

Skilling the Workforce for EV Transition

A Briefing Paper



December 2024



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TABLE OF ABBREVIATIONS

ACM	Auto Component Manufacturers
AI	Artificial Intelligence
ASDC	Automotive Skills Development Council
BAU	Business As Usual
CAN	Controller Area Network
CCS	Combined Charging System
CHAdemo	Charge For Moving
CII	Confederation of Indian Industry
CNC	Computer Numerical Control
CSR	Corporate Social Responsibility
DST	Dual System of Training
EVs	Electric Vehicles
E2Ws	Electric Two-Wheelers
E3Ws	Electric Three-Wheelers
GoI	Government of India
GPS	Global Positioning System
ICE	Internal Combustion Engine
IoT	Internet of Things
ITIs	Industrial Training Institutes
NAPS	National Apprenticeship Promotion Scheme
NEVI	National Electric Vehicle Infrastructure Formula Program
NSDC	National Skills Development Council
NSQF	National Skills Qualifications Framework
OCPI	Open Charge Point Interface
OCPP	Open Charge Point Protocol
OEM	Original Equipment Manufacturers
PGO	Professional Garage Owners
PMKVY	Pradhan Mantri Kaushal Vikas Yojna
PSSC	Power Skill Sector Council
RE	Renewable Energy
RM	Raw Material
R&D	Research and Development
SC/ST	Scheduled Caste/ Scheduled Tribe
SIAM	Society of Indian Automobile Manufacturers
SSCs	Sector Skill Councils
UK	United Kingdom
USA	United States of America

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EXECUTIVE SUMMARY

India's ambitious target of 30% electric vehicle (EV) sales by 2030 presents a significant workforce transformation challenge that demands immediate attention. The automotive sector, currently employing 32 million people and projected to reach 46 million by 2026, stands at a critical juncture where traditional internal combustion engine (ICE) skills must evolve to meet the demands of an electrified future. This report delves into the evolving skilling requirements at different stages of EV ecosystem and the strategies needed to address the workforce challenges arising from this ICE to EV transition.

In order to facilitate a fundamental restructuring of the automotive workforce landscape, it must be considered that 66 existing job roles face obsolescence and 93 new roles are emerging. Also, among the overall job roles, 43% technical competencies between ICE and EV manufacturing are different. The current skilling ecosystem, while making progress, faces several challenges - shortage of skilled workforce, high service provider dropout, infrastructure deficiencies, and quality issues in training programs. The situation mirrors international experiences, where skills shortages have already impacted EV maintenance costs and charging infrastructure reliability in developed markets.

While industry projections indicate a requirement of 200,000 skilled workers by 2030, the current training capacity stands at merely 15,000 workers annually. The current skilling infrastructure, despite its extensive network of Industrial Training Institutes (ITIs) and Pradhan Mantri Kaushal Vikas Yojana (PMKVY) centers, has immense potential to evolve and meet the sector's evolving needs. Towards this, the report recommends some key strategies including -

- Incentivizing industry-led reskilling programs by government,
- Adopting certification-based training models and moving beyond apprenticeships,
- Establishing state-level multi-stakeholder skills taskforce,
- Leveraging philanthropic support for skilling & training initiatives, and
- Fostering varied forms of industry collaborations viz. industry-industry, industry-academia, etc.



INTRODUCTION

EV sales by 2030¹. In 2023-24, the EV registration accounted for 7%² in the total vehicles registered with 1.7 million EVs. This tectonic shift from ICE vehicles to EVs, driven by environmental concerns and technological advancements, is reshaping the entire automotive value chain, including manufacturing, sales, and service.

This transition is reshaping the entire automotive value chain and necessitates urgent focus on workforce skilling and reskilling. International examples underscore this urgency: the UK³ and Australia⁴ face high EV repair costs due to skilled worker shortages, leading to premature vehicle write-offs, while U.S. non-Tesla charging stations operate at 72% uptime⁵ versus the required 97% due to maintenance personnel shortages⁶. All this highlights the importance of gearing up for not just the manufacturing, but also the repair and maintenance needs of an EV ecosystem.

The Government of India has recognized this imperative, incorporating EV-focused green jobs in its national roadmap⁷, as highlighted in the Prime Minister's Post Union-Budget Conference speech. The 2024-25 budget⁸ prioritizes skilling and employment, while the upcoming 4th National Conference of Chief Secretaries⁹ includes 'employment, entrepreneurship and skilling' on its agenda, due in November 2024.

The automotive sector is the third biggest employer in the manufacturing sector, responsible for 9.58%¹⁰ of the employment. It provided direct and indirect employment to 32 million¹¹ people in 2018, projected to reach to 46 million by 2026¹². A detailed break up of these projections are captured below in the Figure 1 from ASDC's Human Resource and Skill Requirements in the Automotive Sector report.¹³

Given this vast employment footprint, this paper analyzes emerging skill gaps and requirements in the ICE-to-EV transition, examines the current skilling ecosystem, and incorporates insights from industry leaders like Hero Electric and ReadyAssist, who are undertaking flagship training programs for service technicians. Through this comprehensive approach, the paper seeks to contribute to the development of effective strategies for building a future-ready automotive workforce in India.

#	Sub Sector	2018	2019	2020	2021	2022	2023	2024	2025	2026
1	Manufacturing & R&D	4.14	3.98	4.30	4.64	4.89	5.16	5.45	5.75	6.07
1.1	OEM	0.33	0.30	0.31	0.32	0.33	0.34	0.37	0.40	0.42
1.2	Auto comp	1.75	1.68	1.81	1.95	2.05	2.15	2.25	2.36	2.48
1.3	RM	2.06	2.00	2.18	2.38	2.52	2.67	2.83	2.99	3.17
2	Dealership sales	3.00	2.71	2.78	2.89	3.00	3.17	3.43	3.64	3.86
3	Vehicle service total	5.05	5.37	5.64	5.84	6.02	6.23	6.50	6.78	7.09
3.1	Authorised service	2.00	2.12	2.23	2.31	2.38	2.47	2.57	2.68	2.80
3.2	Roadside Mechanics	3.05	3.25	3.41	3.53	3.63	3.76	3.93	4.10	4.29
4	Road Transport	17.22	17.22	19.93	20.96	21.88	23.08	23.08	26.26	28.06
Total		29.41	30.74	32.65	32.65	35.80	37.64	40.01	42.44	45.08

Figure 1: Projections of Employment in Automotive Sector
(Source: ASDC)

02 JOB CREATION & SKILL DEVELOPMENT IN AUTOMOTIVE SECTOR: THE URGENT NEED

Unlike the conventional automotive sector jobs, the switch to EV ecosystem requires a comprehensive skill set encompassing knowledge of electronic systems and digital technologies (mechatronics, robotics, data analytics and AI, etc), EV assembly lines, electric/hybrid vehicle repair, battery chemistries, and many more. To effectively address this shift, it's essential to evaluate both the jobs being displaced and the opportunities created, while also exploring the scope and potential of new, high-quality green jobs.

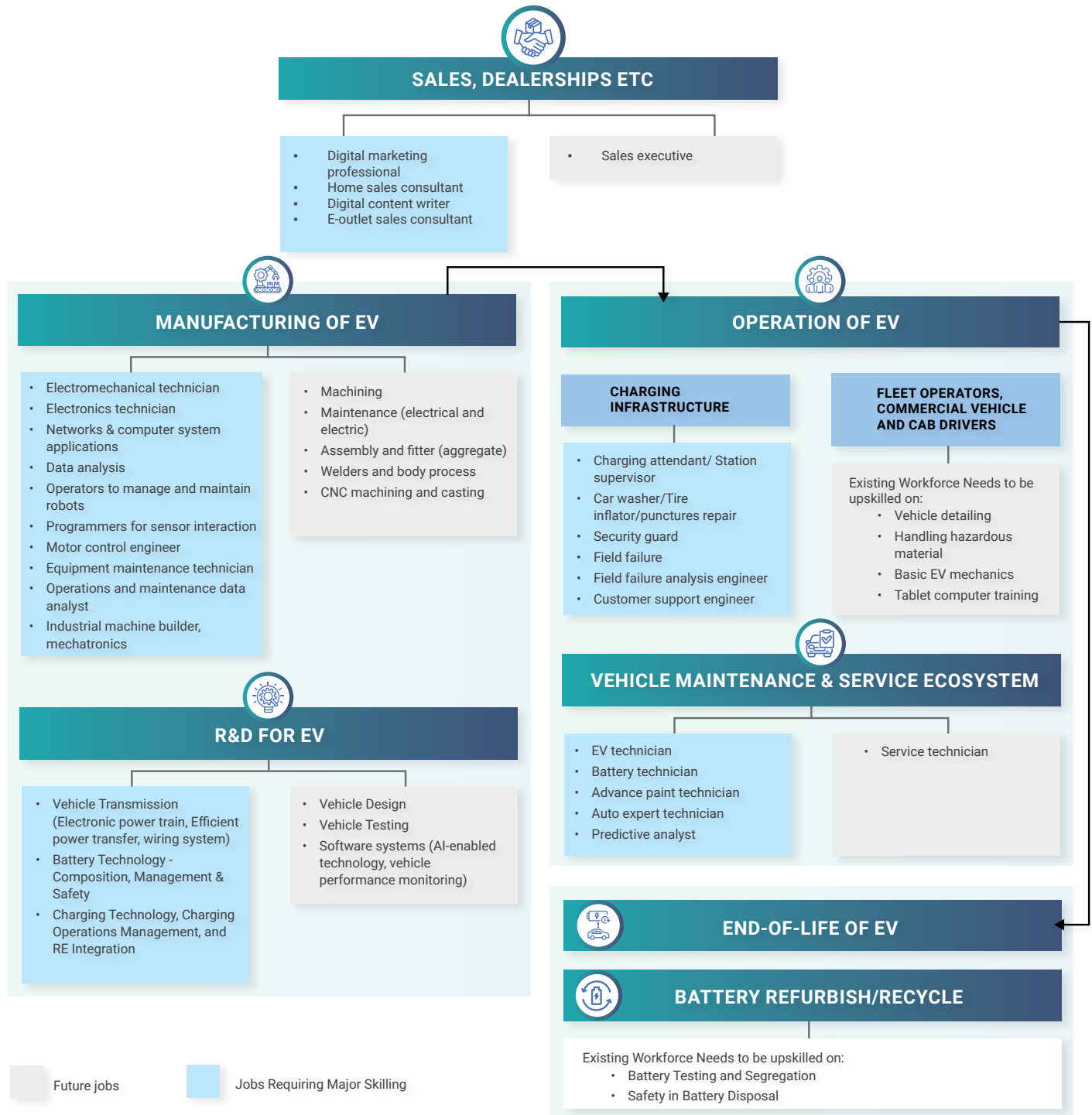


Figure 2: Job Roles Across the EV Value Chain
(Source: Vasudha Foundation Analysis, OMI Foundation Analysis and EY Analysis)

The scale of transformation is significant, with 45-84%¹⁴ of ICE vehicle parts, particularly powertrain components, facing obsolescence. While 66 existing job roles will become obsolete, 93 new roles¹⁵ will emerge. Notably, 43%¹⁶ of technical competencies between ICE and EV manufacturing do not overlap, necessitating extensive workforce reskilling or new hiring.

The shift from ICE vehicles to EVs requires a distinct set of skills, reflecting the differences in technology and operational demands. The required skill set for EVs also varies based on the type of EV (such as Battery EV, Fuel Cell EV) and the category (including two-wheelers, three-wheelers, cars, or trucks).

This transition offers a wide range of opportunities across the automotive value chain. While EV manufacturing, sales, and servicing lead the way, significant potential also exists in areas like battery production, R&D for advanced battery technologies, and battery refurbishing and recycling. Additionally, opportunities abound in building and maintaining the supporting EV infrastructure, such as charging stations and home charging units. Together, these developments promise to create a substantial number of direct and indirect jobs.

A study¹⁷ has analyzed that out of about 564 job roles in the entire automotive value chain (54% of these pertaining to manufacturing), approximately 31% of the job roles are likely to be affected - 14% of the jobs to become obsolete, and 17% will require reskilling. (See Annexure on list of existing and future jobs).

Industry body SIAM has suggested that the automotive industry in India will require up to 2 lakh¹⁸ skilled workers to facilitate meeting the 30% EV sales by 2030 target laid down by the GoI. Currently, India adds 15,000 EV-ready workers annually¹⁹, but this needs to double to 30,000 per year to achieve 100% localization of EV components. Achieving the 30% target will necessitate creating 1.2 lakh new jobs in the sector.

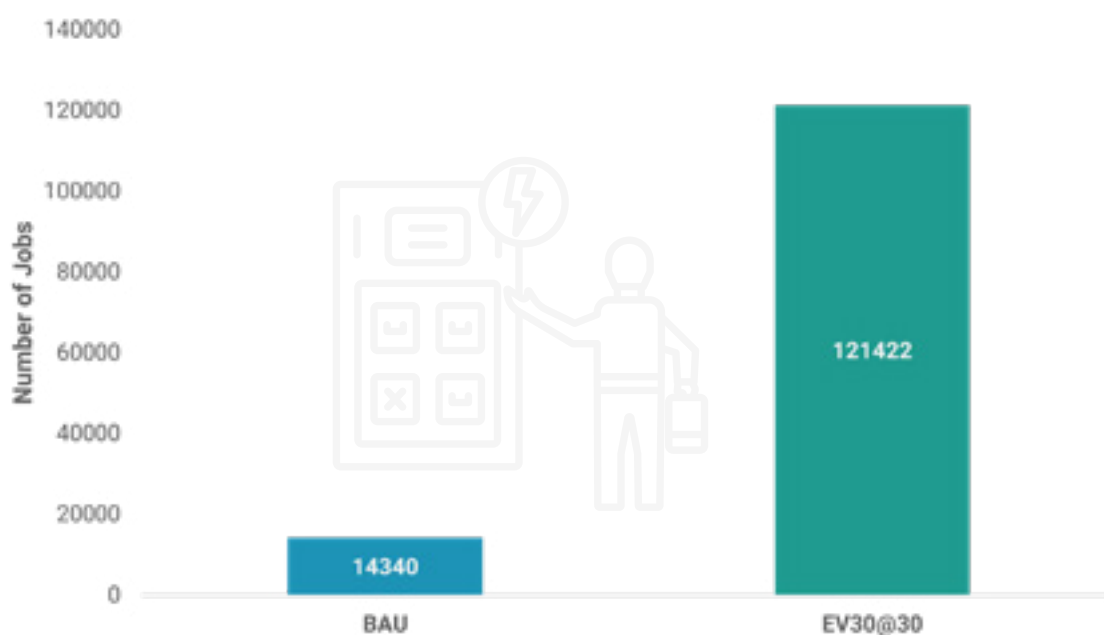


Figure 3: Jobs in EV Value Chain – BAU vs. EV30@30
(Source: OMI Foundation (2020))

03 SKILLING REQUIREMENTS

Bridging the automotive sector's skill gap requires targeted development initiatives to build a workforce equipped for emerging technological challenges. The EV sector demands diverse competencies spanning technical expertise, operational knowledge, and adaptability to evolving technologies - from battery handling and mechatronics to charging infrastructure and vehicle diagnostics. Understanding and addressing these skill requirements is crucial for ensuring both a fair workforce transition and advancing India's green growth and net-zero objectives. The diagram below maps essential knowledge areas and capabilities needed across the EV value chain.

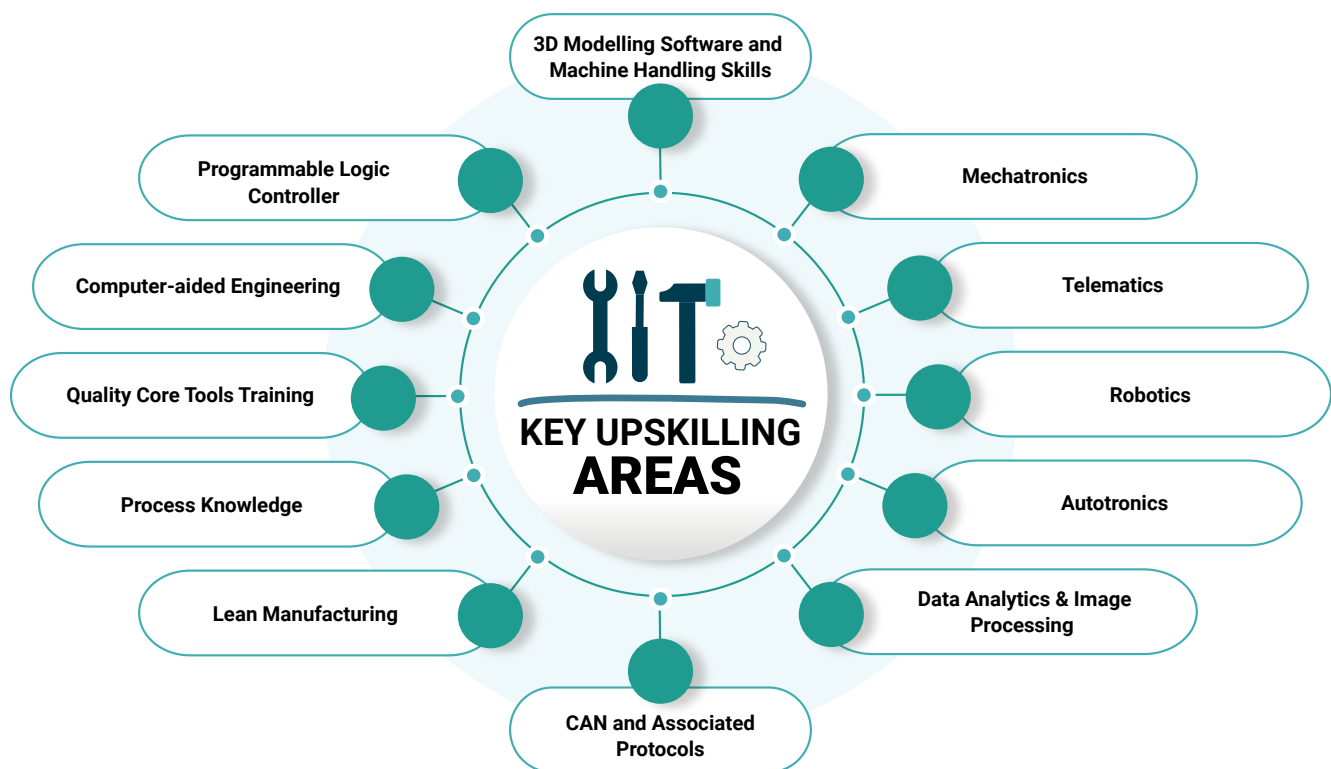


Figure 4: Key Upskilling Areas for EV Ecosystem
(Source: Vasudha Foundation Analysis)

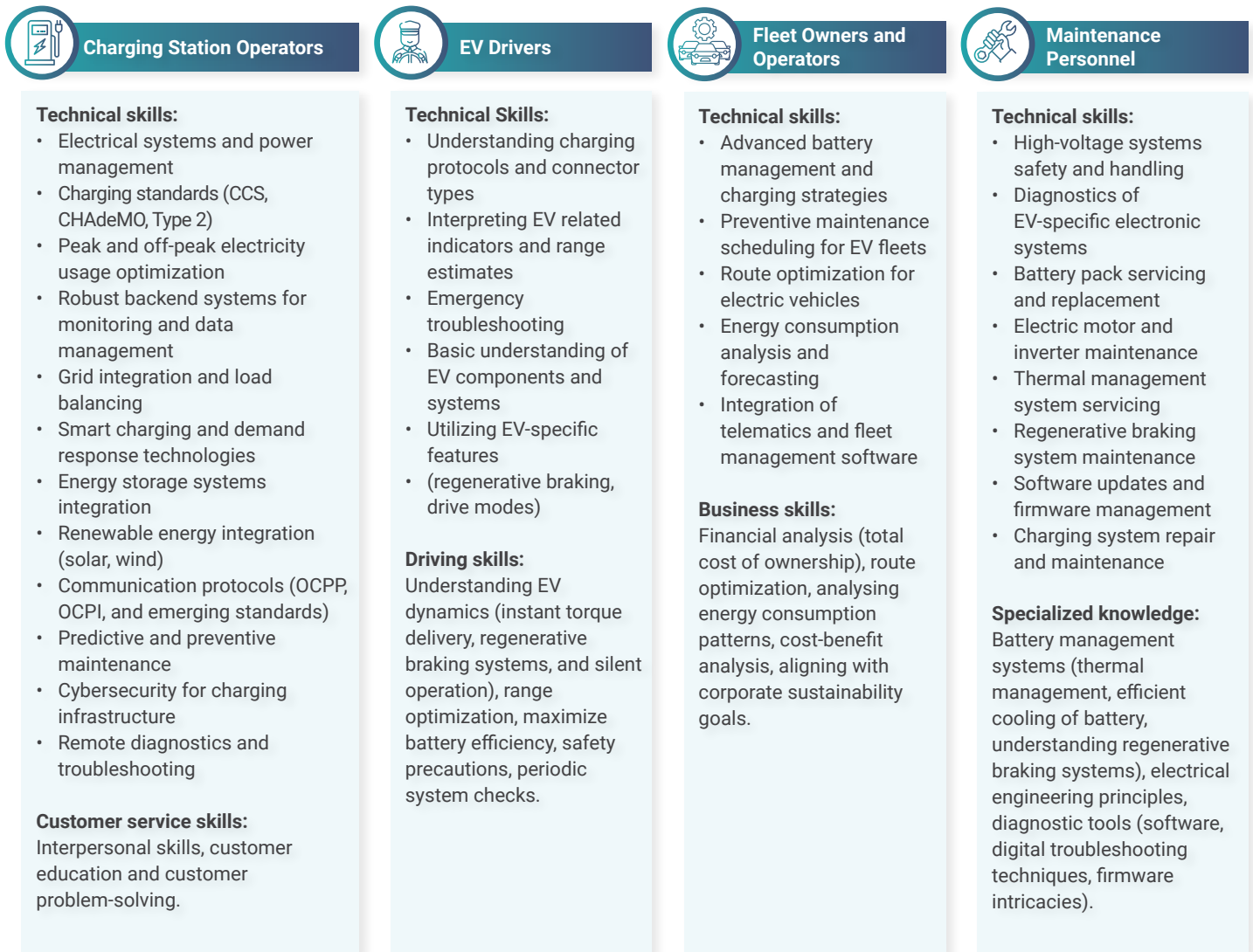
Some of these skill-sets required for EV manufacturing as well as servicing are highly advanced, which will require substantial reskilling and upskilling efforts from the workforce to meet the changing market demand for skills. The figure 5 below depicts how the demand for skills will change from ICE to EV, predominantly to skill levels above NSQF 4.²⁰

NSQF Levels	Obsolete Job roles (% of total jobs at the NSQF level)	New Job roles (% of total jobs at the NSQF level)
Level 2	10.6	2.1
Level 3	8.1	1.1
Level 3.5	1.5	5.4
Level 4	38.4	30.1
Level 4.5	12.1	7.5
Level 5	25.8	36.6
Level 5.5	8.1	2.1
Level 6	1.5	15.1
Total	100	100

*Figure 5: Required Skill Levels for Job Roles for EV Ecosystem
(Source: iForest)*



Depending upon the job role, or the stage at which any worker is involved in the EV ecosystem, the skilling requirements will be identified accordingly.



Charging Station Operators

Battery Technology

Advanced materials science, chemistry, electronics.

Renewable Energy

Grid integration, solar/wind energy, energy storage.

Manufacturing

Electric drivetrains, electric motors, regenerative braking, component assembly.

Figure 6: Skills Required across Various Roles/Stages of the EV Value Chain
(Source -Vasudha Foundation Analysis and AEEE Report)

04 SKILLING ECOSYSTEM AND INFRASTRUCTURE

‘Skilling and Vocational Education’ constitute a part of Concurrent List under Entry 25 of the Constitution, both central and state governments act towards it. However, considering the rapid pace of transition and the burgeoning demand for skilled workforce, support from industry bodies and other private players will be critical to keep up with the skilling demand. Presently, the Skilling Ecosystem in India can be broadly identified as follows with the key stakeholders.

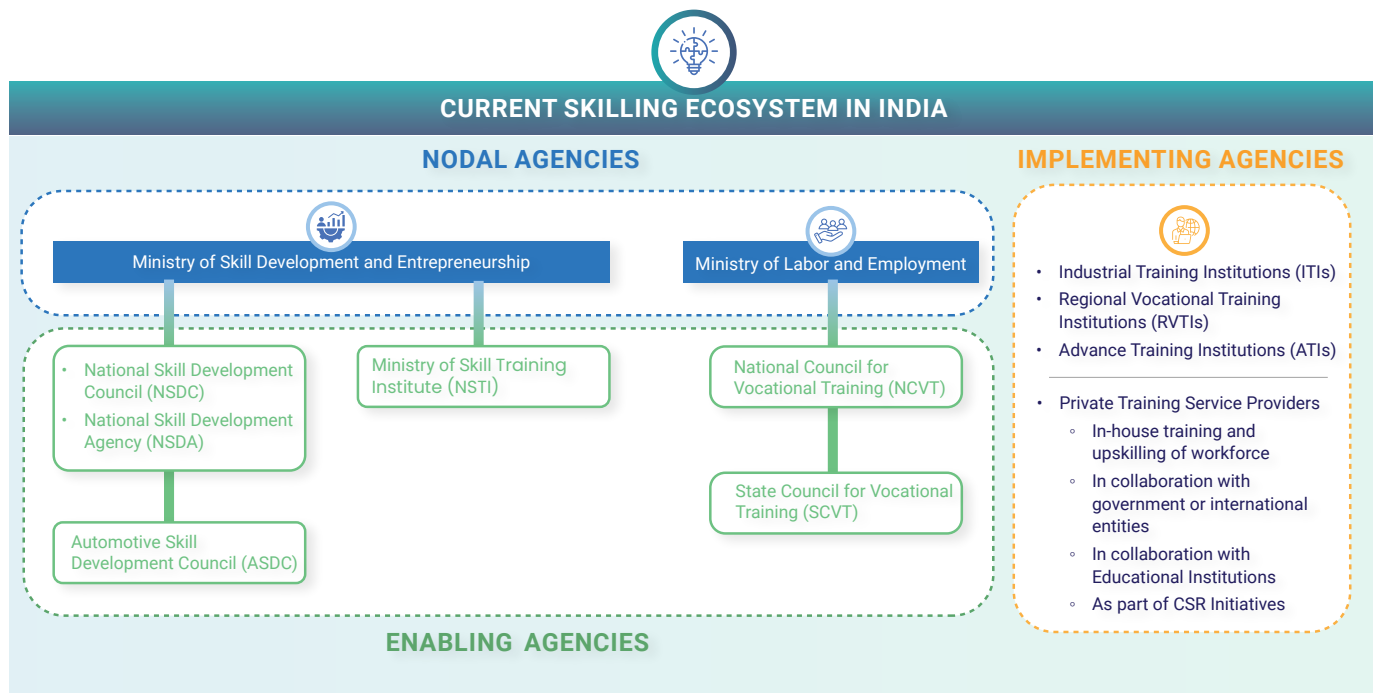


Figure 7: Skilling Ecosystem in India



Skilling for the ICE to EV transition in India is happening through a multifaceted approach²¹ involving state-led initiatives, industry partnerships, and central government programs. To meet the growing demand for EV skills, specialized training programs as well as academic partnerships have been undertaken in states like Maharashtra, Karnataka, and Tamil Nadu. Additionally, public-private collaborations are also being explored to create training modules that address both job opportunities and industry needs. Think tanks are also offering training to fleet operators to prepare them for this transition. The GoI's Skill India program has also been harnessed to address the EV skill gap and towards this, ASDC has set standardized curricula and certified trainer benchmarks to facilitate successful skilling initiatives. The collaborations between Automotive OEMs and academic institutions are also gaining traction as these are specialized training courses providing hands-on experience and knowledge in EV technology.

	Government Training		Private Training
	Long-term Training	Short-term training	
About	Provided via ITIs and Engineering Colleges	Provide under schemes such as Pradhan Mantri Kaushal Vikas Yojna (PMKVY) & National Apprenticeship Promotion Scheme (NAPS) etc	Provided by OEMs, ACMs, and private trainers
Infrastructure 	15,020 ITIs	2640 Total PMKVY Centres	Conducted via in-house training provided through their own training centres. Companies often tie up with training institutes as well. Also, Sector Skill Councils (SSCs) provide some short-term training courses
Course Availability 	-78% of all ITIs have at least one auto sector related course - Overall, 37 auto sector related courses are there - Only one course specific to EVs (Mechanic Electric Vehicle) is currently taught at 163 ITIs= (with a seating capacity of 4,584	PMKVY - 13% of the training centres established under PMKVY offer courses related to automobile - Total number of 523 centres offer training on automobile-related job roles (about 40 job roles) - The 523 centres have a training capacity of approx. 54,000 students - NAPS - 8 out of total 34 apprenticeship courses are related to EVs & electronics - Since 2018, 0.6 million apprentices have been trained under NAPS for the automobile sector	- Limited courses for EVs are available by SSC. Only 13 out of 137 qualification pack courses provided by ASDC are on EVs - Power Skill Sector Council (PSSC) also provides some training related to EV charging stations

Figure 8: Trainings under the EV Skilling Infrastructure (Source - iForest)

GAPS IN SKILLING ECOSYSTEM

While India has made considerable progress in developing its skilling ecosystem to support the EV transition, several challenges continue to impede the industry's ability to fully capitalize on the potential of electric mobility:



SHORTAGE OF SKILLED WORKFORCE

A significant gap exists in the availability of workers trained in EV technologies, which risks slowing down the industry's ability to meet the growing demand for electric vehicles.



SERVICE PROVIDER DROPOUT

The EV repair sector is also prone to the risk of attrition among mechanics and service providers due to low income, lack of transparency in career progression, as well as insufficient technical knowledge.²²



INFRASTRUCTURE DEFICIENCIES

A lack of specialized training centers equipped with modern tools and technologies poses a major challenge. Existing centers often suffer from low training capacity and outdated facilities



RAPID TECHNOLOGICAL ADVANCEMENTS

The fast-paced evolution of EV technology makes it difficult for skilling and educational institutions to keep their curricula up to date. This creates a challenge for institutions to ensure their training programs remain relevant and future-proof, and for individuals to continuously upgrade their skill sets.



QUALITY AND EFFECTIVENESS OF TRAINING

Despite efforts to scale training initiatives, there remains a disconnect between certification and actual employability. Many workers, while certified, are not job-ready due to gaps in the quality, rigor, and practical relevance of the training provided.



FOCUS ON SOFT SKILLS AND LIFELONG LEARNING

As the industry evolves, so too must the workforce. Beyond technical skills, there is a need to emphasize the development of soft skills, such as communication, problem-solving, and teamwork, as well as adaptability and a mindset geared toward continuous learning.



GEOGRAPHICAL DISPARITIES IN ACCESS TO TRAINING

There is an uneven distribution of training facilities, with urban areas better equipped than rural regions. This gap can hinder the nationwide adoption of EV technologies and limit employment opportunities for workers in less developed regions.

05 STRATEGIES & RECOMMENDATIONS

In the previous paper of this series on 'Navigating a People-Centric Approach in India's Shift to E-mobility', the following strategies were laid out with respect to skilling of workforce for EV transition.

PILLARS FOR TRANSITION	OBJECTIVE	STRATEGIES
 Targeted Skilling Initiatives and Knowledge Enhancement	Build stakeholder capacities	- Assess upskilling and reskilling needs. - Map available training courses. - Link stakeholders to training institutions. - Provide financial aid during training - Focus on employment-linked training. - Develop customized training modules. - Utilize e-learning platforms for flexible training options. - Partner with industry experts for hands-on training. - Create mentorship and apprenticeship programs. - Monitor and evaluate training outcomes.

Figure 9: Strategies for Skilling Initiatives aiding EV Transition

(Source - 'Navigating a People-Centric Approach in India's Shift to E-mobility', Vasudha Foundation)

Based on the strategies laid out in the previous paper and in addition to them, the following recommendations are proposed to enhance and optimize the skill development initiatives:

Incentivize industry players for conducting successful reskilling programs	Eg. In Tamil Nadu's EV policy²³, there is a provision wherein automotive companies are eligible for a 10% Upskilling Allowance for upskilling their existing workforce in the EV production line. Towards this, the policy allows companies to avail training subsidies of Rs. 4000 per worker for 6 months, and Rs. 6000 in case of women, SC/ST community, person with disability or transgender employees.
Move beyond traditional apprenticeship models²⁷	Move beyond traditional apprenticeship models²⁴ and adopt certification-based models, since certificate programmes get more interest in India. Such programmes can include a hybrid learning approach including classroom learning along with industry training from an early stage in the education. Eg. Dual System of Training (DST) initiative implemented in Haryana wherein students alternate learning between academic education and industry training. This provides them practical industry experience without sacrificing time or income, unlike apprenticeship. Through this approach, partially skilled workers can find work and get upskilled while working. Similar initiatives have also been taken up in Gujarat, Madhya Pradesh, and Uttar Pradesh as well.

State-level Planning Body

It will be extremely important to develop and invest in effective skilling programmes, through coordination between the government, industry, skilling agencies, educational and training institutions, and other concerned entities. To facilitate a coordinated approach, a Skills Taskforce²⁵ can be developed at the state level, consisting of members of original equipment manufacturers (OEMs), auto component manufacturers (ACMs), skill councils, training institutes, and research institutions. The Taskforce can support the generation of data on workforce profile, including their education and skills levels, to assess education and skill gaps, and enable the design of training, academic and vocational programmes.

Leverage Philanthropic Support

Philanthropic organizations can play a crucial role in ensuring a just and equitable transition by bridging critical gaps through funding innovative training models (eg. mobile training units for remote areas), supporting informal sector workers, and catalyzing multi-stakeholder partnerships. For instance, they could create and support specialized programs targeted for different players like small auto component manufacturers, local garage mechanics, etc. They could also facilitate the development of training content, particularly in local or regional languages for a wider reach. Also, they can enhance academic institutions' capacity by funding their research centers and establishing industry-academia linked research/training units to bridge the gap in these two.

Foster and support Industry-led Skilling Initiatives

Eg. Hero Electric, in partnership with ReadyAssist²⁶, has launched a two-year initiative to train 20,000 mechanics in servicing EVs. The initiative started in 2022 and offers both on-site training as well as online modules to equip mechanics with the skills needed to repair and maintain various EV models. The goal is to address the growing demand for EV mechanics and create a sustainable ecosystem for the EV industry in India. By providing comprehensive training, the initiative aims to help mechanics adapt to the changing market and secure employment opportunities in the growing EV sector. *(An interview with the leaders of this initiative is captured as Annexure B to this Briefing Paper to capture lessons learnt and experiences gained.)*



06

INDUSTRY-LED SKILLING SOLUTIONS: INTERVIEW WITH HERO ELECTRIC & READY ASSIST

This section provides a synthesis of the interview conducted by Vasudha Foundation Team of Mr. Manu Kumar, Head of Marketing & Corporate Communication, Hero Electric and Mr. Vimal Singh, Founder & CEO, Ready Assist. The interview took place on Saturday, 23rd March 2024.

To understand the major role private sector players can have in enabling the transition for their workers and their business, an interview was conducted with Hero Electric, a company leading the electric two-wheelers (E2Ws) revolution in India and Ready Assist, another leading company providing 24/7 roadside assistance, emergency support, and on-the-spot repair services for bikes, cars, and electric vehicles (EVs). They are partnering together to address a crucial aspect of this transition – ensuring a skilled workforce.

This section provides insights of their approach, rationale and details of the initiative focused on upskilling mechanics in repair and maintenance of E2Ws for safeguarding their livelihoods in the evolving automotive landscape.

PHILOSOPHY - A FAIR & INCLUSIVE WORKFORCE TRANSITION FROM ICE TO EV

Q. How is Hero Electric shaping its sustainability goals and addressing climate change?

Hero Electric's business is intrinsically aligned with sustainability, as the company manufactures and offers E2Ws to the market which ensures zero tailpipe emissions. Electrifying two-wheelers, a primary urban transport mode in India, will reduce pollution in not just top tier cities, but also in lower tier cities, and hence, will contribute to India's net-zero targets.

Q. What is your perspective on ensuring a fair & inclusive workforce transition from the ICE to EV sector?

India has a well-established two-wheeler manufacturing ecosystem built over decades. The transition to EVs will have significant financial implications across this ecosystem - from manufacturers and OEMs to the mechanics, service station workers, and other workforce employed.

EV ecosystem requires different expertise, assembly lines, and adherence to new norms compared to ICE vehicles. Companies and dealers entering this space will need to invest heavily in new infrastructure, machinery, and workforce training. Thus, comprehensive reskilling and upskilling programs are vital to ensure the existing workforce can transition smoothly.

Therefore, to enable a fair and inclusive transition, a balanced approach is needed - gradual implementation allowing the ICE industry to adapt, government support through clear policies/incentives, collaboration between stakeholders for workforce development initiatives, and financial assistance to companies/dealers for infrastructure upgrades and employee training. By addressing the needs of workers, communities, and the surrounding ecosystem in this manner, a fair and inclusive shift from ICE to EVs can be achieved.

Q. How can Hero Electric ensure a fair and inclusive ICE to EV shift for its workforce as well as the ecosystem?

As noted earlier, reskilling the workforce is a vital aspect of a fair and inclusive transition. With the industry's expansion, more trained roadside services are required, so upskilling local repair shops is necessary. This is true for 4 wheelers as well, but particularly relevant for small garages that cater more to E2Ws and E3Ws since

riders cannot afford to travel far to service stations for basic repairs. An independent initiative was taken by Hero Electric to train roadside mechanics, also called professional garage owners (PGOs), in basic servicing and repair skills for EV two-wheelers in the cities where Hero Electric was selling them. Hero Electric has now partnered with Ready Assist, to accelerate this training.

EXPERIENCE AND LEARNING

Q. Please elaborate on the need and rationale behind the partnership between Hero Electric and Ready Assist?

This partnership's main objective is to train and upskill 20,000 mechanics for servicing electric two-wheelers. This partnership is important to ensure that the right kind of manpower which understands electric mobility is available. Partnering with Ready Assist is helping Hero augment the training of mechanics as our reach and expertise is limited in this area. Additionally, Ready Assist already has a database and relationship with these roadside mechanics who are predisposed to learning and upskilling themselves in electric mobility. This makes the intervention easier, faster and more widespread.

Further, the key objectives behind the partnership were:

- Empowering mechanics' lives by ensuring existing skills remain relevant.
- Building an ecosystem for a smooth transition by imparting serviceability skills to mechanics. (Since serviceability of the EV is a major challenge for OEMs)
- Enhance customer confidence in getting servicing support for EV products to increase product adoption in the market.
- Building road safety to prevent multi-vehicle accidents by skilling mechanics for providing immediate roadside assistance.

Q. Which geographies are being focused on for skilling mechanics?

Initial focus was on Tier 1 cities. Later, Tier 2/3 cities were also roped in based on EV adoption, especially in B2B fleets. Currently the program covers across ~100 cities, with plans to upskill Ready Assist's entire 12,000-mechanic network.

Q. How did Ready Assist identify and target the beneficiaries of the partnership? What were the challenges faced, if any.

Since training everyone for scratch will be costly, Ready Assist felt it is necessary to empower, skill and build the competency of the existing mechanics to ensure they don't fall out of the ecosystem during the transition. Hence, Ready Assist targeted training towards those mechanics it was already associated with.

One of the key challenges faced during the training was getting mechanics interested in multi-day training, as this would impact their daily wages. Ready Assist overcame this by:

- Investing in the innovative "Mecademy" training program (within Ready assist) with 12 traveling trainers to rapidly upskill mechanics across India in EV repair and servicing
- Observing and replicating OEM skills via train-the-trainer approaches
- Rapidly sharing skills across India without disturbing mechanics' working hours or earnings
- Using success stories of increased earnings to incentivize participation in training
- Building EV service ecosystem even in remote areas with low volumes

Q. What advice do you have for designing and implementing effective skill mapping and training program?

In addition to general mechanical requirements, even basic E2Ws have advanced electronics and IoT compared to ICE vehicles, thus higher skill levels are required for handling EV's electronic/software aspects. As EVs get more sophisticated with AI and upgradeability, the skill gap widens further. Thus, for training to be effective they need to be comprehensive and focus on multiple-levels.

Q. How did Ready Assist assess garage owners' or mechanics' skill levels for effective training?

The skill set required to work on repairing/maintaining EVs depends on 2 factors – (i) the kind of two-wheeler (high electronics or low electronics functionality) and (ii) the type of repair to be undertaken (Beginner – external servicing eg. changing punctured tire; Intermediate – basic internal servicing; and Advanced – skillset similar to OEM's engineers or in-house mechanics).

Ready Assist provides repair and maintenance services falling under the NSQF Levels 3-5. However, since it provides standard services for roadside assistance with regards to EVs – this involves replacement/plug and play of the affected EV part (as against services for ICE vehicles which may involve complicated repairs and services of the affected part itself instead of replacing it) – thus, it is suggested to build and have a higher share of workforce which have the basic and intermediate level of skillsets.

Q. What will be the new role of the workforce and how will increased E2W service-time impact mechanics' earnings?

Ready Assist's experience shows mechanics' earning ability has increased due to:

- Advanced EV skills allowing higher charges
- Expanded multimedia/infotainment system skillsets
- Ability to provide additional battery, infotainment, GPS services
- Currently limited supply of trained EV mechanics

However, once EV skills become commoditized, the premium may reduce.

Q. How and where can the policy for informal workforce's right to service/repair be placed in this?

Upskilling depends on an individual's education level, commitment, and understanding through a phased learning process. Once trained, mechanics may become OEM dealers or sub-dealers too, upon meeting certain laid down criteria. Thus, the process must be democratized and open to anyone. However, the person concerned should be willing to undergo systematic and certified learning.

FAIR AND INCLUSIVE TRANSITION FOR BUSINESSES

Q. What role can the business play to minimize the impact on industry, workers, and the whole ecosystem?

Businesses can play a role in enabling just, fair and inclusive transitions through:

- Ensuring a phased assembly line approach - keep ICE running while adding EV manufacturing capabilities gradually
- Continuous training and upskilling of workers as technologies evolve
- Collaborating across players to build the new EV industry

In addition to this, the following actions by suitable stakeholders can aid in minimizing the impact:

- Adopting an evidence-based and systems level approach to understand how to map India's workforce and their requirements
- Modify current courses by bodies like ASDC/NSDC and tweak them into a focused program on nitty gritty of servicing and preparing EVs
- Having robust assessment and certification mechanisms rather than merely issuing certificates. An independent standardization/certification body overseen by the government and OEMs is needed to certify skilled mechanics
- Stringent audits on organizations to ensure there is no misuse of training funds
- Channelize government grants
- Investments may be directed for targeted company-initiated training programs providing effective training
- Creating a common digital platform to identify skilled workers

The Hero Electric-ReadyAssist partnership demonstrates how industry-led initiatives can effectively address the EV transition's workforce challenges. Their experience highlights three key success factors: (1) the importance of innovative training approaches that don't compromise workers' current earnings, (2) the potential for increased income opportunities for reskilled workers in the EV ecosystem, and (3) the need for standardized certification systems supported by both industry and government. This case study reinforces that successful workforce transition requires collaborative efforts between OEMs, service providers, and training partners.



ANNEXURE

Provided below is the list of existing job roles which will become obsolete across the Automotive Value Chain.

Existing Jobs	Manufacturing and R&D	Dealerships	Service & Maintenance
	• Body shop manager and technician • Refinisher • Paint manager and technician • Auto electrical manager and technician • Tool room operator • Manual spot welder and assistance • Assembler and fitter (aggregate) • Routing and simple assembly job • Routine machine loading/unloading • Logistics internal material transfer and storage • Quality control manager • Packing executive • Welding assistant • Production (forging) • Production machining	• Lot manager • New vehicle pack manager • Accessories manager • Sales executive • Washing and maintenance staff	• Engine repair technician • Service technician • Sanding and priming jobs • Body paint technician

Table Source: [Vasudha Foundation Analysis](#) and [EY Analysis](#)

ENDNOTES

- 1 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1941114>
- 2 <https://vahan.parivahan.gov.in/vahan4dashboard/vahan/view/reportview.xhtml>
- 3 <https://economictimes.indiatimes.com/industry/renewables/repair-or-replace-insurers-in-this-country-sending-electric-cars-to-junk-yards-due-to-mechanic-shortage/articleshow/109274656.cms?from=mdr>
- 4 <https://www.theguardian.com/environment/2024/apr/26/australias-skilled-mechanics-shortage-forcing-insurers-to-write-off-electric-vehicles-after-minor-accidents>
- 5 <https://www.utilitydive.com/spons/2-nevi-hurdles-uptime-and-bottlenecks/634971/>
- 6 <https://www.autonews.com/mobility-report/broken-ev-chargers-need-more-certified-technicians>
- 7 https://www.pmindia.gov.in/en/news_updates/pms-address-at-the-inaugural-session-of-journey-towards-viksit-bharat-a-post-union-budget-2024-25-conference-by-confederation-of-indian-industry-cii/?comment=disable
- 8 https://www.indiabudget.gov.in/doc/Budget_Speech.pdf?ref=static.internetfreedom.in
- 9 <https://www.livemint.com/politics/policy/pm-narendra-modi-national-conference-chief-secretaries-employment-skilling-entrepreneurship-tier-2-tier-3-cities-11725176152440.html>
- 10 <https://iforest.global/wp-content/uploads/2024/04/Report-7-Automobile-Jobs-Report.pdf>
- 11 <https://skillsip.nsdindia.org/sites/default/files/kps-document/skillreqinautomotivesector.pdf>
- 12 <https://skillsip.nsdindia.org/sites/default/files/kps-document/skillreqinautomotivesector.pdf>
- 13 <https://skillsip.nsdindia.org/sites/default/files/kps-document/skillreqinautomotivesector.pdf>
- 14 <https://iforest.global/wp-content/uploads/2024/04/Report-1-National-Report-1.pdf>
- 15 <https://iforest.global/wp-content/uploads/2024/04/Report-7-Automobile-Jobs-Report.pdf>
- 16 https://www.business-standard.com/industry/auto/auto-industry-needs-200k-skilled-people-by-2030-to-meet-30-ev-target-124071600619_1.html
- 17 <https://iforest.global/wp-content/uploads/2024/04/Report-7-Automobile-Jobs-Report.pdf>
- 18 https://www.business-standard.com/industry/auto/auto-industry-needs-200k-skilled-people-by-2030-to-meet-30-ev-target-124071600619_1.html
- 19 https://www.business-standard.com/industry/auto/auto-industry-needs-200k-skilled-people-by-2030-to-meet-30-ev-target-124071600619_1.html
- 20 National Skills Qualification Framework (NSQF) is a system as per which the job skills of workforce is ranked between basic to advanced, viz. Level 1 to 10. NSQF Levels are a critical aspect of the discussion on skilling workforce for EV transition since it enables industry and policy-makers to assess the relative value of a worker's qualification as well as take informed decisions for workforce planning.
- 21 <https://aeee.in/our-publications/skill-development-and-inclusive-growth-opportunity-in-indias-ev-sector/>
- 22 Captured during discussions with ReadyAssist.
- 23 https://investingintamilnadu.com/DIGIGOV/StaticAttachment?AttachmentFileName=/pdf/poli_noti/TN_Electric_Vehicles_Policy_2023.pdf
- 24 <https://olawebcdn.com/ola-institute/skilling-indians.pdf>
- 25 <https://iforest.global/wp-content/uploads/2024/04/Report-7-Automobile-Jobs-Report.pdf>
- 26 <https://heroelectric.in/heroelectric-joins-hands-with-readyassist-to-train-20000-mechanics/#:~:text=Hero%20Electric%20joins%20hands%20with%20ReadyAssist%20for%20training%2020%2C000%20mechanics,CEO%20%26%20Founder%20Vimal%20Singh%20stated.>
- 27 <https://olawebcdn.com/ola-institute/skilling-indians.pdf>

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This Briefing Paper is a part of Vasudha's knowledge series on mainstreaming discourse on People-centric Energy Transitions in India