CLIMATE POLICY INITIATIVE

TECHNICAL BRIEF

Outlook of Future Mobility Jobs Market in India with EV Transition

February 2026

This technical brief targets policymakers, automotive industry stakeholders, and skill development institutions, outlining coordinated actions to build a future-ready workforce for India's transition to clean mobility.

ACKNOWLEDGMENTS

This report is part of ongoing work by Climate Policy Initiative (CPI) on sustainable transport & just transition, aimed at developing knowledge and understanding to support effective decision-making.

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ABOUT CLIMATE POLICY INITIATIVE

CPI is an analysis and advisory organization with deep expertise in finance and policy. Our mission is to help governments, businesses, and financial institutions drive economic growth while addressing climate change. CPI has offices in Brazil, India, Indonesia, South Africa, the United Kingdom, and the United States.

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LIST OF ABBREVIATIONS

ACMs	Auto Component Manufacturers
ASDC	Automotive Skill Development Council
BMS	Battery Management System
CPOs	Charge Point Operators
EVs	Electric Vehicles
e-2W	Electric Two-Wheeler
e-3W	Electric Three-Wheeler
e-4W	Electric Four-Wheeler
e-bus	Electric Bus
e-LCV	Electric Light Commercial Vehicle
e-M&HCV	Electric Medium and Heavy Commercial Vehicle
FAME	Faster Adoption and Manufacturing of Hybrid and Electric Vehicles
GDP	Gross Domestic Product
GHG	Greenhouse Gas
ICEVs	Internal Combustion Engine Vehicles
ITIs	Industrial Training Institutes
MSME	Micro, Small, and Medium Enterprises
MSDE	Ministry of Skill Development and Entrepreneurship
NSDC	National Skill Development Corporation
NSQF	National Skill Qualification Framework
OEMs	Original Equipment Manufacturers
OMC	Oil Marketing Companies
O&M	Operations and Maintenance
QPs	Qualification Packs
R&D	Research and Development

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EXECUTIVE SUMMARY

India's shift toward electric mobility marks a significant turning point for its automotive industry. As the transition progresses, traditional internal combustion engine (ICE) components, such as engines, gearboxes, and exhaust systems will be replaced by clean powertrain components. This shift will alter the structure of the vehicle manufacturing industry, affecting supply chains and reducing demand for many ICE-specific parts. The resulting transformation poses challenges for businesses that rely on ICE technologies in their core operations.

This change will have wide-ranging effects on employment across manufacturing and allied sectors, including repair, servicing, and parts distribution. Many existing roles, especially those centered on ICE systems, may become obsolete. At the same time, the electric vehicle (EV) ecosystem promises new jobs in battery production, power electronics, and software integration. However, these roles require significantly different competencies from jobs in the ICE vehicle sector. To ensure a fair and inclusive transition, it is critical to invest in large-scale skilling and upskilling initiatives that can substantially upgrade workforce capabilities.

CPI's analysis projects that EV sales can reach 44 to 59 million units by FY2047, underscoring the need for a large, skilled workforce to support their production. By FY2047, EV manufacturing, charging infrastructure, and battery recycling are expected to create 5.55–10.36 million direct jobs, with a further 12.88–21.3 million indirect jobs in component supply chains, sales, service, and repair. Assembly and manufacturing alone can create 36 entirely new job roles, due to high requirement of battery technology, power electronics, and digital systems in EVs. Seizing these opportunities will require workforce readiness, with coordinated efforts to reskill existing automotive workers and equip new talent with EV-specific competencies.

CPI recommends a three-pronged approach to mobilize diverse financing for skilling, expand EV-focused training programs aligned with future job roles, and deploy supportive policies that catalyze workforce demand—especially through domestic battery and component manufacturing. Taken together, these measures can enable India to convert its EV ambitions into a resilient, skilled, and competitive mobility workforce fit for the future.

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1. INTRODUCTION

1.1 CONTEXT

The automotive sector, a cornerstone of India's economy, is on the brink of transformation driven by decarbonization to achieve the country's climate goals.

The automotive industry has been pivotal in shaping India's economic trajectory, fostering industrial growth and innovation, employment, and cross-sectoral linkages. Since the delicensing and allowance of 100% foreign direct investment (PIB 2007), the industry has expanded rapidly, increasing its share of national gross domestic product (GDP) from 2.77% to 7% in the last three decades (PIB 2023a). The industry is also a critical employer, supporting nearly 37 million jobs nationally (PIB 2023a) .

Figure 1. Overview of the Indian automotive industry

	AUTOMOTIVE INDUSTRY	AUTO COMPONENTS
Contribution to GDP	**7.1%**	**2.7%**
Livelihood supported	**37 million** (direct & indirect)	**1.5 million** (direct)
Exports	**17.3%** share of total production	**Major Exports market** – US (28%), Germany (7%), Brazil (4%)
Global Rank	**Largest** two and three-wheeler manufacturer	**4%** global market share

Source: *ACMA 2024; ACMA 2025; SIAM 2025*

India is now the third-largest automotive manufacturer globally, manufacturing nearly 31 million vehicles in FY2025 (SIAM 2025). Its vehicle exports had an estimated annual growth rate of 45% between FY2015 and FY2025. The automotive component manufacturing segment forms a foundational pillar for catering to both domestic vehicle demand and exports. In 2024, the segment accounted for 2.7% of India's GDP and supported nearly 5 million skilled and semi-skilled workforce (ACMA, 2025). This growth is driven by supportive policies, including import duties and a strong push for domestic manufacturing under the Automotive Mission Plan (AMP 2016–2026).

The transport sector in India is undergoing a historic shift toward electrification, aligned with the country's climate commitments. Transport is the country's third-largest greenhouse gas (GHG) emitting sector, accounting for around 14% of energy-related carbon emissions in 2020. Of this, road transportation, including passenger and freight, comprises more than 92% (CEEW 2022). This necessitates cleaner alternatives, with electric vehicles (EVs) emerging as a promising option given their zero tailpipe emissions.

Policy interventions have played a central role in accelerating EV uptake nationwide. Flagship schemes such as the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) I and II schemes

launched in 2015 and 2019, respectively, and the PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM e-DRIVE) operational since 2024, have supported both demand creation and charging infrastructure deployment. As global EV markets evolve and new manufacturing hubs emerge, India could consolidate its domestic EV ecosystem while strengthening its competitiveness in the international auto component supply chain. These capabilities will be pivotal for capturing value in a rapidly transforming global mobility landscape.

EV transition can generate revenue of USD 100 billion from 2023 to 2030 in India (Bain & Company 2023). The transition offers new employment opportunities in emerging industry segments, including battery manufacturing and charging infrastructure, while also reducing GHG emissions and strengthening energy security. India's ambition to achieve a 30% EV sales share by 2030 and progress toward the vision of Atmanirbhar Bharat (Self-reliant India) by 2047 could support these outcomes (PIB 2023b).

The shift to EVs will significantly disrupt the automotive sector. Studies indicate that ~90-100% of the powertrain components in an internal combustion engine vehicle (ICEV) may become obsolete as EV powertrain replaces engines, transmissions, and associated subsystems with batteries and electric motors (iForest 2024). Traditional ICEV automotive component manufacturers (ACMs) may face reduced demand and shrinking product portfolios, which could affect their workforce. The impacts could extend beyond manufacturing, affecting those employed in downstream services such as the maintenance and repair of ICEVs.

As manufacturing shifts to complex electric drivetrains, having skilled workers across the board will be critical to achieving EV adoption targets. EV value-chain manufacturing will drive demand for battery production, power electronics, and software integration. New technologies, coupled with increasing automation, will require a workforce equipped with advanced, specialized skills. Jobs will also increase in R&D and quality engineering, which are critical to ensuring EV and component quality standards.

Meeting this demand requires a comprehensive assessment of workforce composition, skill requirements, and the capabilities of India's skilling infrastructure. A coordinated, forward-looking strategy for reskilling and workforce development, paired with targeted investment, can evolve the skilling ecosystem in line with industry needs, fostering a fair, inclusive, and sustainable transition.

1.2 STUDY OBJECTIVE

India has set a vision to become a *Atmanirbhar Bharat* (Self-reliant India) by 2047, placing energy independence and self-reliance at the core, as it marks 100 years of independence (PIB 2021; IECC 2022). This ambition, alongside India's commitment to reach net-zero emissions by 2070 (PIB 2023b), is steering a decisive shift towards domestically produced, clean energy sources in all sectors, including transport. Delivering on this transition will require accelerated action well before 2070, with 2047 emerging as a critical milestone given the long investment cycle across energy, transport, and industrial systems.

This brief examines how a full transition to electric vehicles by FY2047 could reshape employment patterns in India and the associated skill-development needs. It analyzes shifts in occupations across the EV manufacturing value chain and identifies skill gaps that need to be addressed. By evaluating existing skilling ecosystem, and training requirements, the brief offers recommendations to support India's transition toward a sustainable, future-ready mobility workforce. Through data analysis, policy review, and stakeholder consultations, this study seeks to:

- **Assess the employment implications** of India's accelerated EV adoption by FY2047 by quantifying both direct and indirect jobs across the mobility value chain.
- **Identify emerging job roles** in EV manufacturing and compare current skill capabilities with the requirements of an EV-driven ecosystem.
- **Assess the adequacy of existing training courses/programs** and identify opportunities to strengthen the EV workforce skilling.
- **Provide recommendations for decision makers** to enable an inclusive and equitable transition for India's automotive sector.

The report is structured as follows:

- **Section 2** provides an overview of the Indian automotive industry, the impact of EV transition on employment globally and in India, and the current skilling landscape.
- **Section 3** presents detailed findings on direct and indirect jobs generated with EV adoption.
- **Section 4** assesses the skill requirements across EV job roles and identifies gaps in the current skilling ecosystem.
- **Section 5** provides actionable recommendations for policymakers, skill development agencies, and industry stakeholders to enable an equitable and future-ready workforce transition.

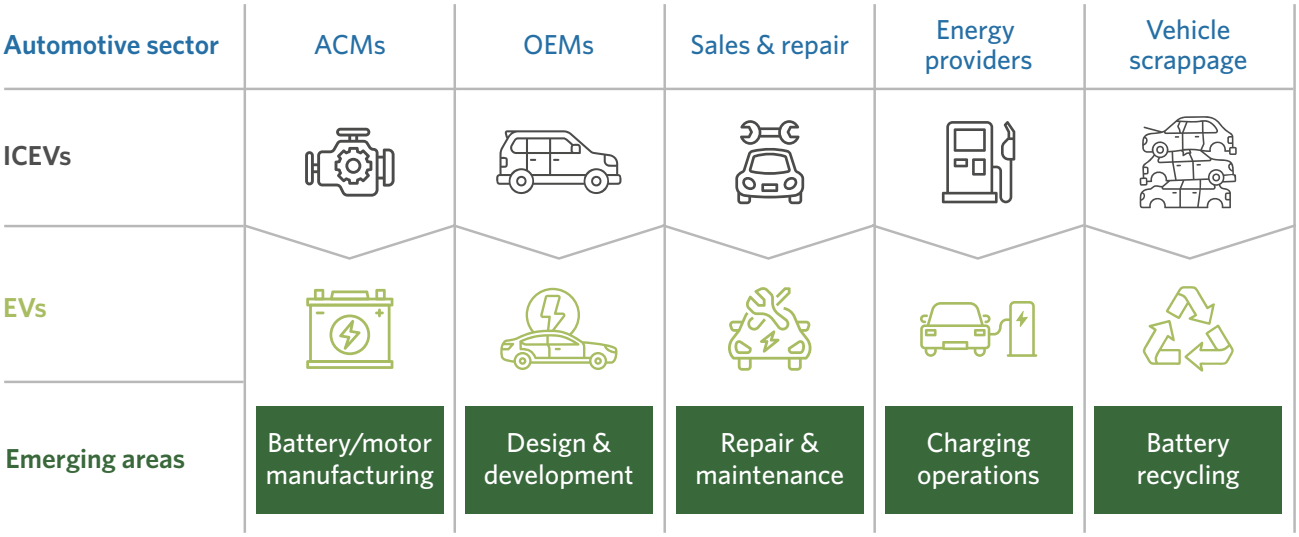
2. EV TRANSITION RESHAPING JOBS

The accelerating transition to clean mobility is reshaping workforce needs, industry structures, and value chain dynamics across the global automotive sector. As India advances EV adoption, it is essential to assess how different value-chain actors and industry segments will be affected. This section provides an overview of the value chain actors in India's automotive industry; the impact of the EV transition on employment, globally and in India; and the current landscape of India's skilling ecosystem.

2.1 BUILDING BLOCKS OF THE AUTOMOTIVE INDUSTRY

The automotive industry operates through a highly integrated value chain, with each actor playing a distinct role in the vehicle lifecycle. As shown in Figure 2, original equipment manufacturers (OEMs) anchor this ecosystem by leading product conceptualization and setting the strategic direction for downstream processes. Their operations are supported by a broad base of auto component manufacturers (ACMs) that supply critical parts for vehicle assembly. Sales dealerships serve as the vital link between OEMs and customers, managing retail, customer interactions, and financial support.

Figure 2. Overview of the automotive value chain and actors



Source: *CPI analysis*

The operational phase of the vehicle lifecycle is supported by refueling infrastructure, aftersales, and service partners. Oil marketing companies (OMCs) develop the retail fueling network for ICE vehicles (ICEVs) to ensure the continuous availability of fuel, forming a critical part of the vehicle's operational supply chain. Service stations support vehicle upkeep through authorized OEM service centers and an informal ecosystem of independent garages and roadside mechanics. As India transitions from ICEVs to EVs, this traditional structure is reconfiguring, with new actors emerging. For instance, energy utilities and charge point operators (CPOs) now perform roles once held by fuel retailers, changing how vehicles are powered.

Table 1. Impact of EV transition on value chain actors

Value Chain Actor	Opportunities	Challenges
OEMs	• Innovative startups to capture market demand	• High upfront investment in R&D, retooling plants
ACMs	• Localization of high-value EV components	• High risk of obsolescence for ICE-related components
Dealerships	• Expand services with EV-specific financing	• Limited EV-specific product knowledge for customer acquisition
Service stations & aftermarket	• Integrate into a more formal, OEM-aligned servicing ecosystem	• Reduced revenue from after-sales service & parts • Mechanics require training to handle high-voltage systems
Energy Providers/ OMCs	• Diversify revenue by installing EV chargers and offering EV-related services	• Decreased revenue from fossil-fuel sales

Source: *CPI analysis*

2.1.1 JOB ROLES IN VEHICLE ECOSYSTEM

The entire ICEV and EV value chain comprises 564 job roles, spanning research and development (R&D), manufacturing, and service and repair, as shown in the table below. Manufacturing accounts for over half of the roles, while service and repair roles form the second-largest segment (16%), reflecting the sector's dependence on servicing support. R&D functions further reinforce the manufacturing base by enabling design, innovation, and process improvements that are essential to a competitive EV transition.

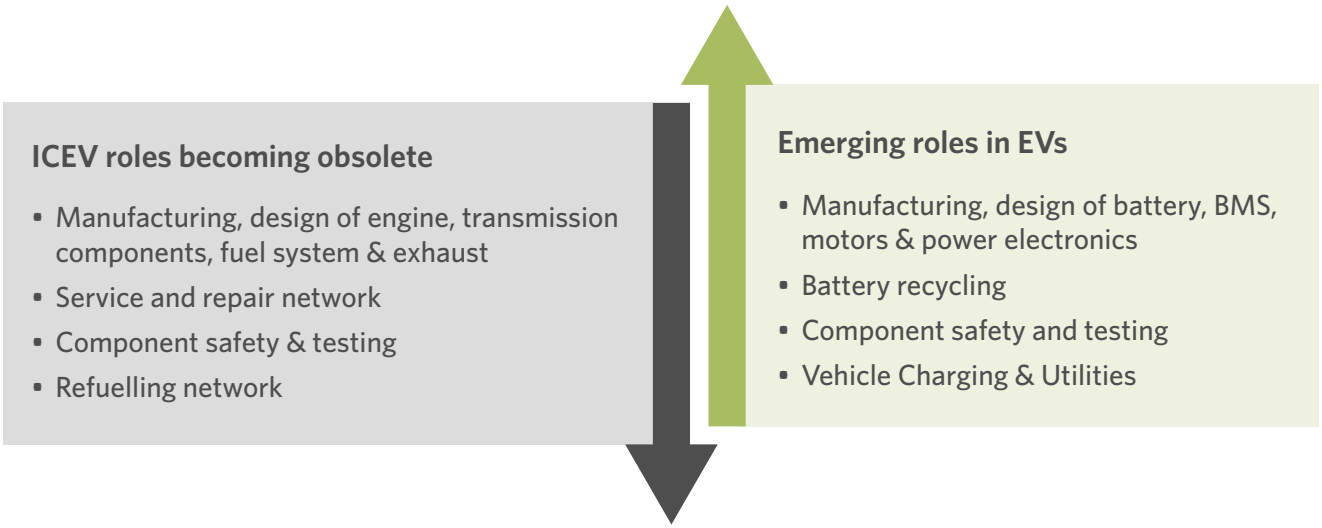
Table 2. Job roles in the automotive ecosystem

Segments of the automotive ecosystem	Number of job roles
Dealership	59
EV charging/Fuel pumps	21
Manufacturing	304
Research & Development	75
Service/Repair	90
Supply chain and logistics	15
Total	**564**

Source: *iForest 2024*

Manufacturing processes for ICE and EVs exhibit substantial overlap in components such as chassis and body assembly and in electrical and mechanical systems (e.g., steering and braking). However, the powertrain is a major point of divergence. In EVs, batteries, electric motors, and power electronics replace the engine and fuel system as the core value drivers, and the manufacturing of these components is creating new job roles. The electronics-driven and digitally integrated EV value chain is creating a new industrial structure that requires significant technological and workforce adaptation.

Figure 3. Segments with ICEV roles becoming obsolete and emerging roles in EVs



Source: *CPI analysis*

2.2 IMPACT OF EV TRANSITION ON EMPLOYMENT

Electric mobility is unlocking significant growth opportunities for the global automotive workforce as the automotive sector accelerates its transition to cleaner technologies. In 2024, EV sales (including battery operated, fuel cell and pure hybrid EVs) exceeded 28 million units, with China, the EU, and the US accounting for almost 85% of global demand (IEA 2025). Battery and EV manufacturing contributed 27% of the 1.5 million new jobs linked to clean energy in 2024 alone (IEA 2024a), emerging as some of the fastest-growing segments of industrial employment worldwide.

2.2.1 IMPACT ON JOBS GLOBALLY

Globally, the EV transition is reshaping workforce demand across major automotive markets. EV manufacturing and battery manufacturing sectors witnessed substantial growth in 2023, accounting for almost one-third of the total clean energy jobs in 2023 (IEA, 2024a). China, the world's largest automotive employer, with nearly 5 million jobs, is rapidly expanding domestic EV manufacturing capacity. In 2023, China alone hosted about 70% of the total jobs in EVs and batteries and 73% of the increase in jobs in the EV ecosystem (IEA, 2024a).

Studies in the United States have noted that EV assembly can require up to ten times more workers during the initial years than ICEV production, and nearly three times more even after a decade, when including

battery production (Weng et al, 2024). As a result, countries localizing battery and EV manufacturing would observe net job gains, offering long-term employment potential in clean mobility.

Table 3. Estimated job creation potential in EV manufacturing

Country/ region	Existing jobs in automotive sector	Estimates of job creation potential in EV manufacturing	EV segments
China	5 Mn	• 10 Mn direct and indirect jobs by 2030	• EV manufacturing • Charging/swapping related services
EU	3 Mn	• 0.1 Mn jobs by 2030 • 0.12 Mn jobs by 2035	• Battery cells production • Charging infrastructure
US	2.6 Mn	• 3-10x more workers than ICEV • 0.12 Mn jobs by 2030	• EV and battery manufacturing, charging infrastructure

Source: *IEA 2024a; Weng et al. 2024; HiredChina 2025; Transport & Environment 2025; ICCT 2025a*

Unfortunately, workers in ICE-intensive subsectors like engine and gearbox manufacturing, fuel-system assembly, and maintenance face the steepest displacement risks (OECD 2025). Conversely, in-demand job roles for EVs, such as battery, R&D, software, and digital services, have higher skill intensity and require retraining. For instance, in Indonesia, low-skilled operator roles will decrease by 40% as vehicle production becomes more technologically complex (Mubarok and Kartini 2023).

2.2.2 IMPACT OF EV TRANSITION ON JOBS IN INDIA

In India, the transition to EVs pose structural risks to traditional employment patterns. Estimates suggest that 31% of existing roles in India's automotive value chain could be directly affected by electrification, with 14% of roles at risk of becoming obsolete and 17% requiring substantial reskilling to remain relevant. The impacts are most pronounced in ICEV manufacturing, where approximately 21% of job roles could face a high risk of obsolescence (iForest, 2024).

At the same time, electrification is creating a new spectrum of job opportunities. National estimates signal a strong workforce demand. The Economic Survey 2023 highlights that the EV industry will create 50 million direct and indirect jobs by 2030, while industry assessments highlight the need to double annual EV workforce intake to 30,000 trained workers to meet localization targets (Ministry of Finance 2024; MSDE 2025).

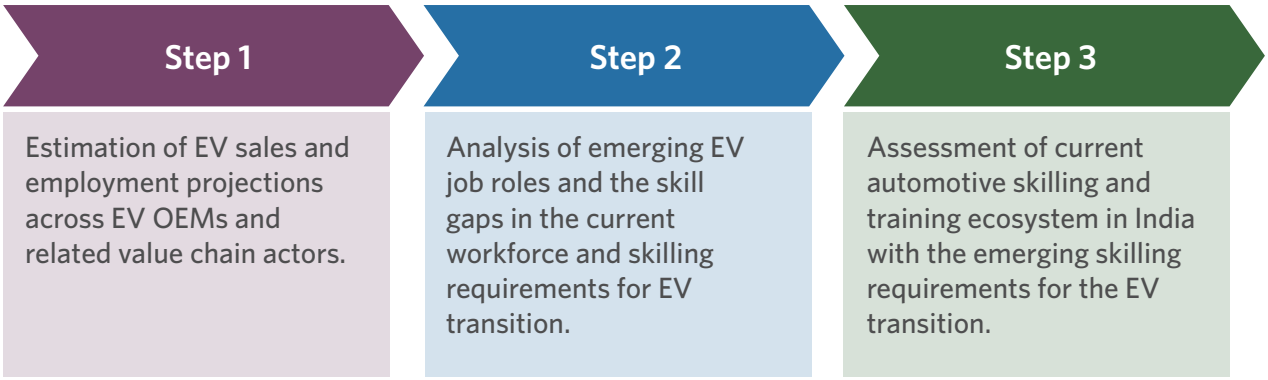
However, the shift also demands a major upgrade in workforce capabilities. Given that 43% of ICE technical skills have minimal overlap with EV needs, many current workers will require training, and 27% of roles will require reskilling (Manufacturing Today 2024). Yet formal technical training remains limited: over half of workers in vehicle and component manufacturing lack a formal technical education, and 93% of employees in service and repair lack formal training (MSDE 2025). Since 70% of ACM employment stems from micro, small, and medium enterprises (MSMEs), addressing these skilling requirements is critical (McKinsey & Company 2025). Building workforce readiness now is critical to safeguard jobs and ensure a smooth transition as transport electrification accelerates in the coming years.

India can strengthen both formal and informal vocational training systems to avoid employment dislocation, particularly among MSMEs and the informal service ecosystem. Global evidence shows that countries that localize production of batteries and other critical EV components are best positioned to capture job growth. At the same time, those that fail to build domestic capabilities risk losing employment to more competitive markets. India therefore faces a dual imperative: scaling workforce capacity in emerging EV domains while simultaneously reskilling its existing automotive workforce and developing a new pool of high-technology talent to support long-term competitiveness. Proactive skilling efforts, strategic industrial policies, and sustained investment can help secure a skilled workforce and a sustainable transition to electric mobility.

3. ANALYSIS

Most studies on EV transition and labor market shifts in India rely on secondary data and focus on manufacturing, though impacts extend to secondary and indirect markets. To fully understand the effects of the EV transition and the state of the current skilling ecosystem in India, CPI conducted multiple consultations with stakeholders across the manufacturing, sales, and service sectors. The study estimated the employment-generating potential of the EV transition and analyzed future skilling requirements associated with the shift to electric mobility using a three-step methodology.

Figure 4. Approach to assessing the workforce and skilling requirements with EV transition



The following sections in this chapter present results from Step 1 of this framework on the estimation of the potential employment generated in EV manufacturing and the associated value chain. Chapter 4 examines results from Step 2 and 3 from the framework on identification of emerging job roles, their skill requirements, and assessment of the current skilling landscape in India.

3.1 SCENARIOS OF ANALYSIS

Two EV adoption scenarios were developed (explained in Table 4) with different penetration targets across vehicle segments by FY2047 to evaluate the impact of accelerated EV adoption. For both scenarios, the same EV sales growth and fuel mixes are projected until 2030, considering the government's target of achieving 30% EV penetration by 2030 and reflecting current policy momentum supporting EV adoption (PIB 2023b). Table 5 presents the assumed EV sales penetration from FY2026 to FY2047 across vehicle segments under the developed scenarios.

Table 4. Scenarios for EV adoption

Scenario	Description
Business-as-usual (BAU)	• Under the BAU scenario, long-term EV penetration targets are set beyond FY2030 to achieve 73% overall sales penetration by FY2047. • Annual EV penetration levels are estimated using the compound annual growth rate (CAGR), based on the defined FY2030 and FY2047 targets.
100% EV adoption	• This more ambitious scenario frames mobility transition as an integral part of India's long-term development pathway by projecting 100% EV adoption by FY2047. • EV adoption levels of different countries undergoing similar mobility transitions are studied to estimate India's EV trajectory based on this optimistic target.

Source: *CPI analysis*

Table 5. Assumed EV sales penetration across vehicle segments under each scenario

Vehicle segments	FY2030	FY2035		FY2040		FY2045		FY2047	
		BAU	100%EV	BAU	100%EV	BAU	100%EV	BAU	100%EV
e-2W	33%	43%	70%	56%	100%	72%	100%	80%	100%
e-3W	45%	54%	80%	65%	100%	79%	100%	85%	100%
e-4W	18%	24%	50%	33%	80%	44%	100%	50%	100%
e-bus	15%	20%	35%	27%	65%	36%	88%	40%	100%
e-LCV	15%	21%	45%	30%	75%	43%	100%	50%	100%
e-MHCV	5%	9%	20%	17%	60%	31%	86%	40%	100%
e-Tractor	5%	9%	12%	17%	29%	31%	70%	40%	100%
Total EV share	**30%**	**39%**	**65%**	**50%**	**94%**	**65%**	**99%**	**73%**	**100%**

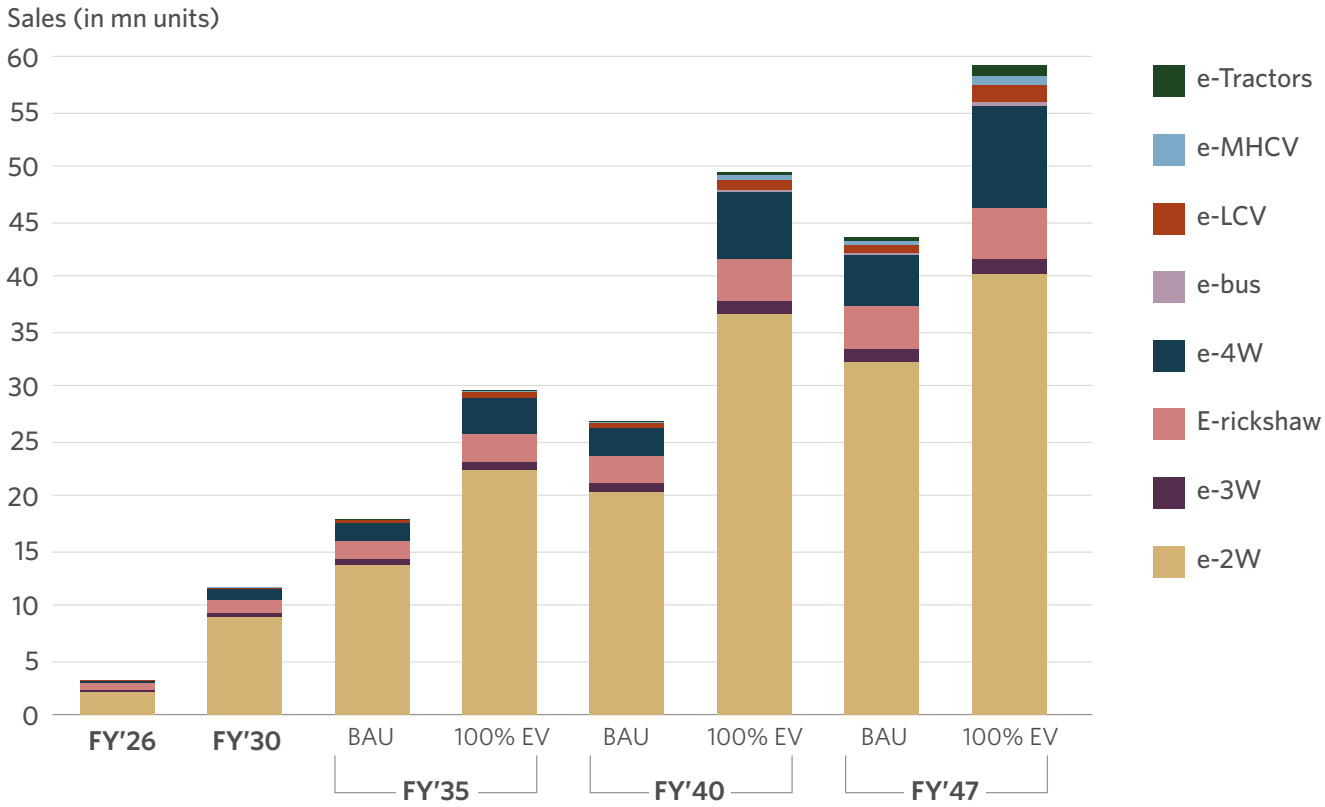
Source: *CPI analysis*

3.2 OUTLOOK OF EV SALES IN INDIA BY FY2047

India's EV transition has accelerated rapidly in recent years, with adoption patterns varying across segments depending on duty cycles, incentives, and cost dynamics. Between 2019 and 2025, the EV market expanded more than thirteenfold, underscoring the pace of change underway (Vaahan 2025; Telangana RTO 2025). To forecast India's vehicle sales, this study uses the Gompertz function, which models how vehicle ownership grows with a country's economic development (Singh et al. 2019). EV sales are estimated by applying projected segment-wise penetration rates to forecasted vehicle sales under the defined adoption scenarios. Further details on the methodology and assumptions are provided in the Annexure Table A2.

CPI's analysis highlights that India's EV sales can achieve accelerated growth, increasing from 2 million units in FY2025 to 11.6 million by FY2030 and to 44 million by FY2047 under a BAU trajectory. Achieving a full transition to EVs by 2047 could raise annual sales to 59 million, with light EVs, including electric two-wheelers (e-2Ws) and electric three-wheelers (e-3Ws), expected to dominate due to lower costs and a strong domestic manufacturing base. However, as India's per-capita income rises, household mobility preferences and private vehicle ownership are likely to shift from 2Ws to cars (Singh et al. 2019). Coupled with electrification, this can position electric four-wheelers (e-4Ws) as the fastest-growing segment, increasing their market share from 6% in FY2025 to 16% by FY2047. Figure 5 presents projected EV sales across all vehicle segments for FY2026–FY2047, anticipating market trends, policy interventions, targets, and charging infrastructure expansion.

Figure 5. Projected EV sales across vehicle segments



Source: *CPI analysis*

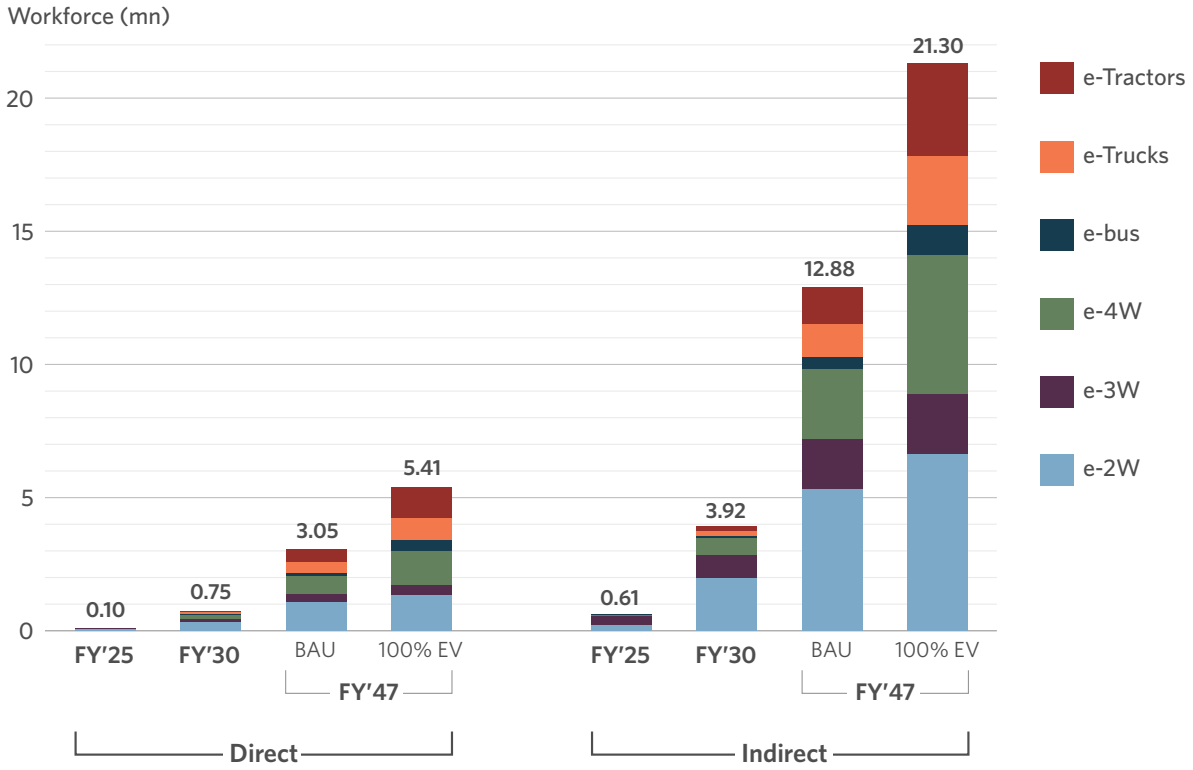
3.3 WORKFORCE IMPACT ASSESSMENT

Understanding emerging roles and workforce requirements under India's EV transition is critical for informed planning, targeted talent development, and effective upskilling strategies. This section outlines the expected workforce impacts, including potential job creation and shifts in manufacturing roles as EV technologies scale. The analysis considers both direct[1] and indirect[2] employment involved in EV manufacturing, along with direct jobs in public charging infrastructure and EV battery recycling, to present a comprehensive view of India's evolving EV workforce landscape.

3.3.1 JOBS IN THE VEHICLE MANUFACTURING ECOSYSTEM BY FY2047

Figure 6 highlights that India's EV transition could unlock substantial new employment opportunities by FY2047. Direct jobs in EV manufacturing could rise from 0.10 million in FY2025 to 5.41 million under a 100% EV scenario, while indirect jobs could expand from 0.61 million to over 21 million. Driven by their high sales volume, e-2Ws and e-3Ws are expected to account for more than two-thirds of direct and indirect employment through FY2030. In contrast, job creation in heavy vehicle segments of e-buses, e-trucks, and e-tractors is projected to remain low initially but to accelerate significantly by FY2047 as demand rises and domestic manufacturing deepens.

Figure 6. Current and projected (a) direct and (b) indirect workforce in EV manufacturing



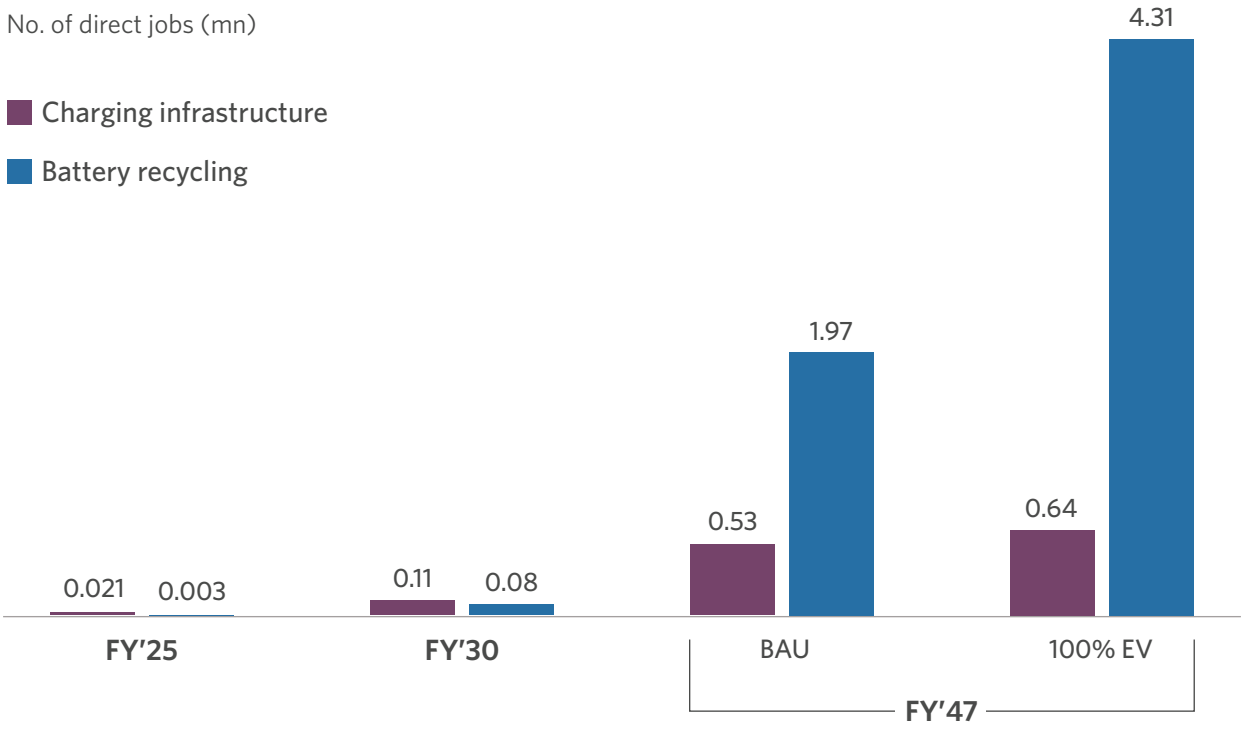
Source: *CPI analysis*

1 Direct jobs under the analysis refer to employment generated within core automotive operations, including vehicle design, manufacturing, plant operations, and supply chain management.
2 Indirect jobs lie outside OEMs but support the automotive ecosystem, including component manufacturing, dealerships, after-sales service, logistics, and warehousing.

3.3.2 JOBS IN OTHER VALUE CHAIN ACTORS BY FY2047

As the nationwide deployment of charging infrastructure accelerates, directs jobs in public charging could expand at a CAGR of 17% from roughly 21,000 in FY2025 up to 650,000 in FY2047, as shown in Figure 7. These jobs will span across charger manufacturing, power utilities, installation, and operation and maintenance (O&M) services. Moreover, as India establishes a regulated recycling ecosystem with stricter compliance with extended producer responsibility norms, direct employment in battery recycling is projected to scale to between 1.97 million and 4.31 million by FY2047. These jobs would be housed within recycling facilities for core technical functions, such as dismantling, sorting, material recovery, process control, etc. Strengthening circular-economy systems and accelerating the deployment of charging infrastructure can unlock this employment opportunity.

Figure 7. Projected workforce in EV charging infrastructure and battery recycling



Source: *CPI analysis*

4. EV JOB ROLES AND SKILLING REQUIREMENTS

As vehicle architectures and manufacturing processes shift, workforce capabilities must evolve in parallel to ensure sectoral competitiveness and resilience. This section summarizes CPI's analysis of emerging job roles and evolving skill requirements. It also highlights key skill gaps within the current workforce and gaps in the existing skilling ecosystem that must be addressed to support the EV transition.

4.1 JOB ROLES FOR EV OEMS

CPI mapped 147 key job roles (white- and blue-collar) across OEM manufacturing, R&D, supporting supply chain functions, corporate functions, and sales and service. While around 75% of EV OEM roles—primarily support functions—overlap with ICE roles, the transition creates demand for new capabilities. CPI identifies 36 new EV-specific roles in battery engineering, electronics, motor design, and drivetrain development. As shown in Table 6, new components of battery, motor, and drivetrain are expected to account for 17% of manufacturing roles. R&D encompasses 19% of manufacturing roles, highlighting the growing centrality of advanced design and product development in electric drivetrains, positioning innovation capability as pivotal to increasing production capacity.

Table 6. Distribution of EV OEM job roles under different functions

Function	Aspect	Number of job roles	Overlapping ICEV/EV roles
Component specific	Battery related	10	0
	Chassis and body parts	7	7
	Electronics & control system	4	0
	EV motor & drivetrain	4	0
Design	R&D (excluding battery)	16	11
OEM operation	General purpose /Assembly line	27	25
	Machining roles	4	4
	Plant and equipment O&M	8	7
	Quality Control	5	5
Support functions	Supply Chain	13	9
	Sales and services	25	20
	Corporate functions	24	23
Total		**147**	**111**

Source: *CPI analysis*

4.1.1 SKILLS AND COMPETENCIES FOR EV ROLES

Unlike the ICE vehicle ecosystem's dominance by mechanical skill sets, technologically advanced EVs demand interdisciplinary fluency, with software and electrical competencies underpinning nearly every role. Growing domestic battery manufacturing can drive demand for cell-line engineers and battery pack and battery management system (BMS) designers who require a blend of chemical, electrical, and thermal engineering competencies. In contrast, niche roles in power electronics, motor design, and validation will require advanced mechatronics and integration skills.

Core competencies in vehicle manufacturing will include high-voltage diagnostics, battery testing, State of Health (SoH) monitoring, power-electronics integration, and functional safety. Charging-infrastructure roles will need electrical installation and information technology literacy, and communication protocols. Retail and sales functions require a deeper understanding of EV technologies to enhance customer experience. Figure 8 provides a snapshot of major EV roles and their associated skill requirements. A detailed summary of key EV value chain segments and the required skillsets and expertise is provided in Annexure Table A4.

Figure 8. Emerging job roles and skill requirements

Role	Skill requirements
Battery cell manufacturing engineer	Electrode coating, cell grading; Cell assembly and testing; High voltage safety
Battery pack and BMS designer	Battery pack architecture & cell selection; Thermal management; Electronics H/W design, Embedded systems
Battery cell chemistry expert	Electrochemistry; Advanced materials; Computational tools
Power electronics engineer	Power electronics; Embedded systems; High voltage safety
Motor design engineer	Modelling and simulation; Thermal management & structural design; Electric and Magnetic materials
EV systems integration	Powertrain architecture; Thermal and electronic control systems; High voltage & functional safety & testing
Assembly technician	Battery, Power train & controller assembly; Functional and HV safety; Diagnostics skills
Supply chain specialist	Critical materials sourcing/demand planning; EV supplier development and costing; ESG and sustainable procurement practices
Charging equipment installer	Networking and communication protocols; Power electronics, software skills; HV voltage and functional safety
Battery recycling specialist	Cell chemistry expertise; Hydrometallurgy/ Pyrometallurty; ESG /safe handling materials

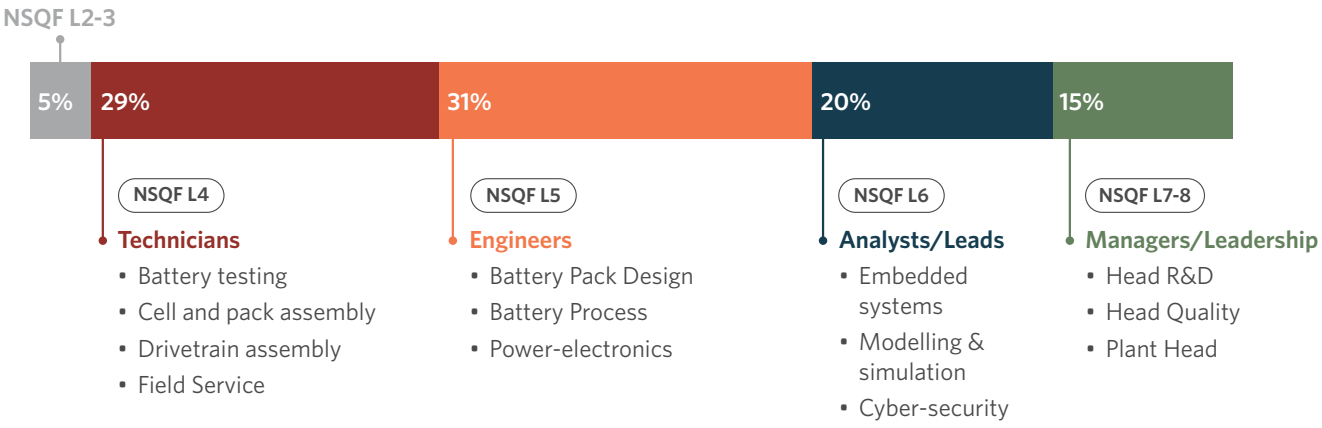
Source: *CPI analysis*

Further analysis, based on skill complexity and autonomy under the National Skill Qualifications Framework (NSQF), shows that most EV roles fall between levels 4 and 7. Compared to conventional ICE value chain, the EV value chain calls for more specialized and technical roles falling in NSQF levels 5-7, owing to advanced electromechanical nature of EV systems. Figure 9 provides an overview of the indicative roles across different NSQF levels and the indicative share among the 147 roles analyzed by CPI.

Around 29% of roles will be at level 4, largely comprising technician functions. About 51% of roles could align with levels 5-6, reflecting advanced engineering and associate-level responsibilities, while 15% fall

under levels 7-8, covering managerial, R&D, and leadership functions. The EV workforce could experience increasing demand for higher NSQF levels due to rapid electrification, localization of key components, and stricter regulations, which drive demand for high-precision, technology-intensive roles.

Figure 9. EV roles across NSQF levels



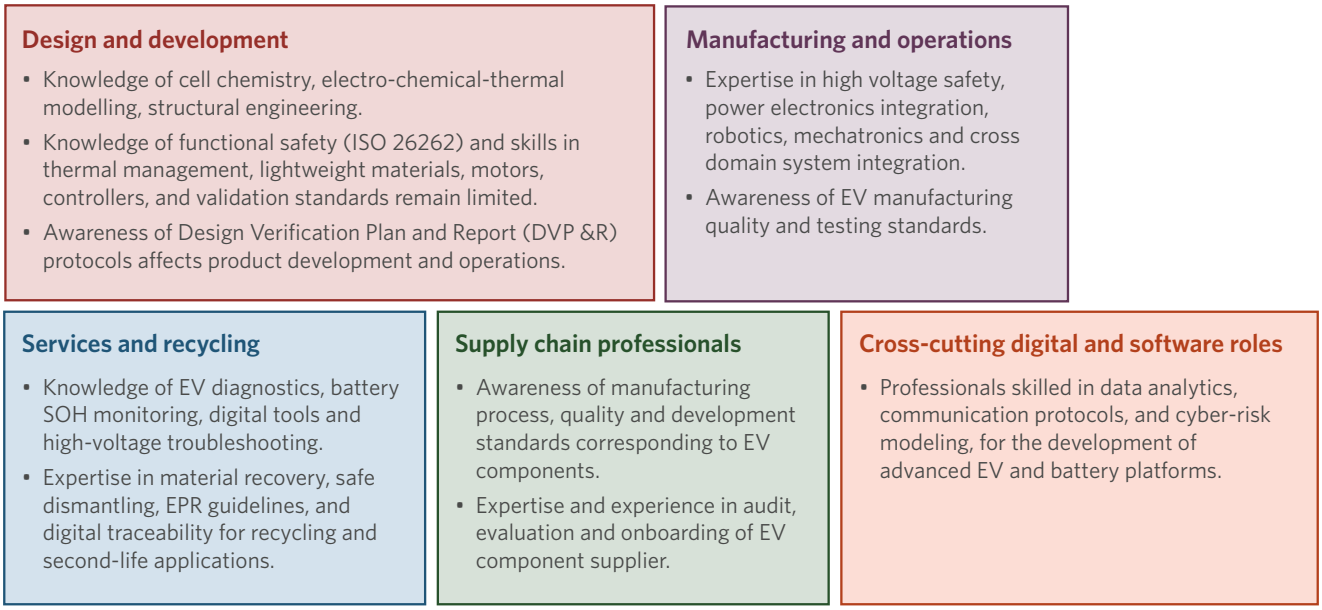
Source: *CPI analysis*

4.1.2 IDENTIFIED SKILL GAPS

CPI's assessment of skill gaps in the EV value chain, based on industry consultations and secondary research, found acute shortages in specialized EV roles. These include roles in the design and engineering of new components, such as battery cells and pack design, BMS development, power electronics, embedded systems, and battery recycling, as well as cross-cutting IT/software functions. Skill gaps also dominate in transitional roles, such as mechanics, line operators, and quality engineers, where there is an additional need for expertise in high-voltage systems, data analysis, and the skill sets of the ICE ecosystem.

These gaps could widen as EV adoption accelerates, driven by leaner assembly lines and greater reliance on robotics, mechatronics, and digital systems. EV-specific training interventions can help prevent talent shortages and raise acquisition costs for OEMs and allied sectors, including component manufacturers and charging infrastructure providers. Figure 10 summarizes the skill gaps across the EV value chain to chart clear requirements and pathways for skill development.

Figure 10. Skill gaps to be filled across the EV value chain



Source: *Stakeholder Consultation, OMI 2022; AEEE 2024*

4.2 AUTOMOTIVE SKILLING ECOSYSTEM IN INDIA

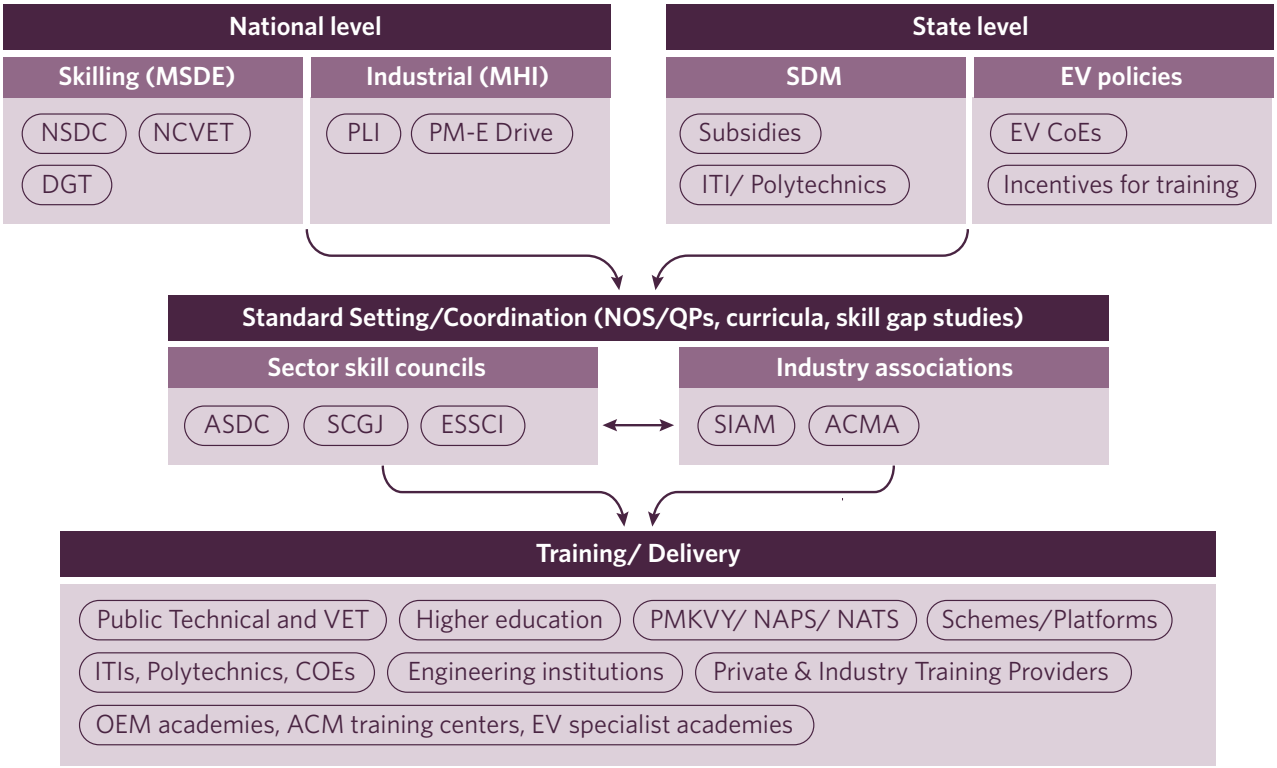
India's automotive skilling ecosystem operates through coordinated efforts across national, state, and industry levels.

National Level: The Ministry of Skill Development and Entrepreneurship (MSDE) anchors national skilling initiatives, supported by institutions such as the National Skill Development Corporation (NSDC), the Directorate General of Training (DGT), and the National Council for Vocational Education and Training (NCVET). Foundational frameworks like the National Policy on Skill Development & Entrepreneurship and NSQF govern curriculum standards, occupational roles, and certifications. The Automotive Skills Development Council (ASDC), under NSDC, designs Qualification Packs (QPs) and competency standards and has developed over 160 QPs for the automotive sector in collaboration with industry stakeholders.

State level: State governments complement national efforts through skill development missions and EV-focused policies. Several states have incorporated skilling as a key component of their industrial and EV policies, offering capital subsidy for skilling infrastructure and reimbursing skilling expenditure. In addition, states are establishing EV Centers of Excellence within Industrial Training Institutes (ITIs) and engineering institutions, in partnership with industry partners. Training delivery is supported through a vast network of public and private training institutions across India. India's skilling backbone comprises over 15,000 ITIs and 3,500 polytechnics delivering long-duration vocational programs and short-term courses under Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and state missions (CDPHL 2023; NITI Aayog 2023).

Industry level: Large automotive OEMs and ACMs in the country further strengthen the ecosystem through training academies, skill enhancement centers, and apprenticeships. Schemes like the National Apprenticeship Training Scheme (NATS) and the National Apprenticeship Promotion Scheme (NAPS) further support work-based skilling in manufacturing units, ensuring alignment with emerging EV technologies (NSDC 2016). Figure 11 provides a snapshot of the automotive skilling ecosystem in the country.

Figure 11. Overview of automotive skilling ecosystem in India



Source: *CPI analysis*

4.2.1 SKILLING COURSES AND PROGRAMS

The ASDC plays a pivotal role in aligning workforce skills with industry needs by curating and delivering EV-focused courses through its nationwide training partners. Vocational institutes and universities have introduced certification programs and postgraduate courses on EV technology for professionals, while several OEMs offer specialized training in diagnostics, maintenance, and EVSE installation (Autocar 2025). Current EV course offerings in India broadly fall into two categories: short-term certifications and advanced postgraduate diploma programs. Table 7 spotlights some of the currently available skilling programs across key core competencies/domains (see Annexure Table A5 for detailed list of courses).

Table 7. Short- and long-term EV courses and programs offered in India

Short-term programs	Long-term programs
EV-battery-motor-powertrain	
EV technology	• Online Postgraduate Diploma in EV technology • Executive Program on Electric Vehicle Design and Development • Electric Vehicle Advanced Power Electronics Executive Program • Postgraduate Certification in Hybrid Electric Vehicle Design and Analysis
• Fundamentals of EV technology and Industrial transition • Certificate course in EV technology	
Battery technology	

Short-term programs	Long-term programs
• Professional Certification Program in Battery Technology and Powertrain Engineering • BMS Certification Course	
Motor/Powertrain	
• Professional Certification Program in Motor Drive Systems & Control Systems • Professional Master Certification Program in EV Powertrain Architecture	
Embedded systems/ Power electronics	
• Electric Vehicle Advanced Power Electronics Executive Program	• Postgraduate Program in Electric Vehicle & Embedded Systems Advanced Engineering
Service/ Charging infrastructure	
• Certified EV technician program • Professional Certification Program in Charging Technologies and Hydrogen Fuel Cell Systems	• Postgraduate Diploma Course in Smart Grid Technologies
Data analytics/ Cyber risk	
• Data Science and Engineering Analytics for EVs	• Executive Program for Cybersecurity

Source: *CPI analysis*

Short-term certification courses can provide upskilling for job roles that have overlapping functions with conventional ICE operations, such as line maintenance specialists, automation specialists, and sales managers. Certain EV-specific roles at NSQF levels 4–5, such as field service and battery testing technicians, can also be reskilled through short programs in EV layout, electronics, and high-voltage diagnostics, with an average cost of INR 19,000 per person. In addition to on-the-job training and e-learning modules provided by private training partners, the National Program on Technology Enhanced Learning offers a range of technical education modules online, available free of cost to any individual.

Highly technical and managerial roles (NSQF levels 6-8), such as vehicle integration engineers, battery pack production line managers, and quality managers, would require advanced skill development, including postgraduate diplomas/executive degrees. Leading educational institutions, such as the Indian Institutes of Technology (IITs) and private training partners, also offer postgraduate diplomas, certifications, and executive programs in EV systems and technology, tailored to upskilling working professionals.

While there is a growing number of short-term and diploma courses in the EV domain, there is a lacuna of specialization programs for developing core expertise in key technologies. Advanced specialization programs will be key for critical technical and leadership positions. These include critical functions and domains, such as vehicle integration, automotive power electronics, battery pack design, battery recycling, automotive embedded systems, and EV cost engineering, which require subject-matter expertise.

4.2.2 GAPS IN THE SKILLING ECOSYSTEM

Despite multiple national and state-level initiatives, India's automotive skilling ecosystem is not keeping pace with rapid technological advancements in the EV sector. CPI's analysis and stakeholder consultations

highlight critical gaps across the value chain (Figure 12), including inadequate alignment of curricula with emerging EV technologies, limited availability of specialized programs, and insufficient capacity for advanced skilling. Bridging these gaps could strengthen training infrastructure to provide a trained workforce in tandem with the evolving industry requirements.

Figure 12. Critical gaps in the automotive skilling ecosystem

ICE-heavy curricula

- Most ITIs and vocational institutions deliver predominantly ICE-related training, with fewer modules on power electronics, semiconductors, charging infrastructure, and battery technologies.
- Of the total 161 Qualification Packs (QPs), only 18 are EV-related.

Inadequate training infrastructure and lab capacity

- Training infrastructure at ITIs, polytechnics, and private centres have not grown at the same pace as EV demand, leading to limited hands-on learning experience.
- Particularly limited infrastructure suiting high-voltage batteries, chargers, inverters, motor controllers, battery diagnostic tools, thermal rigs, and simulation.
- Shortage of certified trainers with EV domain experience and inadequate incentives for engineers to transition to training roles.

Limited transparency on training investment and outcomes

- Companies do not always disclose internal learning and development progress and number of employees trained on key skills.
- Lack of publicly available financial and impact data on metrics such as placement rates, wage outcomes, or long-term employment trajectories for EV-trained candidates.
- This lack of visibility makes it difficult to assess the adequacy of national skilling investment.

Source: *CPI analysis, Stakeholder consultation*

4.2.3 SKILLING INVESTMENT

As the automotive sector undergoes structural shifts, workforce readiness will define the pace and sustainability of India's EV transition. Investing in skilling infrastructure, curriculum modernization, and trainer development is critical to leapfrog existing gaps and prepare talent for evolving industry needs. However, mobilizing the required capital demands coordinated action across stakeholders. Global experience shows large-scale skilling programs are primarily driven by government grants, industry-led initiatives, and concessional finance from multilateral development banks (MDBs) to offset high upfront costs (see Figure 13).

Industry-led initiatives and training academies could provide the initial momentum toward an EV-ready workforce through corporate social responsibility (CSR) initiatives, training academies, and strong collaboration with academia through Centers of Excellence. Blended financing models, where government

funds combine with MDB loans, could play a vital role in mobilizing the required capital to revamp the skilling infrastructure. Figure 14 summarizes the key financing avenues and pathways adopted globally for upgrading the skilling infrastructure and ecosystem.

Figure 13. Examples of skilling programs across the world

European Battery Alliance (EBA) / EIT InnoEnergy – Battery Academy:

- Supports Europe's battery value chain through coordinated industrial, R&D, and workforce initiatives, funded by a EUR 10 million (USD 9.2 million) European Commission grant and industry co-investment.
- Target: 800,000 workers to be upskilled in battery value chain

Michigan EV jobs academy

- State-led workforce initiative funded through USD 5 million federal grant, complemented by OEM and industry co-financing. It partners with employers, community colleges, and unions to train workers for EV and battery manufacturing roles, supporting gigafactories and electrified automotive supply chains across Michigan.
- USD 5,000 ~USD 7,500 grants for EV technician programs
- Target to train 2000 workers by 2026

Pradhan Mantri Skilling and Employability Transformation through Upgraded Industrial Training Institutes Program (India)

- $846 million loan from ADB to help build a skilled workforce for manufacturing and emerging tech sectors
- ADB: USD 846 million, Government fund: USD 308 million, State governments: USD 1.3 billion, Private sector: USD 670 million
- Upgrade 650 ITIs across 12 states and turn 5 National Skill Training Institutes into advance centers
- Period: 2025-2030

Source: *EIT InnoEnergy 2022; Schoenherr 2024; ADB 2025*

Figure 14. Global skill development funding Initiatives

GOVERNMENT-LED GRANTS & FISCAL SUPPORT

Direct federal grants

- EU: Project DRIVES (EUR 4 Mn)
- EU: European Battery Alliance Academy (EUR 10 mn)
- USA: Michigan EV jobs academy (USD 5 mn)

Tax credits/Subsidies

- USA: Inflation Reduction Act
- India: EV policies

INDUSTRY LED FUNDING

Corporate internal budgets/CSR budget

- OEMs run internal training centers for employees
- Several CSR initiatives cover skilling of workforce in automotive industry, especially service sector.

University endowments/Academia collaboration

- CoE with national and state universities
- Curriculum development

DEVELOPMENT LOANS & BLENDED FINANCE

- Co-finance by government fund and MDB loans
- India-ADB: USD 846 Mn under Pradhan Mantri to upgrade 650 ITIs/5 NSTIs

Source: *CPI analysis*

A concerted effort from government, industry, and academia is crucial to bridge skill gaps by jointly designing accountable and sustainable skilling pathways that align curricula with emerging EV technologies. Strategic skilling initiatives would not only mitigate job displacement but also unlock new employment opportunities, ensuring India builds a competitive, future-ready mobility workforce.

5. SKILLING INVESTMENT STRATEGY: KEY RECOMMENDATIONS

India's EV transition is more than a technological shift—it is a systemic transformation of the automotive value chain. To capitalize on this opportunity, the government can invest strategically in workforce development. In doing so, the government can adopt a three-pronged strategy: **mobilizing diverse financing sources for skilling**, **developing new EV-focused courses tailored to emerging EV domains and job roles**, and **implementing supportive policies that stimulate workforce demand across the EV value chain**.

Figure 15. Recommendations to strengthen EV skilling ecosystem in India

Mobilizing diverse financing sources for skilling

- Governments can leverage public-private partnership models, wherein industry partners can facilitate and fund infrastructure upgradation in public institutions, such as ITIs and state universities.
- Industry–academia collaborations could co-fund sector-relevant labs and training centers to increase access to training in advance technologies for diverse workforce segments.
- OEMs and ACMs could be incentivised and nudged to allocate dedicated share of CSR budget towards EV skilling and capacity building activities.

Enhance focus on specialized courses and targeted delivery

- Skilling agencies and academic institutions could curate and deliver specialized and detailed courses on battery cell engineering, advanced BMS, power electronics, embedded systems, high-voltage safety and cybersecurity.
- Focused skilling interventions on different EV domains could be curated and delivered through MSME cluster, that constitute a large share of the automotive workforce.
- Aligning curricula with industry needs and standardizing certification can ensure a steady pipeline of skilled engineers and technicians for India's growing EV ecosystem.

Implementing supportive policies that stimulate workforce demand and innovation

- Global evidence shows that countries investing early in battery manufacturing experience the strongest EV-driven workforce growth. To replicate this, existing PLI Advanced Chemistry Cell scheme could be amended to boost investment in the sector by increasing participation from emerging startups through targeted incentives.
- Existing EV schemes could be augmented with incentives or mandates to set up local R&D centers and training centers to boost innovation and aid training of workforce.
- Aligning skilling intiatives across sectoral missions, state industrial and EV policies could improve coherence and effectiveness of skilling investments and programs.

Together, these interventions can strengthen the talent pipeline, facilitate smoother sectoral transitions and ensure that workers are prepared for rapidly evolving roles across the value chain. By proactively equipping institutions, industries, and individuals, India can build a resilient skilling ecosystem that keeps pace with technological change.

5.1 FUTURE WORK

This study assesses the employment impact of India's EV transition and the skilling investments needed to sustain a future-ready workforce. CPI's next phase of work will move beyond the EV value chain to deliver a comprehensive analysis of how the broader mobility transition will reshape India's economy. Future work will include a detailed economic impact assessment, quantifying long-term effects on gross value addition and sectoral performance across the automotive, oil and gas, and power sectors. It will also examine implications such as reduced crude-oil imports, shifts in government revenues, evolving component trade patterns, and environmental outcomes from India's growing EV ecosystem.

6. ANNEXURE: METHODOLOGY & ASSUMPTIONS

This section details the methodology used to estimate the impact of the EV transition on the workforce, focusing on direct and indirect jobs created in the EV manufacturing ecosystem and associated value-chain actors, as outlined in Sections 3.2 and 3.3. Table A1 provides a summary of the vehicle sales forecast across different segments in years FY2026, FY2030, FY2035, FY2040 and FY2047. Table A2 presents the methodology, assumptions, and sources considered.

Table A1. Vehicle sales forecast under different vehicle segments till FY2047 (in millions)

Year	FY2026	FY2030	FY2035	FY2040	FY2047
2W	23.58	26.81	31.79	36.51	40.11
3W	0.75	0.81	0.96	1.16	1.41
4W	4.62	5.40	6.43	7.66	9.27
Buses	0.12	0.14	0.18	0.26	0.35
LCV	0.58	0.95	1.11	1.26	1.59
MHCV	0.37	0.48	0.51	0.62	0.75
Tractor	0.95	0.98	1.01	1.04	1.06
Total sales	**30.97**	**35.57**	**41.99**	**48.50**	**54.54**

Source: *CPI analysis*

Table A2. Assumptions, detailed methodology, and sources for estimation of workforce demand

Description	Methodology / Assumptions	Sources
Projection of vehicle sales until FY2047	• Historical vehicle sales (FY2003–25) were used to estimate vehicle stock via survival functions. • Historical vehicle ownership (excluding tractors) was derived from historical population and stock data. • Future ownership (FY2026–47) was projected using the Gompertz function, factoring saturation levels and RBI GDP per capita forecasts. • Vehicle stock was calculated from projected ownership and population, and sales (FY2026–47) were back-calculated using survival functions.	Arora et al. 2011; CEEW 2022; Guttikunda 2024; United Nation 2024; RTO 2025; Vaahan 2025

Description	Methodology / Assumptions	Sources
	• Tractor sales were estimated using historical data and growth rates from a computable general equilibrium model, considering food demand, cropping intensity, and available agricultural land.	
Rationale for EV penetration under 100% EV Scenario	Based on EV share targets and the current annual growth rate of EV penetration across vehicle segments in China and Vietnam, 100% electrification was set: • 2Ws and 3Ws by 2040 • 4W and LCVs (having battery sizes in a similar range) by 2045 • larger category vehicles, buses, trucks, and tractors by 2047 **Other assumptions**: • Five-year targets were set to maximize EV share growth between 2030 and 2040, followed by a gradual plateau through 2047. • Buses, trucks, and tractors will electrify at a slower pace compared to passenger vehicles and e-LCVs. • Similar battery capacities and charging requirements will enable e-LCVs and e-cars to follow comparable adoption trajectories. • Low-emission zone policies in Indian cities will accelerate the adoption of e-cars, e-LCVs, and e-M/HCVs. • SRTUs will drive public bus electrification through 2035. • Institutional and private intercity buses will lead e-bus adoption beyond 2035.	ICCT 2022; World Bank 2024; Government of Vietnam 2025 Apr 22; Hove et al. 2025
Projection of direct jobs for OEMs	• Current direct employment in EV OEMs is derived from OEM payrolls. • Direct employee headcount is projected using average EVs produced per employee annually in FY2025: e-2Ws – 33; e-3Ws – 18; e-4Ws – 7; e-bus – 1; e-trucks & e-tractors – 3 • Rise of automation in repetitive, rule-based, and semi-cognitive functions—including assembly operations, parts movement, and quality control will reduce 26% of jobs in FY2030 and 45% in FY2047. • Localization of components in EVs is assumed to increase from 40-50% in FY2025 to 70% in FY2030 and 100% by FY2047. • A localization multiplier of 1.67 for FY2030 and 2 for FY2047 is applied to the estimated direct employee headcount.	Vaahan 2025, Primary Survey with OEMs
Projection of indirect jobs for OEMs	• The indirect workforce is estimated using direct-to-indirect employment ratios for each vehicle segment. • e-2W and e-3W create more indirect employment per manufacturing job due to unauthorized and fragmented micro-vendors, outsourced battery pack assembly. • Heavy commercial vehicles show lower indirect ratios due to consolidated suppliers and higher direct labor. **Direct-to-indirect employment ratios for FY2030** • e-2Ws – 1:6; e-3Ws – 1:8; e-4Ws – 1:4; e-buses/trucks/tractors – 1:3 **Direct-to-indirect employment ratios for FY2047** • e-2Ws – 1:5; e-3Ws – 1:6; e-4Ws – 1:4; e-buses/trucks/tractors – 1:3	Primary survey with OEMs, CPI Analysis

Description	Methodology / Assumptions	Sources
Projection of jobs for charging infrastructure and battery recycling	**Charging infrastructure** • The existing EVs per charger ratio in India and CII recommended 40 EVs per charger is used for estimating public chargers by FY2047 for e-2Ws/3Ws/4Ws stock. • For e-trucks, e-buses, and e-tractors, China's existing ratio of one charger per 10 EVs is multiplied by the projected stock. • Job multipliers of 1.2 (FY2030) and 2 (FY2047), is considered to estimate total jobs in public charging infrastructure based on stakeholder insights, localization of public charger manufacturing and reduction in jobs due to automation. • Ratio of ¼ is considered for direct jobs in total public charging jobs from 2025 to 2040. Considering supply chain consolidation for public charging infrastructure related jobs and increased localization of charger and components, ratio of ½ is considered for direct jobs in total public charging jobs from 2041 to 2047. **Battery recycling** • For battery recycling, a conservative direct jobs multiplier of 0.015 is used, i.e., the number of jobs created per kWh of battery recycled based on recent studies in the US.	CII 2023; IEA 2024b; ICCT 2025b; Primary survey, CPI analysis

Table A3. Major job roles for EV OEMs

	Function	Role
1	Corporate	Assistant Company Secretary
2	Corporate	Chief Medical Officer
3	Corporate	Chief of Staff – CEO Office
4	Corporate	Compensation & Benefits Specialist
5	Corporate	Contract Quality Checker
6	Corporate	Costing/ Accounts officer - Finance
7	Corporate	Enterprise Resource Planning Product Owner
8	Corporate	Financial Controller
9	Corporate	GST Specialist – Indirect Tax
10	Corporate	Head – Corporate Strategy
11	Corporate	Head – IT & Infrastructure
12	Corporate	Head – People & Culture
13	Corporate	Head – Security
14	Corporate	HR Business Partner – Engineering

	Function	Role
15	Corporate	Industrial Relations Manager
16	Corporate	Learning & Development Lead
17	Corporate	Legal & Compliance Counsel
18	Corporate	MIS & Audit Coordinator – Finance
19	Corporate	Procurement Finance Manager
20	Corporate	Project Management Officer – EV Business
21	Corporate	Sustainability Manager
22	Corporate	Talent Acquisition Manager
23	Corporate	Treasury & Investor Relations Lead
24	Corporate	Workplace & Admin Lead
25	Operations	Assembly Line In Charge
26	Operations	Automation Maintenance Technician
27	Operations	Battery Cell & Pack Assembler
28	Operations	Battery Pack Disassembly Technician
29	Operations	Battery Process Engineer
30	Operations	Battery Recycling Operator
31	Operations	Battery Testing Technician
32	Operations	Chassis & Trim Technician
33	Operations	Cleaning Operator
34	Operations	Connected Software Technician
35	Operations	Drivetrain Manager
36	Operations	Effluent Treatment Plant Operator
37	Operations	Electric Drivetrain technician
38	Operations	Electrical Maintenance Technician
39	Operations	Electrical Panel Technician
40	Operations	End of Line Test Operator
41	Operations	Field Service Technician
42	Operations	Forklift / Material Handling Equipment Operator

	Function	Role
43	Operations	General Assembly Operator
44	Operations	Glass Fitment Technician
45	Operations	Head – Manufacturing
46	Operations	Head – Quality
47	Operations	Head – Safety
48	Operations	Head Production Planning
49	Operations	Homologation Lead
50	Operations	Laser Welding Technician
51	Operations	Lead – Production Line Engineering
52	Operations	Lean Manufacturing Specialist
53	Operations	Line Automation Specialist
54	Operations	Line Material Handler
55	Operations	Maintenance Planning Lead
56	Operations	Manufacturing Digitalization Analyst
57	Operations	Mechanical Maintenance Technician
58	Operations	Overhead Crane Operator
59	Operations	Paint Shop Lead
60	Operations	Paint Shop Operator
61	Operations	Plant Head – EV Facility
62	Operations	Plant Industrial Engineer
63	Operations	PMS Motor Build Technician
64	Operations	Power Electronics Assembler
65	Operations	Printed Circuit Board Assembly Technician
66	Operations	Quality Control Supervisor
67	Operations	Robotic Cell Operator
68	Operations	Safety officer
69	Operations	Sheet Metal Fabricator
70	Operations	Shift Production Manager

	Function	Role
71	Operations	Stamping Press Operator
72	Operations	Supplier Quality Engineer
73	Operations	Test Track Assistant
74	Operations	Tool room technician
75	Operations	Tool Setter
76	Operations	Tooling & Die Lead
77	Operations	Vehicle Production Planner
78	Operations	Vehicle Road Test Technician
79	Operations	Vehicle Wiring Technician
80	Operations	Welding & Fabrication Technician
81	Operations	Welding Inspector
82	Operations	Wheel Alignment Technician
83	R&D	3D Printing Technician – Tooling
84	R&D	Battery cell expert
85	R&D	Battery Pack Design Engineer
86	R&D	Battery Sorting & Grading Operator
87	R&D	Battery Testing & Safety Engineer
88	R&D	Cybersecurity Lead – Connected EVs
89	R&D	Data Scientist – Vehicle Performance
90	R&D	Embedded Systems Developer
91	R&D	E-Motor Simulation Engineer
92	R&D	EV Product Experience Researcher
93	R&D	Head R&D
94	R&D	HIL/SIL Testing Engineer
95	R&D	In-Vehicle Software Integration Engineer
96	R&D	New Product Development Lead
97	R&D	OTA Software Testing Engineer
98	R&D	Paint Engineer

	Function	Role
99	R&D	Power Electronics Engineer
100	R&D	Product Validation Lead
101	R&D	Simulation Analyst
102	R&D	Software Release Manager
103	R&D	Telematics Backend Engineer
104	R&D	User Insights Specialist – EV Experience
105	R&D	Vehicle Architecture Engineer
106	R&D	Vehicle Dynamics Engineer
107	R&D	Vehicle Integration Engineer
108	Sales & aftersales	Channel Strategy Lead
109	Sales & aftersales	Charging Bay Supervisor
110	Sales & aftersales	Charging Equipment Installer
111	Sales & aftersales	Customer Complaint Manager
112	Sales & aftersales	Customer Relationship Manager
113	Sales & aftersales	Digital Tools Manager – Service
114	Sales & aftersales	EV Charging Infrastructure Planner
115	Sales & aftersales	EV Product Specialist
116	Sales & aftersales	Field Repair Data Analyst
117	Sales & aftersales	Field Service Engineer
118	Sales & aftersales	Fleet Delivery Executive
119	Sales & aftersales	Fleet Handover Technician
120	Sales & aftersales	Fleet Sales Manager
121	Sales & aftersales	Head – Sales
122	Sales & aftersales	Inside Sales Executive
123	Sales & aftersales	Pricing & Incentives Analyst
124	Sales & aftersales	Regional Sales Manager
125	Sales & aftersales	Regional Service Manager
126	Sales & aftersales	Sales Planning Manager

	Function	Role
127	Sales & aftersales	Sales Trainer
128	Sales & aftersales	Service Quality & Diagnostics Lead
129	Sales & aftersales	Technical Support Specialist
130	Sales & aftersales	Telematics Device Installer
131	Sales & aftersales	Warranty & Claims Manager
132	Supply Chain	Battery Sourcing Manager
133	Supply Chain	Component Localization Manager
134	Supply Chain	Cost Engineering Analyst
135	Supply Chain	Electronics Procurement Lead
136	Supply Chain	Logistics- Yard technician
137	Supply Chain	Material Handler Operator
138	Supply Chain	Procurement Program Manager
139	Supply Chain	Raw Material Buyer
140	Supply Chain	Sourcing Compliance Officer
141	Supply Chain	Spare Parts Planning Manager
142	Supply Chain	Strategic Sourcing Analyst
143	Supply Chain	Supplier Development Engineer
144	Supply Chain	Supply Chain Coordinator
145	Supply Chain	Supply Chain Lead
146	Supply Chain	Warehouse Loader / Unloader
147	Sales & aftersales	Pre-Delivery Inspection Technician

Source: *CPI Analysis*

Table A4. Key skill gaps identified for different EV value chain segments

Value-chain segment	NSQF Level(s)	Key skill gaps identified
EV design, manufacturing	L4-L6	• HV safety and insulation testing • Power-electronics interface • Digital documentation • Robotics and automation • Mechatronics and electrical integration • System integration across electrical–mechanical interfaces • Functional safety (ISO 26262)
EV powertrain	L4–L6	• Robotic assembly, torque sensing, and precision automation • Functional safety (ISO 26262) • Thermal management • Light-weight materials design • Composite / Fiber-reinforced materials design/ development • DVP&R, validation standards, and statistical process control
Battery systems	L4–L7	• Cell chemistry • Cell packaging • Thermal-runaway modeling • Pack cooling design • Fire-safety testing • Battery modeling software • High-voltage safety
Charging infrastructure	L4–L7	• Charging protocol (OCPP 2.0.1, IEC 63110, IEC 61851) • Vehicle-to-grid technology • GIS tools • Demand forecasting • Grid-load management
Aftersales and maintenance	L4–L7	• Battery SOH monitoring • Predictive maintenance • High-voltage safety and diagnostics • Software tools
Battery recycling and secondary life usage	L5-L7	• Material recovery technology • EPR compliance knowledge • High-voltage safety • Traceability linkage and software
Supply chain, logistics & manufacturing operations	L5–L7	• Vendor qualification systems • Green procurement • Blockchain-based traceability • ERP and blockchain-based traceability

Value-chain segment	NSQF Level(s)	Key skill gaps identified
Cross-cutting digital, data & software roles	L5–L7	• Software integration • Data analytics • Cyber-risk modeling

Source: *CPI analysis*

Table A5. EV skill courses available in India

Short-term Programs	Long-term Programs
Technician	
• Hybrid Electric Vehicle (Hev) Technician • EV Service Technician Programme • Certified Electric Vehicle Technician Training Program (CEVT) • Hybrid & Electric Vehicle Repair and Troubleshooting • Battery Electric Vehicle (Bev) Technician • E-mobility Communication architecture and diagnosis	
Charging Infrastructure	
• EV Charging Infrastructure & O&M • Electric Vehicle Charging Systems and Energy Management Strategies • Professional Certification Program in Charging Technologies and Hydrogen Fuel Cell Systems	
Fundamentals	

Short-term Programs	Long-term Programs
• Battery Technology Certification • Certificate Course in Electric Vehicle Technology • Electric Vehicles Advanced Certification Course • Basic of Electrical Engineering for Electric Vehicle Certification Course • Fundamentals of Electric Vehicle Technology and Industry Transition • Electric Vehicle Essentials: Motors, electrification and charging systems • Electric Vehicle Essentials: Ecosystem, Industry Transition and Technology • Essentials of Battery and Motor Technologies in Electric Vehicles • Comprehensive Overview of EV Industry: Safety, Supply Chain, and Manufacturing Processes • Electric Vehicle Course (Essentials) + Project-based 1-month Internship Certification Course • Specialization Course in EV – The Future Ready Program for Professionals (Certified by ASDC, Govt. of India)	• Professional Certificate in EV Engineering • AICTE-NEAT Approved and Certified Master Certification Program in Electric Vehicle Technology • PGC in Electric Vehicle • Fundamentals of EV & Vehicle Architecture
Battery/BMS	
• Electric Vehicle Battery Pack Modelling Course (including Project-based 1-month Internship program) • BMS – Battery Management System Certification Course (including Project-based 1-month Internship program) Certification Course	
• Professional Certification Program in Battery Technology and Powertrain Engineering	
Powertrain	
• Electric Vehicle Motor Controller - Certification • Electric Vehicle Powertrain Engineering (Advanced) (Optional Project-based 1-month Internship program) Certification Course • Specialization Course in EV – The Future Ready Program for Professionals (Certified by ASDC, Govt. of India) • Electric Vehicle Powertrain Engineering (Advanced) (Optional Project-based 1-month Internship program) Certification Course • Certificate course in EV Powertrain architecture and energy storage systems • Professional Certification Program in Motor Drive Systems & Control Systems • Professional Master Certification Program in EV Powertrain Architecture and Energy Storage System	• PGP in Powertrain
Design/Engineering courses	

Short-term Programs	Long-term Programs
• Certificate course in Electric Vehicle Research & Development(R&D) • Certificate course in Electric vehicle System integration • Certification Program in Electric Vehicle Modeling and design with SOLIDWORKS • Design of EV Using MATLAB (including Project-based 1-month Internship program) Certification Course • Design of Hybrid EV using MATLAB (Project Based) Certification Course • Three Week Internship / Training Program on Electric Vehicle Design & Development • EV Architecture Modeling using MATLAB Simulink • Advanced EV Engineering: Numerical Analysis, Hybrid Manufacturing, Batteries and Motor Systems • EV design, simulation, and component selection • Professional Certification Program in Electric Vehicle Design and Simulation Engineering • EV Homologation and Testing • Professional Certification Program in EV Engineering • Professional Certification Program in EV Automotive Design and Simulation • Certificate course in Embedded Systems for Electric Vehicle Engineering • Certificate course in Data Science and Engineering Analytics for EVs • PYTHON Programming Language (For Mechanical & Electrical Engineers) Certification	• Postgraduate Program in Electric Vehicle Design • IIT Delhi EV Engineering (CEP) • Electric Vehicle Nanodegree • Embedded Systems for EVs • PG Certification in Hybrid Electric Vehicle Design and Analysis • Advanced Nanodegree Program in EV Engineering, Design, Simulations, and Analysis for Electrical & Electronics Engineers • Advanced Embedded Systems Design and Development • Advanced Nanodegree Program in EV Engineering, Automotive Design, Development, and Dynamic Analysis for Mechanical Engineers • Electric Vehicle & Embedded Systems Nanodegree Certification Course (With Placement Assistance) • PG Certification in Data Science & AI/ML • PG Program in Electric Vehicle & Embedded Systems Advanced Engineering
Others	
• Business Opportunities in EV • Electric Vehicle Business Certification Course • Safety Training for Electric Vehicles: Train-the-Trainer Course	• Advanced 6-Month Nanodegree Program in EV Business Strategy & Entrepreneurship in Automotive Domains

Source: *CPI analysis*

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