



# Changing tides of the Pune automotive industry



February 2024

[kpmg.com/in](https://kpmg.com/in)



# Contents

**Foreword**

**Executive summary**

**Pune – A vibrant automotive hub**

**Trends impacting the automotive industry in India**

**E-mobility**

Overview

Impact of the trend

Opportunities emerging due to the trend

**Alternative fuels**

Overview

Impact of the trend

Opportunities emerging due to the trend

**Make in India**

Overview

Impact of the trend

Opportunities emerging due to the trend

**Emerging technology**

Overview

Impact of the trend

**Challenges faced by MSMEs**

**Ecosystem support required**



# Foreword

Pune is 9<sup>th</sup> largest city in India by population. It is 8<sup>th</sup> largest in the table of Indian cities by sq. km. area. The city is 6<sup>th</sup> biggest in tax contributions to the nation after Mumbai, Bengaluru, Delhi, Chennai and Hyderabad. Pune District ranks one of the top 5 for merchandise exports, amongst more than 800 districts in India and it ranks first amongst all districts for exports of engineering goods.

Pune's significant contributions to merchandise exports, especially in the engineering sector, are attributed to the substantial presence of the automobile and engineering industries in the region. Major Indian and global automotive Original Equipment Manufacturers (OEMs) are located in Pune, fostering a robust supply chain comprising thousands of Micro, Small, and Medium Enterprises (MSMEs) in the auto component sector. This sector sustains hundreds of thousands of jobs, supporting numerous families.

The aforementioned context emphasizes the importance of the 'mobility' sector for Pune region's economy and, consequently, the significance of 'new mobility,' particularly based on alternative fuels, especially electric batteries. Changes in fuel types necessitate adjustments in vehicles and, consequently, the required components. For the sake of the region's economy, it is crucial that all stakeholders, especially MSMEs, engage in understanding these trends and proactively adapt to them.

Recognizing the importance of comprehending the emerging trends of 'new mobility' and their implications, the Maharashtra Chamber of Commerce, Industries, and Agriculture (MCCIA), a longstanding institution with a 90-year rich legacy in the region,

partnered with the leading consulting firm, KPMG in India, to conduct a comprehensive study and publish a report on this theme.

Over the past few weeks, we have visited over 50 companies in the region, engaging with key decision-makers from both large corporations and MSMEs. The study involved face-to-face interviews and conducted surveys. This report synthesizes the findings and provides insights into the impact of current trends, the opportunities emerging for Indian OEMs, challenges faced by automotive component suppliers (mostly MSMEs), and the necessary support ecosystem required for MSMEs.

The recommendation section of the report highlights the need for upgrading the facilities of the largest common facility center in the region, i.e., the Auto Cluster. It also recommends comprehensive support mechanisms for MSMEs, including access to R&D facilities, technical expertise, and production services. The establishment of a ramp-up factory for key auto components is one of the key recommendations.

The recommendations in this report will be invaluable for both auto sector companies and public policymakers, providing guidance on how to not only survive but thrive in these transformative times.

This extensive exercise wouldn't be possible without the active participation of KPMG in India and MCCIA leaders. Our thanks are due to Avi Ranade, Juzer Miyajiwala, Jeffrey Jacob, Rohan Rao, Pranav Sarpotdar, Anirudha Totewar, Kesar Majethia, and Nikhil Jain."



**Prashant Girbane**  
Director General  
Maharatta Chamber of Commerce,  
Industries and Agriculture (MCCIA)



**Deepak Karandikar**  
President  
Maharatta Chamber of Commerce,  
Industries and Agriculture (MCCIA)

# Executive summary

The rise of innovative technologies such as alternative fuels, connected cars, IOT, and emerging trends such as electric vehicles (EVs), sustainability have impacted the automotive industry in India, especially in the state of Maharashtra. Automotive companies such as original equipment manufacturers (OEMs), automotive component manufacturers (Tier 1, 2) and service providers have to evolve rapidly to cope with the uncertainties and challenges posed by these innovations. Rapid adoption of the changing requirements of an evolving industry is quickly becoming the new normal and companies are required to adapt to this changing environment to survive. These new technologies have levelled the playing field for new entrants and significantly reduced the existing entry barriers. Future competition will emerge from diverse quarters and hence players would require to be agile and innovative in order to defend their turf against this potential new competition. The future will also not require as many component suppliers which means that the existing players will need to increase their investment in creating IP and reskilling human capital so that they remain relevant.

E-mobility, which is the most talked-about of all the themes, may witness varied adoption levels across different segments (2W, 3W, PVs, CVs) of the auto industry. The industry is currently in a flux, and players are still adjusting their portfolios and capacities to align themselves to the varying adoption levels across these segments. However, the use case of EVs has now been established and the transition of ICE vehicles to EVs has begun. Companies that are able to reconfigure their business models and align their supply chains to the requirement of the EV industry will be better able to tap into the opportunities that will emerge from this transition. Also, since the technology landscape is evolving rapidly, aspects that are relevant today can become obsolete very quickly. Hence, investing in R&D and innovation is no longer optional but it is becoming a source competitive differentiation and a means of survival.

In the Indian context, a historical dependence on imports to meet fuel requirement has necessitated an adoption of cheaper, cleaner fuel in a journey towards becoming increasingly self-reliant. Use of alternative fuels will require adoption of new

technologies that will be required to process these fuels and generate energy to run the conventional vehicles/machines. These will offer auto component manufacturers as well as technology providers opportunities to augment their product portfolio to tap into these innovative technologies and cater to the customer requirement.

Over the past decade, the government's impetus on Make in India and the recent global transition towards a China+1 manufacturing strategy as a way of de-risking supply chains are likely to provide a thrust to India's manufacturing sector. Automotive sector will be an indirect beneficiary of this theme and it will enable the companies that operate in this space to tap into the requirement of both the domestic and export market. Pune being one of the key automotive manufacturing hubs in India and a strong base of MSMEs, is expected to benefit from these trends.

Several emerging technologies are also revolutionising the automotive value chain. We find that the current adoption of these technologies has yielded mixed results, with several adjustments and improvements required to enable wider adoption. Nevertheless, these trends bring several opportunities for MSMEs to enhance their readiness for the long term. New products, changing specifications, standards and innovations will continue to disrupt the automotive industry. As the Indian government continues to promote net-carbon neutrality and the global automotive companies start focusing on sustainability initiatives, we anticipate significant changes in the value chain across all key segments of the Indian automotive industry.

MCCIA and KPMG in India collaborated to understand the impact of these changes in the Pune automotive cluster. We interviewed several stakeholders across the automotive value chain, including large Indian and multinational OEMs, Tier 1 & Tier 2 Auto-Component suppliers including Micro, Small and Medium Enterprises (MSMEs) in the Pune cluster. This report is a summary of the one-on-one dialogues and discussions, group interviews and surveys conducted with key participants in the Pune cluster. The report provides insights on the impact of current trends and the opportunities arising therefrom, challenges faced by automotive suppliers, and the ecosystem support required by the MSMEs.

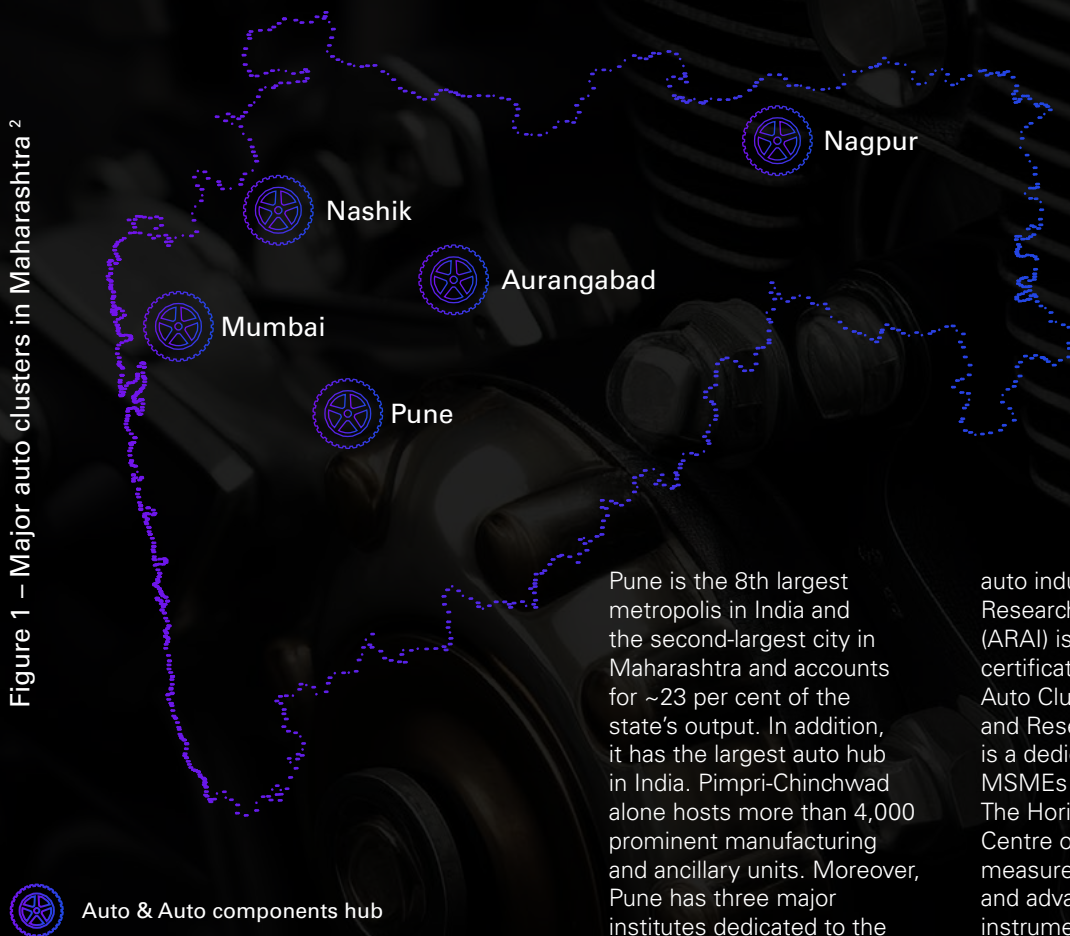


# An overview of Pune

## A vibrant automotive hub

The state of Maharashtra is a leading producer of automobiles and auto components in India. Out of the total all-India production, more than 20 per cent of the automobiles and >21 per cent of automotive components are produced in Maharashtra. The key auto clusters in

Maharashtra include – Pune, Nashik, Aurangabad, Mumbai and Nagpur. The state's automotive industry accounts for 7 per cent of the state's GSDP and 15.3 per cent in terms of industrial GSDP.<sup>1</sup>



Pune is the 8th largest metropolis in India and the second-largest city in Maharashtra and accounts for ~23 per cent of the state's output. In addition, it has the largest auto hub in India. Pimpri-Chinchwad alone hosts more than 4,000 prominent manufacturing and ancillary units. Moreover, Pune has three major institutes dedicated to the

auto industry. The Automotive Research Association of India (ARAI) is an R&D, testing, and certification organisation. The Auto Cluster Development and Research Institute is a dedicated facility for MSMEs that caters to OEMs. The Horiba India Technical Centre oversees emission measurement systems and advanced analytical instruments.

<sup>1</sup> Pune – The Industrial Hub of India, presentation by MIDC CEO on 1st March 2021 at MCCIA's Pune International Business Summit 2021, accessed on 8th August 2023

<sup>2</sup> Pune – The Industrial Hub of India, presentation by MIDC CEO on 1st March 2021 at MCCIA's Pune International Business Summit 2021, accessed on 8th August 2023

Figure 2 – Maharashtra electric vehicle policy 2021<sup>3</sup>

### Key targets to be achieved

- **Share of EVs in new vehicles:** Increase share of EV to 10% in new vehicle registration till 2025 within all vehicles. EV share across four-wheelers to be 5%, for three-wheelers to be 20% and across two-wheelers to be 10%
- **Share of EVs in urban fleet:** At least **25%** of the urban fleet operated by the fleet aggregators for e-commerce companies, last-mile logistics players to transition to EVs by 2025
- **Electrification of public transport:** In the six targeted urban agglomerations (Mumbai, Pune, Nagpur, Nashik, Aurangabad and Amravati), achieve **25%** electrification of public transport by 2025. MSRTC to convert 15% of its existing bus fleet to electric

Region	Target EV charging stations
Greater Mumbai	1500
Pune	500
Nagpur	150
Nashik	100
Aurangabad	75
Amravati	30
Solapur	20

### Ecosystem development initiatives

- **R&D facilities:** Incentives will be provided to make the state more lucrative for setting up manufacturing and R&D facilities related to EVs
- **Enhance battery manufacturing incentives:** Establish >1 Gigafactory for the manufacturing of Advance Chemistry Cell (ACC) batteries in the state by offering incentives that complement Gol's PLI scheme
- **Charging infrastructure:** New residential buildings will be mandated to have at least 20% of the total parking spaces as EV ready, of which 30% should be in common parking spaces or parking spaces unallotted to any individual residence owner
- Public and semi-public charging stations shall be eligible for charging infrastructure incentives as per:

Type of charging station	Slow	Moderate
Incentive amount	60% of cost	50% of cost
Maximum incentive per station (INR)	10,000	5,00,000
Maximum number of stations to be incentivized	15,000	5,000

### Demand generation initiatives

- OEM will be given incentives based on the battery capacity of the vehicle:

Vehicle segment	Incentive available (INR/KWh)	No. of vehicles to be incentivized	Maximum Incentive per vehicle (INR)
e-2W	5,000	100,000	10,000
e-3W autos	5,000	15,000	30,000
e-3W goods	5,000	10,000	30,000
e-4W cars	5,000	10,000	1,50,000
e-4W goods	5,000	10,000	100,000
e-buses	10% of cost	1,000	20,00,000

- OEMs selling EV with battery warranty of >5 years will be given an incentive of **4%** of total vehicle cost capped at **INR 6,000**. EVs sold with assured buyback up to **5 years** would be given an incentive of **6%** of the vehicle cost capped at **INR 10,000**
- Buyers switching to EV will be provided scrappage incentive for ICE vehicle as per:

Vehicle segment	Scrappage incentive
Two-wheeler	Up to INR 7,000
Three-wheeler	Up to INR 15,000
Four-wheeler	Up to INR 25,000

As can be referred from Figure 2, the Maharashtra government has also undertaken several initiatives such as the

Maharashtra EV Policy, 2021 to enhance the resilience and readiness of the state's automotive ecosystem.

<sup>3</sup> Maharashtra Electric Vehicle Policy 2021, Maharashtra State Innovation Society, 27th July 2021, accessed on 12th January 2024



# Trends impacting the automotive industry in India

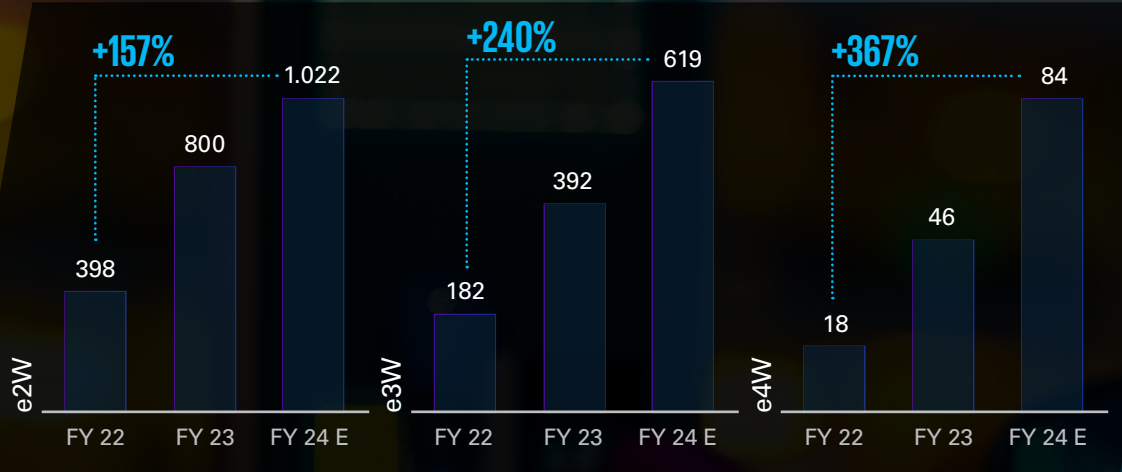


# E-mobility

The transition from ICE to EVs has been recognised as a transformative story within India's automotive sector and public policy has played a vital role in promoting this transition. The government's think tank, National Institution for Transforming India (NITI Aayog), has stated that various policies including Faster Adoption

and Manufacturing of Hybrid and Electric Vehicles (FAME II), are expected to significantly drive the transition to EVs across various vehicle segments. In the 2023 Union Budget, the government has increased FAME II allocation by 78%.<sup>4</sup>

Figure 3: EV historical sales and sales growth (in 000 units)<sup>5</sup>



In FY23, total EV sales from all vehicle segments reached ~1.24 Mn units, growing by ~107% y-o-y from FY22. Total EV sales are expected to reach ~1.73 Mn by the end of FY24 which would be a growth of ~39 per cent over FY23. Amongst all vehicle segments, 2W segment is witnessing the highest EV sales, at ~0.8 Mn units in FY23, registering a ~101 per cent y-o-y growth over FY22. The 2W segment was followed by the 3W segment, with EV sales of ~0.4 Mn units, growing by ~115 per cent over FY22. EV sales in the 4W segment reached ~0.05 Mn units in FY23, increasing by ~154 per

cent over FY22. (See Figure 3)<sup>6</sup>.

Further, the EV penetration is higher in 2Ws and 3Ws than four-wheeler (4Ws) due to their well-established use cases and their economic viability - both in terms of pricing and fuel efficiency. In FY22, the savings in total cost of ownership (TCO) for EVs compared to internal combustion engine (ICE) vehicles was the highest in the 2W segment at 43 per cent, followed by 27 per cent in the 3W segment, 13 per cent in the buses segment and 5 per cent in the 4W/PV segment.

Figure 4: A mix of enabling factors on demand, supply, and regulatory front likely to fast-track India's EV journey<sup>7</sup>

## Demand

### Fuel price hikes and falling battery prices cementing the purchasing price parity:

- Total cost of ownership for 2W and 3W is 10-15 per cent lower than their internal combustion engine (ICE) counterparts.
- 4W segment is expected to reach total cost parity in 1-2 years
- Owing to lower number of moving parts, the maintenance cost of an EV is 40-50 per cent lower than an internal combustion engine

### Ease of use and convenience:

- EVs require infrequent maintenance checks compared to ICEs
- Technological advancements in charging, driving ranges, battery life are anticipated to alleviate consumer anxiety and lead to faster adoption

### Sustainable choices are driving consumerism:

- New generation drivers are more environmentally conscious and likely to opt for green mobility solutions
- Increasing consumer willingness to pay premium for purchasing an EV

<sup>4</sup> News Article: Budget 2023 | FM revises FAME outlay for FY24 to Rs. 5,172 Cr, Moneycontrol, accessed on 8th August 2023

<sup>5</sup> Parivahan Website, Ministry of Road Transport, accessed on 12th January 2024



## Supply

**Growing network of suppliers and connectivity across value chain:**

- Leading EV players are ramping up production to grow market presence
- Global EV players and traditional ICE players have marked their entry into India's EV sector
- Public-private partnerships are proliferating charging solutions pan-India
- Various partnerships between OEMs and OMCs for battery swapping solutions

**Improving product specifications:**

- Higher customisation of design to suit the Indian market
- Better ARAI certified battery range
- USD700 million of investment has been raised by 500+ startups, working on e-mobility solutions

## Government incentives

**Government of India's (GoI) goal to shift to clean mobility:**

- Shift to EVs is expected to enable India in fulfilling its global commitments to the UN to lower carbon footprint

**Central and state incentives to promote EV adoption:**

- FAME-II aims to provide ~INR10,000 crore of demand incentives for EVs
- State level EV policies providing upfront cost incentives, road tax waiver, reimbursement of stamp duty, registration cost, GST etc.

**Localisation of supply chain:**

- 100 per cent FDI for EV assembly and INR18,000 crore PLI scheme for ACC Battery manufacturing to incentivise domestic production

**Expansion of EV ecosystem:**

- FAME-II has sanctioned more than 2600 charging stations pan India
- E-Amrit platform provides comprehensive and accurate information on EV for new users

Advantages of EVs such as low fuel consumption, ease of use, sustainability, economic viability, improved features and government incentives have created a strong use case to consider transition from ICE to EVs and rising fuel prices have played a crucial role in further accelerating this shift towards electric mobility in the 2W and 3W segments.

However, within the 4W segment, the adoption of EVs in the passenger vehicles (PVs) segment remains low, but has been growing. Currently there are several challenges in this market, ranging from lack of charging infrastructure, limited product range and high initial cost of vehicle. Consequently, the growth of EVs in the PV segment is expected to lag other vehicle segments but is anticipated to pick up once these challenges are resolved. With improvements in battery technology and growing base of charging infrastructure, these challenges are slowly getting addressed, which augurs well for the EV growth story.

Commercial vehicles (CVs) (especially LCVs), on the other hand, are expected to experience relatively higher EV penetration than the PV segment due to multiple factors. The light commercial vehicles (LCVs) segment has a more established and robust use case for EV penetration, particularly in the context of urban delivery due to better economics, high route predictability, ease of charging and improved product offerings which are expected to drive the shift from ICE to EV at a rapid pace. With a growth in e-commerce and associated shorter trips, EVs have seen a marked rise in adoption.

In the heavy commercial vehicle (HCV) segment, government-run public buses are anticipated to experience greater acceptance due to government subsidies and incentives. Lower maintenance cost further improves the TCO of such vehicles. In comparison, the private segment may witness limited off-take due to high upfront cost and lack of subsidies.



From Left to Right: Anirudha Totewar (KPMG in India), Pranav Sarpotdar (KPMG in India), Santosh Iyer (MD & CEO, Mercedes – Benz India), Prashant Girbane (MCCIA), Nikhil Jain (MCCIA)

**Charging infrastructure has a symbiotic relationship with the growth of the EV market and it will pick up pace once the market grows.**

**Santosh Iyer,**  
MD & CEO  
Mercedes-Benz India

<sup>6</sup> Pune – The Industrial Hub of India, presentation by MIDC CEO on 1st March 2021 at MCCIA's Pune International Business Summit 2021, accessed on 8th August 2023

<sup>7</sup> Alternative Fuels and its Impact on the Skill Required, KPMG and ASDC, accessed 8th August 2023



# Impact of the trend:

Increasing EV penetration could modestly disrupt existing product offerings of ICE component suppliers.

The Indian automobile industry is projected to witness growth across all segments over the next decade. India aims to double the size of its automotive industry to USD2.7 trillion by the end of 2024.<sup>8</sup> This growth can be attributed to factors such as an increase in household income, a rise in vehicle penetration and a young demographic population with an average age of 25 years.

Due to the slower transition from EVs to ICEs across 4W, HCV and LCV segments, the ICE dominance is likely to continue across these segments over the next decade. Moreover, given that the overall size of the Indian automotive industry is expected to increase, the existing share of ICE components will also increase in the near term, albeit at a lower rate.

The impact of the EVs on auto component manufacturers, especially MSMEs, is expected to be mixed. The increasing adoption of EVs will compel certain component

manufacturers to broaden or diversify their product offerings. As EVs have fewer components compared to traditional ICE vehicles, the demand for certain auto components is expected to decline. Approximately several moving parts including engines, transmissions components and simple motors, may become obsolete with the rise of EVs. Therefore, manufacturers and suppliers of such parts that are not required in EVs need to consider ways to adapt quickly to the long-term reality of EVs. Additionally, SMEs that operate within ecosystems centered around a single product / service offering—soon to be replaced by EVs—may face significant challenges in the long term. The impact will be severe for such suppliers that are unprepared for these changes and for those who are anticipating these changes to happen more gradually. Industry players have noted that even the current emergence of EVs in India was an abrupt shift and not a gradual transition. Therefore, those MSMEs that proactively prepare for the long-term reality of EVs will be more resilient and can plan for a sustainable growth in future.

<sup>8</sup> Page on Indian Automotive Sector, Invest India, accessed on 7 July 2023



# Opportunities emerging due to the trend:

EV transition presents many opportunities to the automotive ecosystem to create new offerings.

### New EV components

The emergence of EVs has created several opportunities to auto component suppliers ranging from new products introduction to adoption of entirely new business models (refer Figure 5). This has led to emergence of a new supplier ecosystem and due to the nascent stage of EV transition, there are minimal barriers for MSMEs to enter these established supply chains. They can even expect

to compete with well-established companies in providing essential components such as power electronic components, batteries, software, allied services, etc. to these EV players. Since several of the EV OEMs are themselves start-ups, breaking into the supply chains has been easier for these suppliers.

Figure 5: Obsolete components in ICE and new components in EV <sup>9</sup>

S.No	Unit	No longer needed in ICE	S.No	Unit	New addition in EV
1	<b>Fuel – system components</b>	Fuel tank	1	<b>Battery pack</b>	Battery module – battery cells
2		Fuel filter	2		Battery management system
3		Fuel pump	3	Battery cells	
4	<b>Engine components</b>	Pistons and connecting rods	4	<b>Inverter and power control unit</b>	DC to AC converter
5		Camshafts and valve train	5		DC to DC converter
6		Cylinder heads	6		Onboard charger
7		Exhaust manifolds	7	Rotor	
8		Crankshaft	8	Stator	
9		Block	9	<b>E-Motor</b>	Reduction gears
10		Alternator	10	Cooling channels	
11	Spark plugs	11	<b>Powertrain thermal management</b>	Powertrain thermal management	
12	Oil pan	12	<b>High – voltage power cables</b>	High – Voltage power cables	
13	<b>Engine cooling systems</b>	Radiator with fans	13	<b>Charging ports</b>	Charging ports
14		Coolant tank			
15		Coolant pump			
16	<b>Transmission</b>	Transmission			
17		AWD unit			
18		Driveshafts			

There are gaps in production capacities for new components required in an EV, such as battery modules, motors, harnesses, cables, and sensors, for which players are dependent on Chinese imports. The production capacity for these components needs to be built from scratch.

#### Ranjit Date

Managing Director  
Wipro PARI Pvt Ltd

<sup>9</sup> KPMG Analysis



Figure 6: Features of the battery management system (BMS) <sup>10</sup>

**Over-discharge protection** – This prevents the battery from being discharged below a certain safe level.

**Cell balancing** – This ensures each cell in the battery pack is equally charged and prevents damage to the cells and uneven charging.

**Short circuit protection** – This protects the battery against short circuits between cells or between an electrode and the ground.

**Current protection** – This protects the battery against excessive charge or discharge currents.

**Thermal runaway protection** – This offers protection by activating and shutting down the battery to prevent it from overheating, when temperature of a cell gets too high.

**Overcharge protection** – This prevents the battery from overcharging, which helps minimise or prevent damage.

The battery management system (BMS) and battery components, which are at the heart of an EV, comprise an estimated 40–50 per cent of the total EV cost. The BMS controls and monitors several critical parameters in the battery system (e.g. voltage of battery cells, state of charge, current, temperature, etc.). Unlike the traditional protection circuit module (PCM), the BMS undertakes energy balancing in cells to prevent fire incidents, regulates the battery pack and mitigates the risk of currents, overcharge, short circuits,

and thermal runaway (see Figure 6).

In the absence of regulations or standard specifications for BMS, the process of developing BMS domestically, demands a significant investment of time, money and effort. Stakeholders expect standardisation of specifications and eagerly anticipate further clarity. Once some of these issues are resolved, developing BMS indigenously should no longer pose a major challenge for the Indian automotive ecosystem.

<sup>10</sup>Technology at the forefront of Electric Vehicles, KPMG and CII (Confederation of Indian Industry), accessed by 31 July 2023

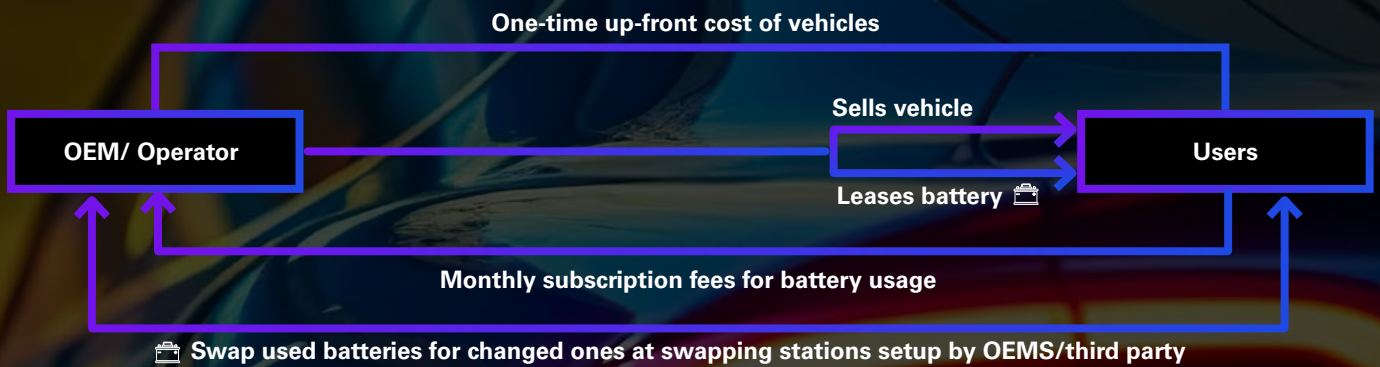
<sup>11</sup> Knowledge Paper on Alternative Fuels and its Impact on Skill, KPMG and ASDC, accessed on 8th August, 2023

**EV downstream**

The automotive suppliers have taken certain measures to establish an array of EV after-market services in India. Battery swapping, component recycling, and EV service support are few early initiatives, which helped drive this adoption. As

seen in Figure 7, battery swapping refers to the exchange of depleted batteries for charged ones, providing a faster alternative to recharging.

Figure 7. Battery swapping model <sup>11</sup>



In April 2022, the government published a draft Battery Swapping Policy and Interoperability Standards, wherein several measures were discussed to incentivise adoption. In particular, the draft policy mentioned that 20 per cent of the lease cost would be provided to EV owners as an incentive to use battery swapping services.

Battery swapping holds significant potential, particularly in the 2W and 3W segments where routes have higher predictability. However, the success of battery swapping depends on codes and standards for batteries.

Standardisation of batteries and associated components across the battery value chain will reduce the R&D effort that MSMEs would otherwise have to undertake for product development. This would reduce the time taken to go-to-market and enhance MSMEs competitiveness in the EV components landscape. However, standardisation may be a critical issue as OEMs consider batteries and the associated BMS as a key differentiating factor in EV. If standardisation is successful, a multitude of opportunities await MSMEs.

**Indian engineers and industries have the capability and capacity for developing battery and thermal management systems, as we find solutions to cost structure and meet total carbon neutrality goals. The Government of India has been supportive but a comprehensive solution for domestic manufacturing is needed to catalyze the speed and reduce dependence on imports.**

**Shailendra Jagtap**  
Managing Director and CEO  
John Deere India



From Left to Right: Anirudha Totewar (KPMG in India), Kesar Majethia (KPMG in India), Nikhil Jain (MCCIA), Shailendra Jagtap (MD, John Deere India), Prashant Girbane (MCCIA), Abhijeet Ranade (KPMG in India), Amit Joshi (KPMG in India)



# Alternative fuels

## Overview

Increasing consumer preference for clean energy and lower operating costs are causing a shift from traditional fossil fuels such as diesel and petrol to alternative fuels such as compressed natural gas (CNG), biofuels (ethanol) and hydrogen.

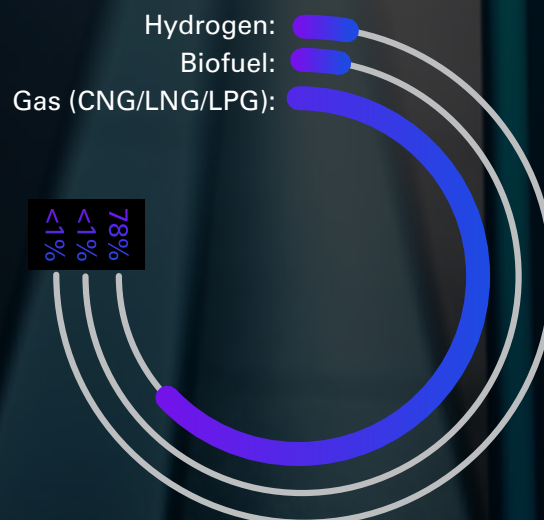
The Indian automotive industry has already witnessed a rapid growth in CNG vehicles. An improved fuel infrastructure, changing preferences for cleaner fuels and supportive government regulations are factors driving the adoption of CNG vehicles.

However, there is also an increasing interest in using biofuels, such as ethanol, for automobiles. For ethanol in particular, the government introduced the Ethanol Blended Petrol Programme (EBPP), which targeted the sale of petrol with a 10 per cent ethanol blend. The government has achieved the 10 per cent blending target ahead of its target and is now targeting 20 per cent blending and subsequent

higher blending rates in future.

As illustrated in Figure 8, the adoption of biofuel and hydrogen fuel vehicles is at a nascent stage. The 2022 National Hydrogen Mission Policy has outlined the roadmap to make India a self-reliant country in terms of energy requirement by 2047. In addition, the policy delineates steps towards increasing India's green hydrogen production capacity. As part of this policy, the government has also set up the Strategic Interventions for Green Hydrogen Transition (SIGHT) programme, which is geared toward two specific objectives – domestic electrolyser manufacturing and green hydrogen production.<sup>12</sup>

Figure 8: Share of vehicles running on alternative fuels, 2013–2022<sup>13</sup>



<sup>12</sup> National Hydrogen Mission - Decarbonising India, Achieving Net-Zero Vision published in March 2022, Ministry of New and Renewable Energy, accessed on 8th August 2023

<sup>13</sup> Knowledge Paper on Alternative Fuels and its Impact on Skill, KPMG and ASDC, accessed on 8th August, 2023



# Impact of the trend:

Alternative fuels will present ICE suppliers with multiple opportunities to expand upon their existing product offerings.

The simultaneous adoption of different energy sources provides OEMs and component manufacturers a variety of options to develop their portfolio. The ecosystem in India is experimenting with multiple product offerings from ICE, EV, ICE hybrids to hydrogen. This is driven by technological innovations, shifting consumer preferences and ongoing assessment of value propositions of different products. Consequently, MSMEs, particularly ICE manufacturers, can take advantage of these offerings and leverage their existing capabilities to offer multiple hybrid offerings. Several stakeholders believe that the future of the automotive industry is

hybrid, alternative and flex fuels. In the long term, consumers may become indifferent to choosing EV or ICE and may prioritise other factors, such as ease of re-fueling, sustainability, driving experience and range. Hence, many OEMs and Tier-1 suppliers are ensuring that their offerings across EV, ICE and hybrid have synergies. Therefore, MSMEs can leverage existing capabilities to make components for ICE and hybrid categories for the short to medium term which should increase their competitiveness and value proposition in the short to medium term and will give them enough leverage to prepare for EV transition in the long term.



# Opportunities emerging due to the trend:

Alternative fuel vehicles are said to offer long term growth potential.

### Biofuels (ethanol and biodiesel)

Some countries have widely adopted biofuels as cleaner alternatives, facilitated by 'flex fuel' engines that can run on biofuels - blend of ethanol and gasoline. This has resulted in significant environmental improvements as evidenced by the reduction of CO2 equivalents in many cities. After achieving 10 per cent ethanol blending, the government now targets

20 per cent blending in petrol by 2025. To boost ethanol production, the government has also implemented measures such as Goods and Services Tax (GST) reduction on ethanol, interest subvention schemes for ethanol production and policy measures for raw material procurement.

### CNG

The Natural Gas Infrastructure Development Plan, launched in 2018, targets to set up 10,000 CNG stations in the country in the next decade.<sup>14</sup> This will expand the existing re-fueling infrastructure and further drive CNG vehicle adoption. This

will increase the opportunity size that ICE MSMEs can cater to with their existing capabilities. Like ethanol, the CNG opportunity demands no additional barriers of R&D or significant upskilling that constrain MSME participation.

### Hydrogen

The use of hydrogen as a fuel for automobiles is still in its nascent stages. The industry may need to exercise patience for opportunities to materialise. Nevertheless, India's

ambitious hydrogen development agenda and increasing interest from several Indian conglomerates may introduce new opportunities, even for the MSMEs.

“ **A rationalised tax structure for flex fuel vehicles coupled with a long-term commitment to biofuels as an important element in the nation's energy basket will incentivise auto OEMs to develop/introduce flex fuel vehicles.** ”

**Shishir Joshipura**  
Managing Director  
Praj Industries Limited



From Left to Right: Pranav Sarpotdar (KPMG in India), Anirudha Totewar (KPMG in India), Shishir Joshipura (MD, Praj Industries Limited), Nikhil Jain (MCCIA)

<sup>14</sup> The Gas Revolution, Fortune India: Business News, Strategy, Finance and Corporate Insight, accessed on 8th August 2023



# Make in India

## Overview

The Make in India trend refers to the collective industrial and policy-driven objective to bolster India's manufacturing capabilities and enable India to become increasingly self-reliant through indigenisation.

Post the Covid-19 pandemic and the global supply chain uncertainties involving China, there is increased focus on developing alternative manufacturing sources. India is well-positioned to meet the regional demand and is being increasingly considered by global multinational companies (MNCs) for setting up manufacturing operations to enable a China+1 option and de-risk their

supply chains. The objective of Make in India includes (a) localisation of products and supply chains for MNCs present in India (b) development of domestic capabilities in product conceptualisation, design, development and manufacturing (c) making India an integral part of global supply chains of global OEMs and auto-component players.



# Impact of the trend:

Off to a promising start, this will provide many opportunities to MSMEs but with certain risks along the way.

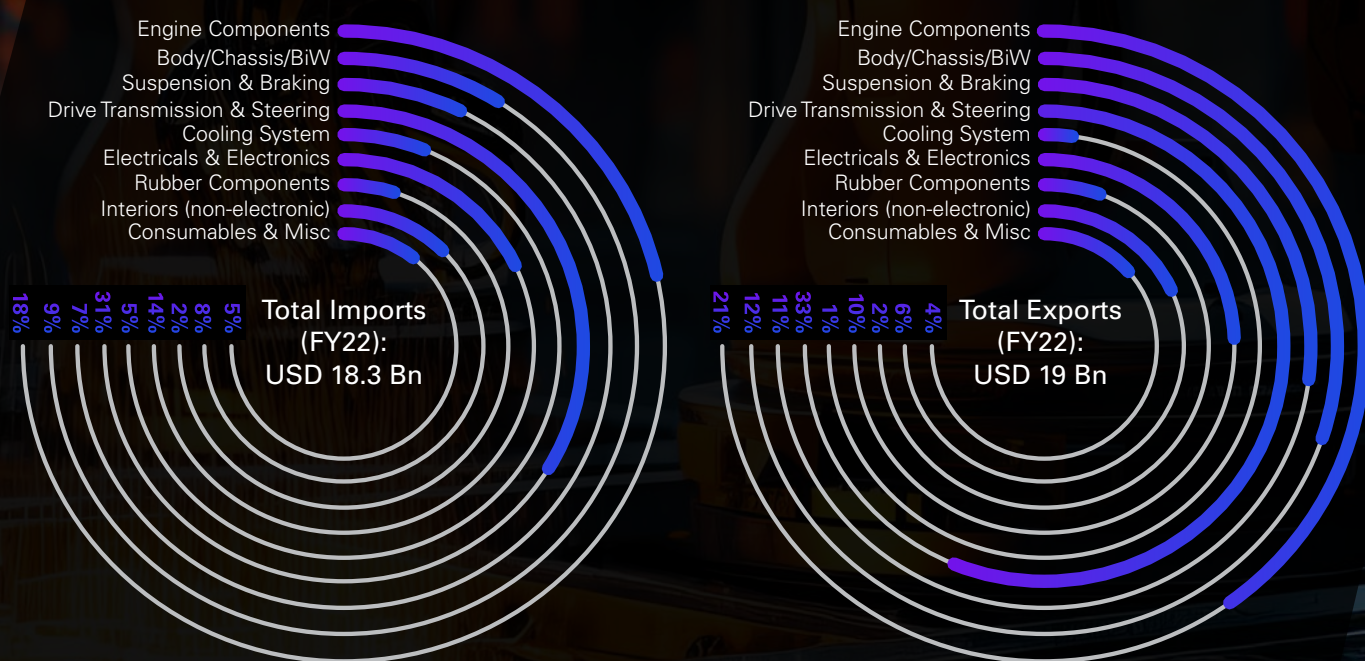




In India, localisation may be more viable in the ICE segment than in the EV segment given the high demand for ICE vehicles allowing for manufacturing at scale. Several companies have undertaken measures to embrace the Make in India initiative. Few OEMs claim to have achieved localisation across different offerings, while some OEMs aim to invest in localisation over time once the capabilities of

suppliers mature. Stakeholders may also continue with their reliance on imports across ICE and EV, as localisation implies higher expenses than imports (refer to Figure 9). MSMEs themselves depend on imports for numerous vital tools, such as controller chips, magnets, charger modules, battery components, emulators and simulators, semiconductors and charging cables.

Figure 9: India's imports and exports by product, FY22 <sup>15</sup>



<sup>15</sup> UNTrademap data, accessed on 8th August 2023



**MSME readiness**

For auto component manufacturers, a rise in the 'Make in India' trend signals more opportunities. MSMEs which have the capabilities to meet a diverse set of requirements from different industry segments may benefit in the long term. Across the ecosystem, respondents concurred that MSMEs

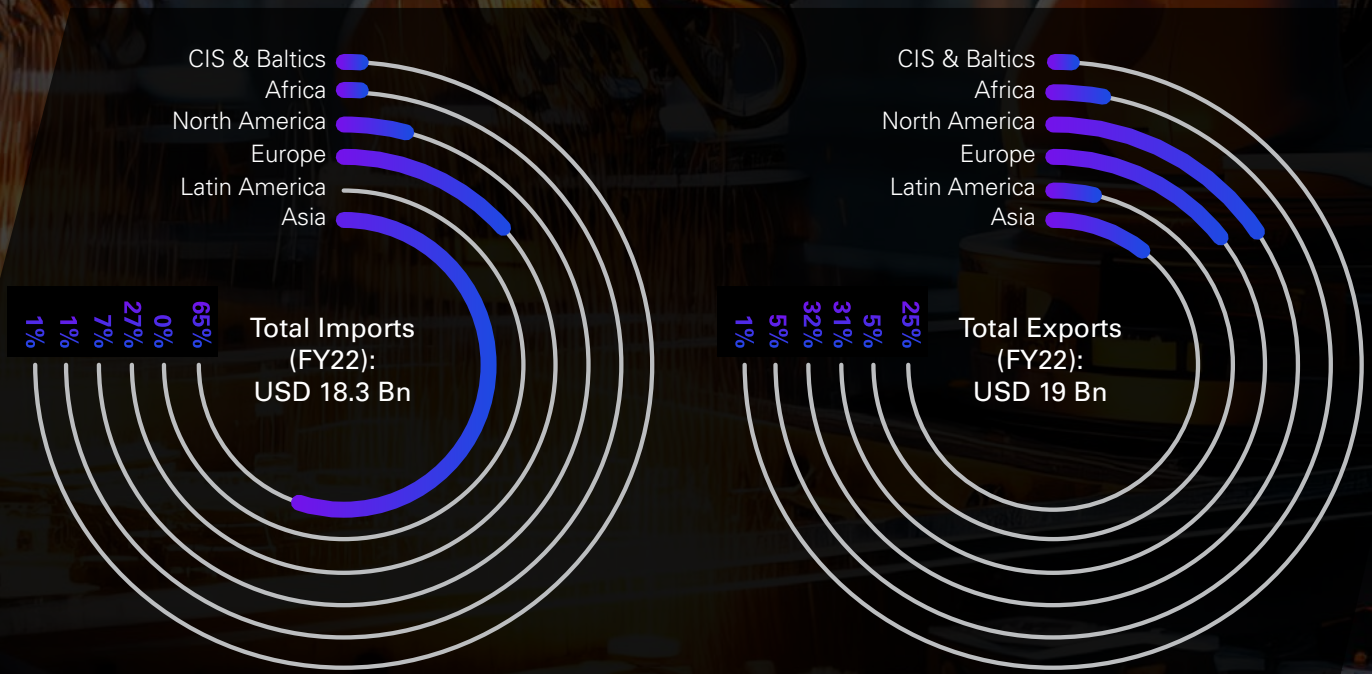
have high potential but only a select few would enhance their skills to the standards demanded by these large OEMs and Tier 1 suppliers. This lag in upskilling or developing capabilities will likely impact the competitiveness of these players and reduced their potential for long-term growth.

**MSME's right to play**

The automotive industry already has robust policy initiatives incentivising localisation and reducing imports. There is a consensus across the automotive ecosystem that the government's Production Linked Incentive (PLI) will achieve its objective of boosting domestic manufacturing. Some believe that the PLI scheme could also increase India's export competitiveness in the global auto components market (see Figure 10). However, some stakeholders are of the view that the high minimum investment threshold for PLI scheme

makes it difficult for MSMEs to compete with established companies. Moreover, for the PLI scheme to help achieve localisation and boost domestic manufacturing, the benefits need to extend to the smaller component suppliers in the ecosystem. Hence, while the policies prompt robust capacity development within the ecosystem, the right to play for MSMEs could be restricted if certain measures/benefits are limited to a small set of large companies.

Figure 10: India's imports and exports by region, FY22 <sup>16</sup>



<sup>16</sup> UNTrademap data, accessed on 8th August 2023



# Opportunities emerging due to the trend:

If MSMEs overcome obstacles and improve readiness, they can avail numerous domestic and export opportunities from localisation.





### Localisation

A few automotive companies are taking steps toward deeper localisation across the value chain. OEMs are gradually increasing their capacity to localise at scale, leading to cost advantages, which incentivises them to localise further. As a result, these MSMEs are experiencing a cascading impact of these initiatives as they are able to tap into more

opportunities in the domestic as well as export markets. As India's position as a global manufacturing hub strengthens, these MSMEs that are continuously on the look-out for growth opportunities and are willing to improve their capabilities, will be better placed to cater to the growing demand.



# Emerging technology

## Overview

Emerging technologies are revolutionising design, development, manufacturing, and marketing practices across the automotive industry.

Driven by evolving operating practices, business models and consumer preferences, the automotive industry is witnessing an adoption of several innovative technologies into day-to-day operations. Technologies

such as alternative materials for light-weighting, 3D printing, Internet of Things (IoT), big data and predictive analytics are leading to development of superior product and service offerings.



# Impact of the trend:

The adoption of emerging technologies is at a nascent stage as companies need to adjust for use cases, consumer experience, etc.





The advent of various innovative technologies, processes and services has significantly impacted the standard operating procedures for automotive companies allowing them to be more agile and adapt to evolve trends. These companies are constantly redrawing their strategies and re-evaluating their offerings to better fit the market needs.

There are certain factors which could slow the pace of adoption of these emerging technologies. For e.g., Consumer acceptance for the Advanced Driver Assistance Systems (ADAS), has been mixed at best. Certain geographical nuances such as road conditions, traffic, adoption of GPS technologies, etc. have rendered some of these technologies

redundant for large scale adoption in developing markets like India. Apart from consumer preferences, some technologies have witnessed low investment whereas some technologies such as IoT have witnessed widespread adoption across the supply chain — from operations management to design. IoT helps monitor product movement throughout the production cycle, reducing wastage and risk of error. As seen in Figure 11, IoT can enhance the efficiency of inventory and supply chain management, resulting in advancements in processes, supply chain optimisation and improved quality of automotive products. Recognising the potential benefits, automotive companies are making investments in IoT, often in collaboration with technology firms.

Figure 11: Applications of IoT in the automotive industry <sup>17</sup>

- 1 **Product innovation through driving pattern analysis** (*acceleration or braking, speeding, terrain*) – Helping automakers develop the vehicle reflecting the customer's needs
- 2 **Product innovation through vehicle health analysis** – Focusing on performance, range
- 3 **Virtual diagnostics, preventive maintenance, and failure analysis** – Focusing on improving reliability of the vehicle
- 4 **Battery management, preventive maintenance system and fault alert system** – Providing battery malfunction reports, maintenance schedule notifications and battery and air pressure alerts resulting in reduced accidents and better customer experience
- 5 **Application based monitoring (for controlling the vehicle remotely via mobile)** – Enabling parental control for geofencing, top speed capping and remote locking
- 6 **AI real-time driving monitoring and energy optimisation** – Offering instant feedback to owners on dashboard and efficiency
- 7 **Firmware updates and unlocking new features** – Enabling vehicle's performance and features (including vehicle application updates, map software updates) to be continuously updated and improved

### Additive manufacturing (3D printing)

In addition to investment, there are certain other emerging technologies that appear to have promising use cases for niche manufacturing requirements but are not yet commercially viable at a large scale. For example, 3D printing can be used for specific use cases, such as prototype development, tool development, etc. However, it is still not a viable option to carry out batch production at scale.

Despite limited areas of application, additive manufacturing has picked up pace in certain applications such as rapid prototyping, printing of custom spare parts and printing of lighter and stronger body parts. It also helps create lighter, safer, and stronger products and plays a significant role in customising products in the manufacturing process.

<sup>17</sup>Technology at the forefront of Electric Vehicles, KPMG and CII (Confederation of Indian Industry), accessed by 31 July 2023



# Challenges faced by MSMEs

## Investment in R&D

MSMEs often ignore investment in R&D which limits their ability to recognise and develop innovative products and technologies. MSMEs often find it challenging to allocate funds specifically for R&D activities due to budget

limitations. In some cases, MSMEs may lack awareness of the benefits that R&D can yield. Given that the outcomes and returns associated with R&D investments are uncertain, R&D is considered as a risk MSMEs are unwilling to take.

## Upskilling

Increasing electrification, adoption of alternative fuels, advent of battery and battery management system will need new skills (see Figure 12 and 13). MSMEs, however, lag in upskilling and often do not have adequate access to training opportunities. Failure to acquire the necessary skills deters MSMEs from working with new products, systems,

processes and equipment associated with emerging technologies and adds a further lag to their growth.

MSMEs need skilling assistance in various domains, ranging from core engineering to new manufacturing technologies, conceptual design, testing, software skills and soft skills.

Figure 12: Expected job roles across the EV value chain<sup>18</sup>

Value chain area	Job roles
<b>Battery manufacturing and recycling</b>	Battery design & testing, wiring harnesses technicians, Thermal management and heat treatment technicians, Chemical Engineers, Chemists, And Materials Scientists, Test Drivers
<b>EV design &amp; assembly</b>	Controls Technicians, Industrial Electricians, Industrial Engineers, Machinists, Mechanical Assemblers, Mechanical Drafting Technicians, Millwrights and Industrial Mechanics, Mold Designers and Toolmakers, Pipefitters, Software Engineers, Electricians, Industrial and Commercial Designers
<b>EV sales and retail</b>	EV Salespeople (with knowledge of automotive software), EV training instructors
<b>EV maintenance</b>	Battery Management Technicians, Automotive Service Technicians and Mechanics, IOT Experts
<b>Charging infrastructure</b>	Electricians, Power-Line Installers/ Repairers, Urban/Regional Planners, Civil Engineers, Re-modelers- for making existing building infrastructure EV-ready

<sup>18</sup> Knowledge Paper on Alternative Fuel and its Impact on the Skill Required, KPMG and ASDC, accessed on 31 July 2023



Figure 13: Expected job roles across the value chain of alternative fuels <sup>19</sup>

Value chain area	Job roles
<b>Production</b>	Boiler Operator, Shredder Operator, Biochar processor
<b>Processing, storage and transportation</b>	Automatic Baler Operator, Technician for conversion to green ammonia, liquid ammonia and fertilisers, Fuel Cell development
<b>Energy conversion and utilisation</b>	Biomass plant operator, Hydrolyser Plant Operator, Micro Grids for power generation, captive power unit operators

### Relationships

MSMEs require mature relationships with OEMs to stay updated about their long-term plans. OEM relationships provide MSMEs with valuable opportunities for growth, access to new products and markets, technological advancements, and enhanced credibility. MSMEs can leverage an OEM's market presence and reputation to reach new customers and expand their market reach effectively. Working with OEMs also allows MSMEs to participate in the initial stages of product

development and be a part of their journey from conceptualisation to launch to after-sales service. MSMEs in return can contribute with their expertise, innovation, and customised solutions, which can result in the co-creation of high-quality products. With the increasing popularity of EVs and to combat impact of other trends, OEMs are seeking new collaborations with suppliers who demonstrate a certain level of preparedness and maturity.

### Partnerships for technological support

MSMEs need to establish partnerships with technology providers who can assist them during this transition. Partnerships enable MSMEs to upgrade their production processes, improve product quality and increase operational efficiency. However, very few MSMEs have

successfully engaged with technology partners. This may result in a competitive disadvantage as compared to other companies that have embraced such partnerships and hence are at pace with technological advancements.

### Ease of doing business

India currently ranks at 63<sup>rd</sup> position in the World Bank's Ease of Doing Business ranking and has made considerable progress in the last decade.<sup>20</sup> However respondents opine that further improvements in statutory approvals, regulatory processes and policies are still

possible to make India competitive with other preferred locations such as Vietnam and Indonesia. For MSMEs, issues with ease of doing business could restrict their growth potential and compel the ecosystem to depend on imports.

### Infrastructure

For certain trends, such as EVs, MSMEs lack infrastructure support such as R&D for design and product development, prototyping and testing facilities. In certain areas, MSMEs find it harder to compete with established companies or companies

backed by a strong global MNC which have access to these services. While the stakeholders acknowledge the ambitious vision for EV, more emphasis is needed on facilitating implementation and execution of these plans.



**Small and medium businesses in the automotive component supply ecosystem face three key challenges. Firstly, they lack active mentoring and support from the ecosystem. Secondly, the second and third generations of legacy MSME businesses are less inclined to enter the business. Lastly, these businesses are not used to actively investing in developing capabilities and rely on OEMs/Tier 1s to drive their future plans.**



**Aditya Bhartia**  
Managing Director  
Advik Hi-Tech Pvt Ltd

<sup>19</sup> Knowledge Paper on Alternative Fuel and its Impact on the Skill Required, KPMG and ASDC, accessed on 31 July 2023

<sup>20</sup> Ease of Doing Business rankings, World Bank, accessed on 8th August 2023



# ECOSYSTEM SUPPORT REQUIRED

## Knowledge exchange

MSMEs refrain from investing in upskilling and capability development primarily due to their limited comprehension of market forces and formidable challenges posed by scarcity of readily available information. Stakeholders stress the importance of providing MSMEs with access to macro and micro-level information to ensure readiness. It is

imperative to disseminate information and facilitate knowledge exchange between companies in the ecosystem and MSMEs. Ensuring timely knowledge exchange will be pivotal to help enable MSMEs to invest in R&D, product development, technology upgrades and upskilling to remain competitive.

## Networking opportunities

To foster affiliations with OEMs and technology partners, MSMEs need opportunities where they can seek international partnerships and build their network. Networking opportunities will help MSMEs gain broad-level information on global

trends as well as information on plans and objectives of global OEMs. Additionally, these opportunities can help MSMEs showcase their skills, capabilities and value proposition to prospective collaborators.

## Access to capital and developmental infrastructure

Some challenges, such as R&D and the digitisation of supply chains, are harder to tackle for MSMEs due to lack of access to capital. R&D, for instance, is both necessary for growth and highly risky with an indeterminate time frame on returns. Similarly, upskilling and recruiting highly skilled tech talent requires competitive compensation and ongoing training programmes, which MSMEs may not be able to offer. Hence, MSMEs require a combination of capital guidance, infrastructure support, access to stakeholders, knowledge sharing events, and government support.

model, like the auto cluster set up by MCCIA. A dedicated shared services facility especially for EV across the 2W, 3W, 4W and associated automotive components could address multiple challenges from high capital deployment, access to skilled workforce and access to state-of-the-art R&D and testing facilities. This facility can offer end-to-end support and guidance to MSMEs, from incubation to providing technical manpower, prototyping, providing production services for small batch scale. This facility will enhance the national and global competitiveness of Pune-based MSMEs, particularly at a time when the ecosystem is making a perfect recipe for success of the automotive industry.

A possible solution to address these challenges could be in the form of a shared service

## Policy support

Government and industry associations have been instrumental in encouraging capacity and capability development of the MSMEs. However, MSMEs need further support from government and industry associations in several domains such as skill development, incentives for localisation, financial incentives

for integrating technology into manufacturing, policy measures for infrastructure development and, finally, export promotion. Support from policy makers in these areas will empower MSMEs to overcome multiple challenges, invest in readiness and contribute to India's vision of becoming a global automotive hub.



## The need of auto cluster 2.0 and Ramp-up factory for auto component players

Mahratta Chamber of Commerce, Industries and Agriculture (MCCIA – Pune) would like to propose setting up of a Ramp Up Factory (RUF) for future mobility segments (two wheelers, three wheelers, agriculture equipment and components of these segments), industrial electronics, medical equipment, and other areas. Subsequently, this facility can lead to a full scale advanced future technology centre.

The Ramp Up Factory (RUF), will aim to address the concerns of the automotive cluster 2.0 including providing assistance in issues like investment in plant, machinery and buildings, particularly for

the early-stage companies in the EV segment. It will also aim to provide support in terms of incubation, access to government schemes, technical manpower, small batch production facility and to facilitate technologies to reach the market.

The proposed RUF in Pune, is of vital importance to give a leg up to India to march ahead in the global EV ecosystem, particularly at a time when the focus on research and development, design and prototyping, sourcing, component production, availability of workforce (engineering and other) etc. are making the country a perfect destination for businesses.

**Indian component manufacturers need not rely extensively on OEMs to take initiative and need to aggressively venture out to find partners as soon as possible for development towards the transition. They should look at the exports market, especially the countries with matured EV industry.**

**Ranjit Date,**  
Managing Director  
Wipro PARI Private Limited





# KPMG in India contacts:

## **Akhilesh Tuteja**

Head - Clients and Markets  
P: +91 98710 25500  
E: [atuteja@kpmg.com](mailto:atuteja@kpmg.com)

## **Juzer Miyajiwala**

Office Managing Partner - Pune  
P: +91 99704 22349  
E: [juzerm@kpmg.com](mailto:juzerm@kpmg.com)

## **Avi Ranade**

Partner - Transformation-C&O-IM&A  
P: +91 99232 03494  
E: [aranade@kpmg.com](mailto:aranade@kpmg.com)

## **Jeffry Jacob**

Partner and National Sector Leader - Automotive  
P: +91 88793 87635  
E: [jeffry@kpmg.com](mailto:jeffry@kpmg.com)

## **Rohan Rao**

Partner - M&A Consulting  
P: +91 98212 82975  
E: [rohanrao@kpmg.com](mailto:rohanrao@kpmg.com)

## **Saurabh Ranadive**

Director - M&A Consulting  
P: +91 99309 14433  
E: [sranadive@kpmg.com](mailto:sranadive@kpmg.com)

[kpmg.com/in](https://kpmg.com/in)

Follow us on:  
[kpmg.com/in/socialmedia](https://kpmg.com/in/socialmedia)



The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

KPMG Assurance and Consulting Services LLP, Lodha Excelus, Apollo Mills Compound, NM Joshi Marg, Mahalaxmi, Mumbai - 400 011  
Phone: +91 22 3989 6000, Fax: +91 22 3983 6000.

© 2024 KPMG Assurance and Consulting Services LLP, an Indian Limited Liability Partnership and a member firm of the KPMG global organization of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee. All rights reserved.

The KPMG name and logo are trademarks used under license by the independent member firms of the KPMG global organization.

The views and opinions expressed herein are those of the quoted third parties and do not necessarily represent the views and opinions of KPMG in India.

This document is meant for e-communication only. (005\_THL0224\_AB)