more space for female service technicians, charge point operators, and taxi drivers, there is no role women cannot participate in.
- EV trucking is on a nascent stage and by starting training for women on commercial vehicles and buses, new opportunities can be leveraged in this space. But women can be in every part of the value chain from driving, services, manufacturing to sales.

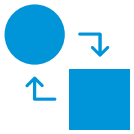
Advice

- There is often some kind of resistance to seeing female leadership among peers or women working in places like welding shops but over time they get used to it. Work properly and the work will start speaking for itself.
- Success of a training program is defined differently for men and women. For women, retention and completion of the training is most important so that they at least have the knowledge and qualification, even if they do not sit for placements or get a job immediately. For this constant counselling and motivation for the women is needed.

3. Callouts:

Key Advice

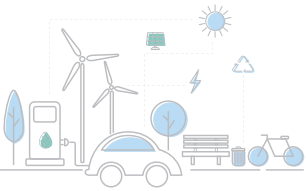
Female trainees are more comfortable with female trainers, as they may be anxious to open up to male trainers. So, to increase women's participation in skilling, we need more women. The female trainees themselves can become female trainers.



Expected Changes in the Domain

- Need to change the mentality to convince women and their families to support them to not just join the program but also complete it.
- Safety of the women during the commute, throughout the day and during the training needs to be ensured. The staff on ground and trainers at the center need to be sensitised. POSH sessions should be given to everyone.
- Courses on EV charging need to be developed.
- There are many EV policies in different states but nothing concrete on training pans out.

Case Study: Azad Foundation



5.7 Women as Enablers in Civil Society

1. Basic Information:

Organizational Hierarchy:
C-suite

Job Title:
Chief Functionary

About the Organization:

Azad Foundation is a feminist organisation that focuses on bringing women into non-traditional livelihoods, particularly in the transport sector.

2. Journey Map:

Entry

Azad Foundation was founded with an explicit feminist agenda to navigate patriarchal structures while creating economic opportunities for women. Recognized that bringing women into driving would challenge patriarchal structures, disrupt male-dominance in transport sector and expand women's professional choices beyond traditional roles (e.g. teaching, nursing, domestic work and more), which both restricted opportunities and reinforced gender stereotypes.

Growth

Developed a comprehensive ecosystem approach combining working with the family of target beneficiaries and providing training with guaranteed market access through strategic partner Sakha Cabs. Post-COVID (2022), leveraged gig economy companies' increased demand for women drivers to scale EV training initiatives under the "Women with Wheels" programme. They are currently partners with Delhi Transport Corporation, Snap-e Cabs, Even Cargo, Rapido, Domino's Pizza, to name a few.

Barriers

- Social: Deep family/community resistance, historical conditioning against women in transport, limited male support systems.
- Financial: Banks won't provide loans without collateral; EV costs (₹15-17 lakhs) versus women's income (₹13-14k monthly); rental models charging ₹3-4k monthly.
- Infrastructure: Inadequate charging stations for two-wheelers, lack of gender-inclusive facilities (changing rooms, restrooms), safety concerns.

Solutions

Gender Transformative Skill Education Framework:

- Transformative skills: confidence building, legal rights, self-defense, professional communication, digital literacy for apps, customer service, financial literacy, safety awareness
- Technical driving training
- Direct market integration through employer partnerships

2. Community-based Interventions:

- Leadership programmes creating exemplary agents on ground
- Community engagement with families/male members; Gender sensitisation for males
- Monthly community engagement or counseling support systems

Biggest Achievement:

- **93 women bus drivers in Delhi (majority of which are driving EVs); Negotiated with Delhi Transport Corporation to modify height requirements for drivers for women inclusion**
- **Successful placement across major gig platforms**

Aspirations / Advice

- Policy mandates: 20-25% women employees in transport with tax incentives
- Gender-inclusive infrastructure investment across industries
- Reformed financial access for marginalised women
- Mainstream community engagement campaigns

Key Advice:

- The three key priority intervention areas should be:
  a. Infrastructure: Invest in gender-inclusive workspaces and charging networks
  b. Holistic Skilling: Transformative skills beyond technical training
  c. Community Engagement: Systematic approach to changing social norms

Part III:

Key Reflections and Strategic Pathways

6

Summary of Surveys and Case studies

6. Summary of Surveys and Case studies

The EV Opportunity and Technological Shift

The transition to EVs presents a substantial opportunity for gender inclusion, primarily by shifting the nature of work.

- **Gender-Neutral Workforce:** EV manufacturing roles are less physically taxing (86.52 percent of respondents confirmed this) and rely more on skills and knowledge, making the sector increasingly suited for a gender-neutral workforce. This shift attracts women who have no precedence of working in the automobile sector (82 percent of manufacturing respondents).
- **Ease of Operation:** The adoption of EVs facilitates the entry of women into the gig economy, as EVs are considered easy to use. Over 95 percent of surveyed women driving partners indicated that their current organization was their first instance of working in the driving profession.
- **Organizational Support:** Participation is heavily enabled by a supportive environment. A high majority of women in EV manufacturing reported supportive family environments (99 percent) and management accommodating domestic responsibilities (~94 percent). Furthermore, job flexibility allows driving partners (over 93 percent of respondents) to comfortably manage domestic duties.

Persistent Barriers and Systemic Gaps

Despite the technological advantages, significant social, economic, and infrastructure barriers persist.

- **Safety and Social Hostility:** Women driving partners face significant on-road hostility from male counterparts (over 60 percent reported incidents) and harassment from passengers (nearly 40 percent reported incidents). Safety concerns are overarching, restricting night driving for most women (65.12 percent terminate work by 10 pm).
- **Infrastructure Deficiencies:** A major challenge across the ecosystem is the lack of gender-inclusive infrastructure. Over 60 percent of gig

economy driving partners reported issues accessing clean and safe public toilet facilities during work hours. Additionally, while women in manufacturing were satisfied with general safety, the design of protective equipment often needs customization through a gender lens. For future owners, safety and convenience of charging stations are paramount.

- **Financial Inclusion Challenges:** Limited access to formal financing is a significant barrier for women seeking EV ownership or entrepreneurship. Over 86 percent of surveyed gig workers indicated challenges in financing vehicles, citing collateral requirements as a major hurdle.
- **Skilling and Growth:** While training is provided (98 percent of driving partners received training), opportunities for career advancement remain limited. A sizable share of manufacturing respondents (30.9 percent) indicated limited career growth opportunities. Furthermore, digital literacy and documentation remain entry barriers for resource-poor women.

Strategic Enablers Highlighted by Case Studies

Qualitative insights demonstrate successful models for overcoming these barriers through targeted interventions.

- **Holistic Training:** Successful programs involve comprehensive training beyond technical skills, including digital literacy, financial planning, customer service, and confidence building (transformative skills). Offering flexible training schedules also accommodates women's personal responsibilities.
- **Community and Institutional Commitment:** Engagement with families and community members is crucial to mitigating social barriers. Within organizations, establishing women-led assembly lines, implementing strong gender representation policies (e.g., 30-40 percent targets), and providing mentorship opportunities are effective strategies for growth and retention.
- **Policy Adjustments:** Case studies advocate for targeted policy support, such as providing subsidies directly to OEMs to reduce the upfront cost burden on women, and creating financial products (like weekly EMI options) that align with the income patterns of gig workers. Regulatory support to streamline the process of obtaining licenses is also warranted

7

Recommendations for Gender Mainstreaming in the EV Transition

7. Recommendations for Gender Mainstreaming in the EV Transition

The transition to EVs presents a significant opportunity to foster a more inclusive and diverse automobile industry in India. While progress has been made, challenges persist that hinder women's full participation in the EV sector. Addressing these challenges requires coordinated efforts across individual, institutional, and policy levels, as well as targeted interventions in skilling and financial inclusion, as illustrated in Figure 43.

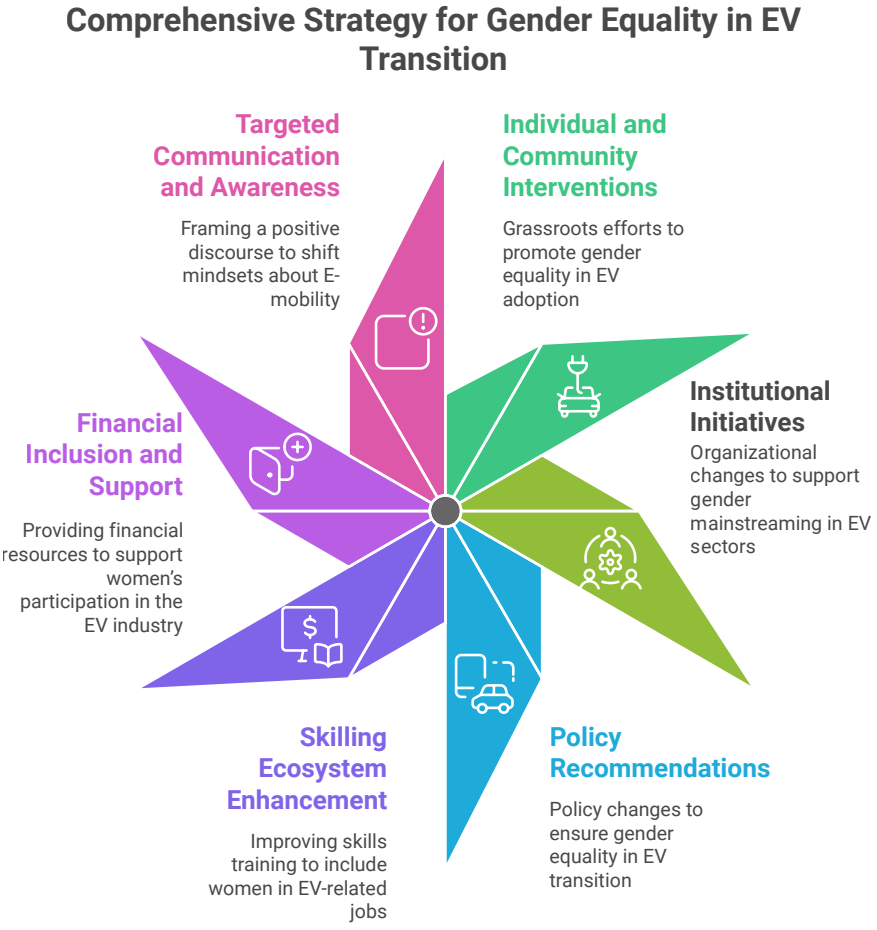


Figure 43: *Framework for Gender-Inclusive EV Transition*

A. Individual and Community-Level Interventions

Societal and cultural norms have traditionally dictated women's participation in the workforce, specifically in manufacturing roles. The opportunities incoming with the EV sector encourage women's participation and facilitate a positive discourse to shift mindsets and treat the E-mobility transition as a generational reset for the automotive industry. Targeted communication interventions are key to build widespread awareness to realise gender mainstreaming in the EV sector.

Strategies:

- Educational Outreach: Implement awareness campaigns in schools and universities to promote STEM education among girls and young women.
- Community Engagement: Organize grassroots-level programs targeting women and girls to broaden their career horizons beyond traditional roles. Highlighting success stories of women in the EV sector can inspire others.
- Leverage existing grassroot mechanisms: To create widespread awareness on trainings, resource access and opportunities around increasing EV related livelihood opportunities for women existing local institutional set-up like Self help
- Groups, Village Organisations and skilling institutes can be used.
- Family Sensitization: Conduct sessions for families to address concerns about safety and job roles, ensuring support for women entering the EV workforce.
- Male Engagement: Initiate programs to sensitize men and boys about gender biases and the benefits of women's participation in emerging industries.
- Building the right narrative: Create a compelling narrative via advertisements, marketing strategies, social media campaigns , datasets that shifts the traditional image of the automotive sector to include more women as EV owners, users and workers.

Opportunities for Policy Alignment

1. Objective: Create visibility for female role models and mentors in the automotive industry both at the national and local level to inspire and guide young women talent to technology-led domains

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Vigyan Jyoti Scheme under Department of Science and Technology	Scope of Activities	1. Facilitate special lectures, role model interactions, and tinkering activities with experts and industry partners from the EV sector 2. Organise site visits to EV manufacturing and service industries

2. Objective: Create widespread awareness on the training, resource access and opportunities around increasing EV-related livelihood opportunities for women

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Mission Shakti under Ministry of Women and Child Development	Section 2.2.8 of the Hub for Empowerment of Women (HEW) under the Samarthya Component	Organise awareness campaigns at the grassroot level to facilitate access to skilling and employment opportunities in the EV sector.
2	Training Programmes of National Productivity Council	Online Trainings	Include Electric Vehicles category - Add modules tailored to EV manufacturing jobs to provide upskilling opportunities in the sector

3. Objective: Undertake initiatives to build the right narratives at the institutional level to curtail the propagation of gender stereotypes in workplaces.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Mission Shakti under Ministry of Women and Child Development	Section 2.2.8 of Hub for Empowerment of Women (HEW) under the Samarthya Component	Build the capacities of government functionaries at all levels of the HEW and orient them about opportunities in the EV sector.
2	Training Programmes of National Productivity Council under Department for Promotion of Industry & Internal Trade	Annual Training Calendar	Develop and incorporate a gender sensitisation training program as part of the annual training calendar.

B. Institutional-Level Initiatives

Bringing more women into the EV sector requires a supportive and safe work environment for women. Towards this, companies and organizations working in the sector from OEMs, dealerships, EV charging manufacturers, fleet operators etc. have a responsibility to institute practices and adhere to existing regulations and laws meant to protect and support women in the workplace.

Strategies:

- Workplace Facilities: Ensure the availability of clean and hygienic washrooms, childcare facilities, and well-lit workspaces.
- Flexible Work Options: Offer flexible working hours, remote work possibilities, and childcare leave to accommodate women's responsibilities.
- Safety Protocols: Implement safety measures such as CCTV surveillance, well-lit areas, and travel tracking for employees working in remote locations or during night shifts.
- Gender Sensitization Training: Conduct regular workshops on gender sensitivity and the Prevention of Sexual Harassment (POSH) Act for all employees.
- Mentorship Programs: Establish mentorship initiatives to support the career growth of women employees.
- Inclusive Recruitment Policies: Adopt recruitment practices that encourage the hiring of women, especially in technical and leadership roles.

Opportunities for Policy Alignment

1. Objective: Facilitate the creation of a safe working environment and provide decent workplace facilities

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Factories Act, 1948 under Ministry of Labour and Employment	Chapter IV of the Act specifies safety measures, prohibits hazardous work for women, and ensures safe machinery use,	Mandate safety audits and gender-sensitive infrastructure standards for EV charging stations and fleet depots.
2	Occupational Safety, Health and Working Conditions Code, 2020 under Ministry of Labour and Employment	The Act allows women to work at night with safety provisions (transportation, security, lighting).	Encourage CCTV, lighting and travel tracking requirements as part of labour compliance for EV logistics and ride-hailing operators.
3	Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH) under Ministry of Women and Child Development	The POSH Act mandates safe workplaces and Internal Complaints Committees (ICCs).	Strengthen local-level POSH awareness among small fleet aggregators and EV startups.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
4	Mission Shakti's Samarthya Component under Ministry of Women and Child Development	The Sakhi Niwas– Working Women Hostel component - promotes the availability of safe and conveniently located accommodation for working women and other women pursuing higher education or training, who need to live away from their families due to professional commitments.	Set up more Working women hostel facilities near factory floor locations and city outskirts where many automobile assembly lines are located
5	Mission Shakti's Samarthya Component under Ministry of Women and Child Development	The objective of Palna (Cresche Facility) is to address the urgent need for quality crèche care facilities by providing a safe & secure environment for nutritional, health and cognitive development of the children, thereby enabling more mothers to take up gainful employment	Ensure enforcement and setting up of well-maintained creche facilities which can accommodate the flexible schedules especially for gig economy workers near factory locations

2. Objective: Build on mechanisms to encourage women's participation and promote overall gender diversity

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Equal Remuneration Act, 1976 (now under Code on Wages, 2019) under Ministry of Labour and Employment	The act mandates equal pay for equal work and prohibits gender-based discrimination.	Introduce gender diversity criteria in government-linked EV schemes
2	Industrial Relations Code, 2020 under Ministry of Labour and Employment	State the need to ensure fair representation of women in grievance committees.	Encourage affirmative recruitment processes for women in technical and leadership roles
3	Code on Social Security, 2020 under Ministry of Labour and Employment	Expands coverage of social security benefits to gig and platform workers, allowing inclusive recruitment in new-age sectors	Mandate annual diversity reporting by large employers in the EV sector to promote transparency and accountability
4	National Policy for Skill Development and Entrepreneurship (2015) under Ministry of Skill Development and Entrepreneurship (MSDE)	The policy emphasises mentorship and support networks for women entrepreneurs.	Introduce mentorship modules within EV skilling initiatives under Skill India Mission

C. Policy-Level Recommendations

At a policy level, integrating gender considerations into EV policies and programs can help reduce regulatory restrictions, expand the reach of EV based roles and improve women's ease of doing business or work in the sector.

Strategies:

- Higher Subsides: Provide higher EV purchase subsidies for women, especially from economically disadvantaged groups.
- Reserved Parking: Reserve safe parking spaces for women at public and commercial EV charging locations.
- Gender-Responsive Policies: Develop and implement policies that specifically address the barriers women face in the EV sector, including access to incentives and training programs.
- Infrastructure Development: Invest in public infrastructure that supports women's mobility, such as safe public transport and accessible charging stations.
- Leadership Representation: Encourage the appointment of women in leadership positions within government-run technical training institutes and universities.
- Tax Incentives: Provide tax benefits to Original Equipment Manufacturers (OEMs) that hire and upskill women in the EV manufacturing sector.

Opportunities for Policy Alignment-

1. Objective: Develop policies that specifically address the barriers women face in the EV sector, as employees and consumers.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	State EV Policies under the Transport Department	Different sections of the policies, based on the State's vision, guidelines and goals can be relevant here.	Some of the aspects which can be covered in the policy framework to incorporate aspects of gender are- Differentiated incentives for vehicle purchase, Employment targets for women in manufacturing or operations, with incentives for companies that hire women in shop floors. Training targets for women, and offering subsidies for training women Requirements for gender impact assessment of existing transport related interventions or projects.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
2	Employment Linked Incentive (ELI) Scheme under Ministry of Labour and Employment	Part B: Support to Employers of the scheme covers generation of additional employment in all sectors, with a special focus on the manufacturing sector where employers will get incentives up for hiring additional employees.	To promote hiring of women in the EV manufacturing sector, ELI scheme can be offered to OEMs and ACMs if they meet a pre-defined quota/ reservations of women in their EV assembly lines. Essentially the aim is to boost women-driven manufacturing along the value chain

2. Objective: Improve and invest in usable public infrastructure for women working in the sector.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	National Rural Livelihood Mission under Ministry of Rural Development	A key feature of the scheme includes provisions of a Revolving Fund as a support to SHGs and a Community Investment Support Fund (CIF) SHGs through the Federations to advance loans and/or undertake common/ collective socio-economic activities.	The provision of the revolving fund and CIF can be used to build safe and reliable infrastructure combining healthcare, charging stations, daycare, washrooms within the existing Self Help Group network to help women working in gig-based roles.
2	Apna Ghar Initiative under the Ministry of Petroleum	Initiative aims to improve truckers' long-haul journey across the country by providing beds, restaurants, self-cooking areas, clean toilets and bathing areas, and drinking water facilities	Provide dedicated facilities for women which they can book through the mobile based Apna Ghar App.

D. Enhancing the Skilling Ecosystem

Capacity building and the upskilling of women for roles along the EV value chain is vital for their entry into the industry. For this, it is necessary to have a conducive skilling ecosystem which allows women to access capacity building initiatives in the first place, be given technical training and employment opportunities, as well as other skills needed for their overall professional advancement.

Strategies:

- Targeted Training Programs: Offer publicly sponsored courses focusing on technical, digital, financial, and legal literacy to empower women economically.
- Comprehensive Curriculum: Include project management, client engagement, and soft skills training in EV-related courses to prepare women for diverse roles.
- Accessibility: Ensure training centers are located in accessible areas and beyond urban areas and offer flexible timings to accommodate women's schedules.
- Partnerships for Placement: Collaborate with private companies in the EV industry to facilitate job placements for trained women.
- Incentivize Female Trainers: Provide financial incentives and career development opportunities to encourage more women to become trainers in the EV sector.

Opportunities for Policy Alignment-

1. Objective: Expand the scope of existing skilling programmes to include the EV sector relevant courses.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Pradhan Mantri Kaushal Vikas Yojana 4.0 (PMKVY) under Ministry of Skill Development and Entrepreneurship (MSDE)	Under PMKVY 4.0 there are special projects targeting women including training programs in sectors like Electronics, Retail, Healthcare, Beauty & Wellness, Handicrafts and Apparel.	Special projects targeting women can be expanded to include skill training in EV based livelihoods- mechanics, drivers, technicians etc.
2	Pradhan Mantri Skilling and Employability Transformation through upgraded ITIs (PM-SETU) under Ministry of Skill Development and Entrepreneurship (MSDE)	The PM SETU scheme guidelines include an objective to introduce new courses. They also state that the state lead-SPV responsible for setting up hub and spoke clusters have to provide technical support, staff and faculty training and capacity building, and curriculum development and diversification into high-growth sectors that have a favourable employment outlook for women.	EV sector can be recognised as a high growth sector for women, making curriculum development for EV based skills in the emerging and upgraded ITIs a priority

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
3	NAVYA (Nurturing Aspirations through Vocational Training for Young Adolescent Girls) under Ministry of Skill Development and Entrepreneurship and Ministry of Women and Child Development	This pilot initiative seeks to provide vocational training to adolescent girls in non-traditional and modern job roles such as digital marketing, cybersecurity, AI-enabled services, green jobs, and other emerging sectors.	Offer vocational training to young girls under this initiative by recognising the EV automobile sector as part of the emerging sectors/ non-traditional job roles
4	National Rural Livelihood Mission under Ministry of Rural Development	A key feature of the scheme includes supporting skill development of skills for rural youth and their placement, training and self-employment through rural self-employment institutes (RSETIs), innovations, infrastructure creation and market support.	The capacity building training programmes facilitated by the Mission to SHG members can include providing awareness and offering skill building in non-traditional livelihoods such as EV mechanics or driving for livelihood promotion. RSETI networks can be leveraged for integrating EV based curriculum.

2. Objective: Provide more professional opportunities and avenues to women to enter technical fields and roles.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Flexi-MOU scheme under Ministry of Skill Development and Entrepreneurship (MSDE)	Under the Flexi-MOU scheme, the Directorate General of Training (DGT) can sign MOUs with companies or prospective employers (industry) who have the infrastructure, training facilities,and trained faculty, to conduct in-house skilling of prospective employees (trainees) to add industry ready trainees to its workforce.	DGT can explore signing more MoUs with automobile companies. Within these MOUs, having quotas/ targets for women trainees can be explored to provide female candidates with exposure and on-the job training opportunities

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
2	National Apprenticeship Promotion Scheme (NAPS) under Ministry of Skill Development and Entrepreneurship (MSDE)	The MSDE organises Rozgar Melas and Pradhan Mantri National Apprenticeship Melas (PMNAMs) to facilitate the placements and apprenticeship opportunities to the certified candidates.	Women Candidate focused Melas under the NAPS can be organised to enable women candidates to connect with prospective employers
3	National Skill Development Policy under Ministry of Skill Development and Entrepreneurship (MSDE)	The National Skill Development Policy mentions (Chapter 4, 4.3) the need to institutionalise award and incentive mechanisms, including reward and career progression systems, to improve the status of trainers. Additionally mentions that special efforts will be made to improve the gender balance among trainers.	Propose an award/ incentive mechanism specifically designed to encourage more women to attend Training of Trainers sessions. Having specific targets for their employment/ enrollment as trainers can help

3. Objective: To improve women's participation in skill training courses

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Pradhan Mantri Skilling and Employability Transformation through upgraded ITIs (PM-SETU) under Ministry of Skill Development and Entrepreneurship (MSDE)	The initiative requires SPVs making the ITI hub and spoke clusters to create a five year Strategic Investment plan which must also include a Gender and Inclusion Plan to define strategies and actions for improving women's participation, especially in non-traditional trades.	A direct linkage where the Gender and Inclusion plan can suggest specific targets on female enrollment and placement in non-traditional roles including EV related courses. The plan must also look into improving access and funding avenues for women from rural areas, SC/ST communities and economically weaker sections to these ITIs.

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
2	National Skill Development Mission (NSDM) under Ministry of Skill Development and Entrepreneurship (MSDE)	Under the National Skill Development Mission (NSDM), District Skill Committees (DSCs) have been established for planning and coordinating skill interventions at the district level based on that district's unique skill needs and capacity building requirements. These DSCs are mandated to create District Skill Development Plans (DSDPs) for decentralised planning of skill needs in the area.	The DSDPs can have a structured and dedicated plan particularly targeting skill training for women including a plan to enhance women's accessibility and affordability and overall inclusion in skill training programmes. A plan to assess the possibility of women's participation in non-traditional sectors like EV, IT and automobiles must also be developed.

E. Financial Inclusion and Support

Systemic and institutional barriers have historically prevented women from securing loans and financial support. Improving women's access to financing for EV related ventures will require favourable loan financing options, and better awareness among the demographic of the options available to them.

Strategies:

- Loan Guarantees: Establish third-party organizations to provide first-loss guarantees to de-risk loans for women purchasing EVs.
- Flexible Repayment Options: Offer loan repayment schedules that align with the income patterns of gig economy workers, such as weekly or bi-weekly payments.
- Employer Support: Encourage companies to act as guarantors for loans taken by women employees for EV purchases.
- Financial Literacy Programs: Implement programs to educate women on financial management and loan repayment strategies.

Opportunities for Policy Alignment -

1. Objective: Financial awareness and support to women entrepreneurs

S.no	Existing Scheme/ Regulation	Provisions within policy or scheme	Recommendation
1	Women Entrepreneurship Platform under the NITI Aayog	EV-specific automotive incubators must be identified under the ambit of the platform to encourage women entrepreneurship.	Knowledge portal must be updated to reflect opportunities, schemes and other support initiatives to encourage women's participation in the EV ecosystem.
2	Mission Shakti under Ministry of Women and Child Development	A function of Hub for Empowerment of Women (HEW) includes- Organize community meetings to engage with the community to build awareness about social issues, facilitate discussions on issues concerning women.	Discuss finances, vehicle/ asset ownership by women and loan facilitation processes to these community meetings.

2. Objective: Providing better access to loan facilities

S.no	Scheme	Pertinent Section within policy or scheme	Recommendation
1	Pradhan Mantri Mudra Yojana (PMMY) and Credit Guarantee Fund for Micro Units (CGFMU) under MUDRA, under then Ministry of finance	PMMY enables collateral-free loans up to ₹20 lakh with a government-backed credit guarantee.	Extending this for women buyers/ operators, an EV-specific sub-scheme for women entrepreneurs can be created within MUDRA, offering enhanced guarantee coverage or reduced interest for EV ownership and retrofitting options
2	Digital Lending Guidelines (2022) under the Reserve Bank of India (RBI)	RBI's digital lending framework allows flexibility in repayment design through regulated fintechs and NBFCs.	Customised repayment models for EV gig drivers (especially women) can be introduced, with incentives for timely digital repayments.
3	Priority Sector Lending under the Reserve Bank of India (RBI)	The PSL guidelines mandate banks to guarantee credit lending to certain priority sectors including agriculture, MSMEs, housing, social infrastructure, renewable energy, and education	Include EVs as part of the Renewable energy category of PSL norms. Explicitly including women-owned EV enterprises and driver loans under PSL targets, with interest subvention and simplified documentation.

The EV sector in India holds significant potential to empower women economically and socially. For this to happen we need to build a positive discourse to shift mindsets and treat the E-mobility transition as a generational reset for the automotive industry. By implementing these recommendations across various levels, India can create an environment that supports and nurtures women's participation in the transition to electric mobility. This holistic approach will not only contribute to gender equality but also drive sustainable growth in the EV industry.

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