Background paper

Towards eMobility: Putting the consumer at the wheel

July 2019

pwc

ASSOCHAM INDIA


EVBOX

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Message from ASSOCHAM

Balkrishan Goenka
President
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The world is witnessing challenges arising from climate change, CO_2 emissions, dependence on fossil fuels and the need to improve quality of life. In response, various countries have taken innovative measures to harness natural and renewable resources and are exploring alternate technologies to address these challenges. A number of solutions have been found and are at different stages of development and market access. In the area of e-mobility, the automobile industry is at the cusp of a paradigm shift from internal combustion vehicles to 'green' mobility solutions, including e-vehicles.

India is also actively seeking innovative, cost effective and viable solutions to address its imminent environmental concerns in general and the poor air quality in particular. India's present position is pivotal wherefrom it can bring about a transformation in its infrastructure, cut its energy demand and carbon emissions and fulfil its renewable energy goals. The setting up of an e-vehicle ecosystem if coupled with the development of new and smart cities across the country, would address the dual challenges of connectivity and urban transportation. No doubt, enormous impetus is required, but the task has begun.

The government envisions becoming an e-vehicle country by 2030. This has catalysed further market interest and opportunities. The transition to e-vehicles is necessary for the Indian automotive industry to maintain its foothold and gain additional ground as the world shifts towards e-vehicles. The government's policy FAME (Faster Adoption and Manufacture of (Hybrid and) Electric Vehicles) incentivises e-vehicle production and creation of electric mobility transportation, with focus on technology development, demand creation, pilot projects and charging infrastructure. This would facilitate the creation of an ecosystem synergizing energy players, entrepreneurs and tech companies. It is hoped this would enhance availability of e-vehicles, accessibility of charging infrastructure and provide economic incentives to bridge the cost gap between internal combustion engines and e-vehicles.

ASSOCHAM has prepared a study on the subject with the objective of outlining factors which would provide impetus to e-mobility sector for achieving the outlined target. We hope that the deliberations at the Summit will help in creating the roadmap for future growth and development for the Electric Mobility sector in India.

I hope this paper would be useful to policy makers, people engaged in business and academia and help in fostering informed debate.

Thank you.

Balkrishan Goenka

Preface

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PwC India

Electric mobility supported by renewable energy sources and transportation using alternative fuel is likely to play a significant role in addressing the current environmental challenges. Adoption of electric vehicles (EV) will not only lead to a healthier environment but will also provide low cost mobility options for public and private transportation.

Accelerating the adoption of electric mobility in India is an ongoing debate, the solution to which is not simple. There is no doubt that transitive solutions have to be designed and implemented in phases, and will always be incremental in nature.

An important element to consider while devising such a solution is consumer/ end-user mindset. Sustainable efforts are required to reduce consumer anxieties and increase the user acceptance of EVs. For example, consumers are concerned about running out of charge while driving. Improving charging infrastructure and/or improving driving range of vehicle could alleviate such a concern.

The point to consider is: how do we ensure better returns in terms of consumer acceptance? Also, it is often important to inform consumers about their 'needs' and differentiate those from what they 'want'. In view of that, impactful communication is yet another key aspect that could help drive home the correct message to consumers, highlighting the benefits of electric mobility and, in the process, create enhanced traction.

The need of the hour is for all relevant stakeholders in the EV ecosystem to come together and work collaboratively in this direction. I would like to offer my best wishes for the summit and am confident that our observations in this report would provide an essential starting point to make the consumer central to the theme of eMobility.

01 Electric vehicle market in India

An overview

The Indian automotive industry has grown at a compound annual growth rate (CAGR) of 8.6% over the last four years.[1] Key drivers favouring the growth of the Indian automotive market are rapid urbanisation (31% as per Census 2011), increasing disposable income (7th Pay Commission), large millennial population, increasing highway and infrastructure investments, and healthy rural demand growth.

OEM- Domestic sales and exports

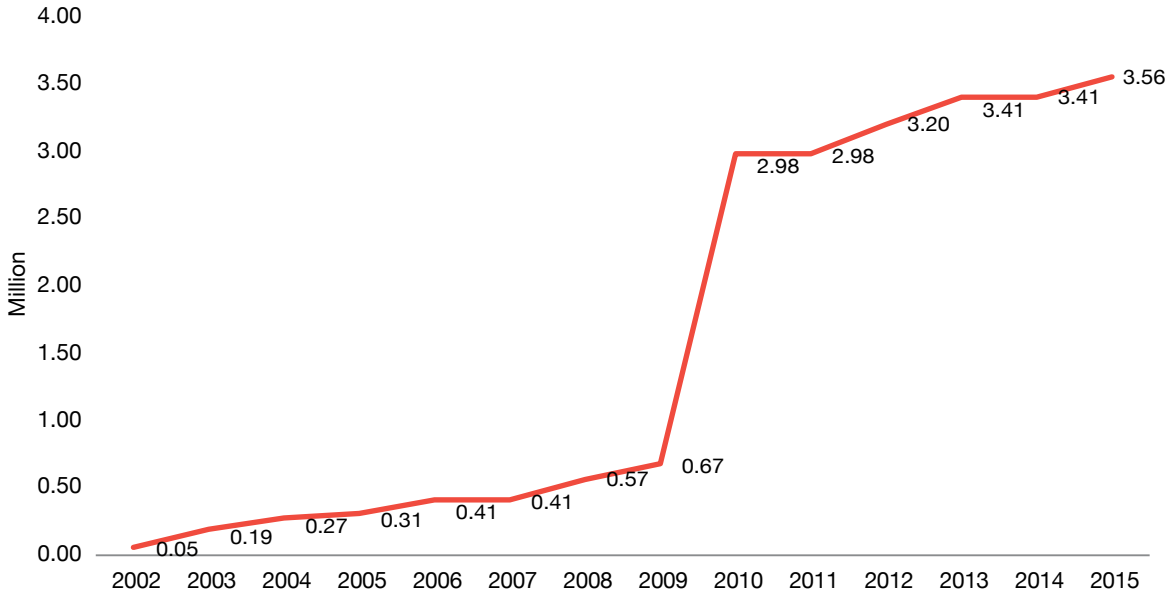
Source: SIAM

The Indian EV market has also seen growth through government regulations and investment outlays, especially in the areas of affordability and charging infrastructure. Electric vehicle (EV) sales in India have reached 0.759 million in FY 2019.[2] The Ministry of Road Transport and Highways' (MoRTH) focus on reduction of pollution levels on the road through the mandate of scrapping older polluting commercial vehicles provides further impetus to the mission of enhancing the share of EVs.

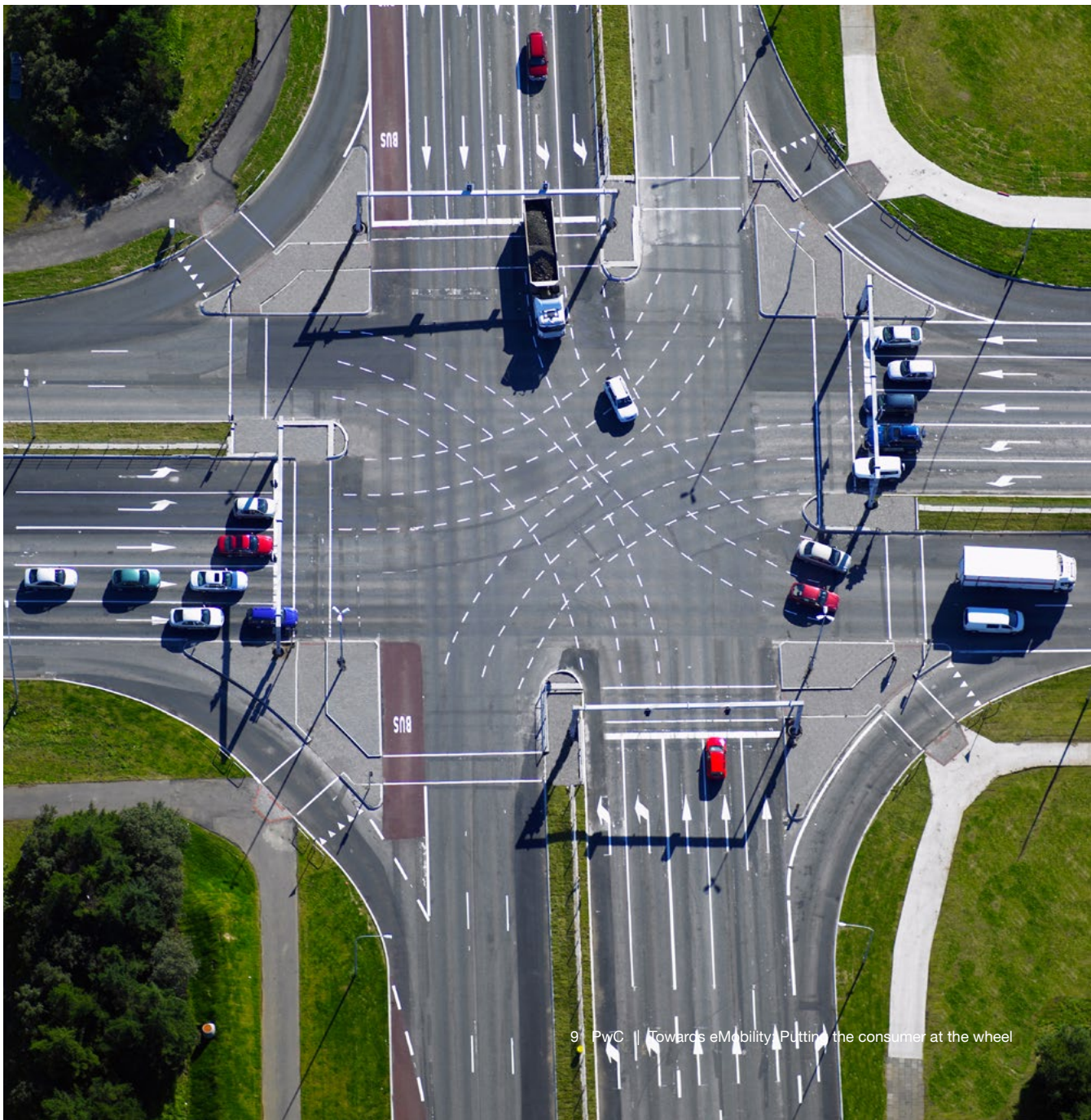
Light commercial vehicles (LCVs), which constitute 4% of the overall vehicle stock, account for 65–70% of the vehicular pollution of the country. From 2002 to 2015, 3.56 million taxis have been added to the LCV fleet in India. Older vehicles, particularly those registered before 2000 or in the early 2000s, have low fuel efficiency and higher C02 emissions. They can be replaced with 'greener' EVs, providing further scope for the use of EVs in India.[3]

1 Source: SIAM, PwC analysis
2 Wadhwa, N. (1 May 2019). EV sales in India cross 7.5 lakh mark in FY2019. Autocar. Retrieved from https://www.autocarindia.com/car-news/ev-sales-in-india-cross-75-lakh-mark-in-fy2019-412542
3 Source: SIAM, MoRTH scrapping policy

New registrations of taxis



(Source: Motor Vehicles – Statistical Year Book India 2017)



Following are the key factors shaping the development of the EV market in India

Interplay of five key factors will determine how the Indian electric vehicle market evolves

Key drivers

01 Environmental concerns

- Rise in crude oil prices
- Reduction in fossil fuels
- Increasing ICE pollution in the transportation sector
- Long-term sustainability
- Reduction in solar tariff
- Stringent fuel efficiency norms (CAFÉ)
- Implementation plan for BS-VI

02 Government support

- Creation of EV demand in the market
- Promoting indigenous manufacturing of EV
- EV market segment prioritisation based on ease of adoption and impact on the environment
- Driving the ecosystem to achieve government's multiple objective
- Increasing EV customer awareness

03 Charging infrastructure

- Developing charging infrastructure though investments from Government and private players
- Establishment of charging guidelines and standards
- Integration of grid with charging stations to provide seamless service
- Charging convenience to reduce customer anxiety

04 Supply chain and distribution

- Raw material availability for making EV components
- Opportunity identification for EV component manufacturing in India
- Building of local e-components manufacturing capability
- Dealer's motivation in pushing the EV product to the customer

05 Customer acceptance

- Economic rationale behind purchasing EVs
- Lack of customer awareness
- Vehicle performance and features
- Battery performance
- Range anxiety

Policy advancements for electric mobility in India

The timelines for various national-level developments have been shown below. A few Indian states have also established their own EV policy and regulatory frameworks, in line with national developments.

National Mission on Electric Mobility

Aimed to provide Government support on all matters related to EV and create synergistic methods for long-term commitment and ownership among the stakeholders involved in the programme.

FAME I

Launched by DHI to increase the focus on manufacturing of electric and hybrid vehicles. Allocated budget was INR 895 crore, with the scheme running from April '15 to March '19.

Telangana Electric Vehicle Policy

Establish Telangana as the benchmark state in India and a showcase model of international standards for EV adoption across segments, supported by a world-class infrastructure and ecosystem.

Charging Infrastructure for Electric Vehicle – Guidelines and Standards

Launched by the Ministry of Power, the scheme mandates the setting up of at least one public charging station in a grid of 3 km X 3 km. Furthermore, one charging station needs to be set up every 25 km on both sides of the highways/roads.

Uttar Pradesh Electric Vehicles Manufacturing Policy

Establish Uttar Pradesh as the preferred destination for attracting investments in the manufacturing of EVs, create employment opportunities from supply and demand sides, create a conducive environment for use of EVs, and develop human capital to meet the needs of the industry.

FAME II

Launched by DHI, this scheme is an extension of the FAME I scheme with increased allocation of funds over a period of 3 years. INR 10,000 crore has been allocated for this scheme.

Delhi Electric Vehicle Policy

Bring about a material improvement in Delhi's air quality by bringing down emissions from the transport sector, and support the creation of jobs in driving, selling, financing, servicing and charging of EVs.

Andhra Pradesh Electric Mobility Policy 2018-23

Support every aspect of electric mobility and accelerate adoption of EVs, eventually leading to a healthier climate.

Karnataka Electric Vehicle and Electric Storage Policy

To make Karnataka a preferred investment destination for manufacturing of EVs by leveraging opportunities and advantages available for sustainable development and promote a conducive manufacturing ecosystem and develop human capital to meet the needs of the industry.

National Electric Mobility Mission Plan 2020

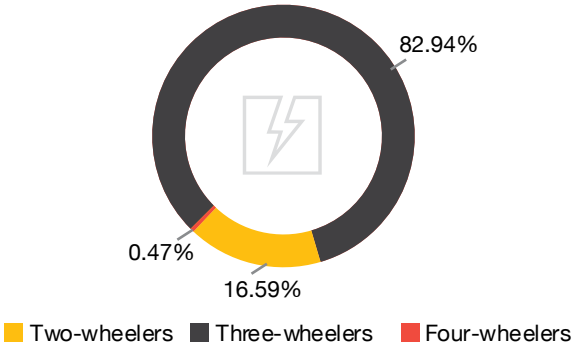
Launched by DHI, the plan targeted 6–7 million units of new vehicle sales of EVs.

Source: Government of India; Government of Karnataka, Government of Telangana, Government of Delhi, Government of Andhra Pradesh, Government of Uttar Pradesh

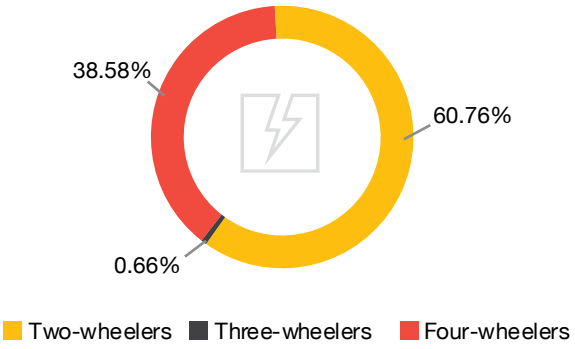
Impact of FAME I

Phase I of the Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME) scheme was launched in 2015 to promote the manufacturing of EVs and improve the viability of EVs from a consumer perspective. The scheme has been successful, with sales of EVs having crossed approximately **7.5 lakh in FY 2019**. While the majority of sales in the EV segment have been in the three-wheeler category, the demand for incentives under the FAME I scheme has been primarily from two-wheeler (61%) and four-wheeler categories (38%).

Percentage share of electric vehicles sold in FY 2019

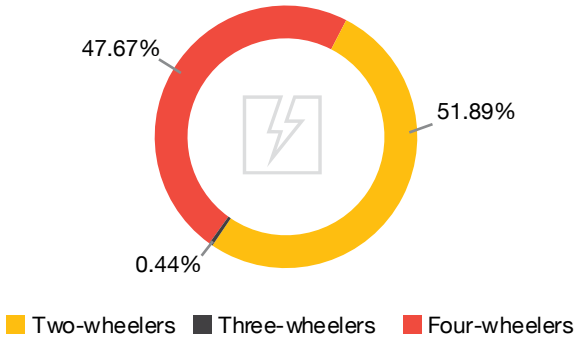


Percentage share of electric vehicles sold under the Fame I Scheme

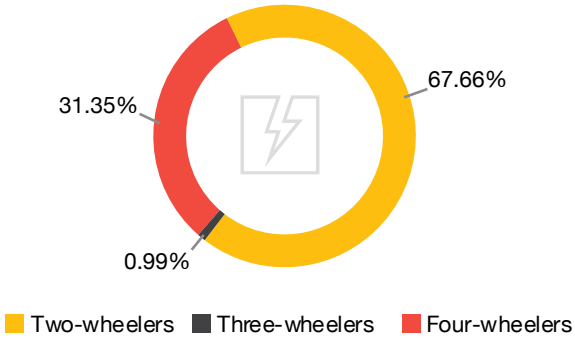


Regional insights under the **FAME I scheme indicate that the FAME I benefit absorption of each vehicle segment varies considerably across regions, providing opportunities to develop vehicle-specific and region-specific strategies.**

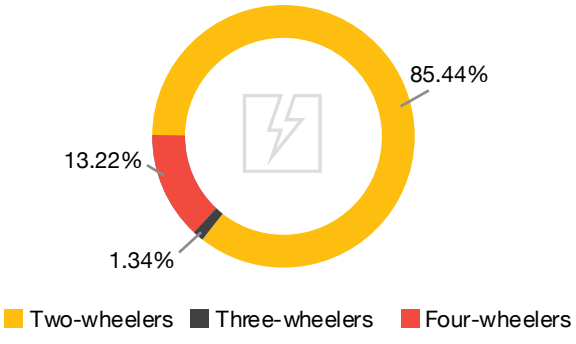
Percentage share of vehicles sold under the Fame I Scheme in South India



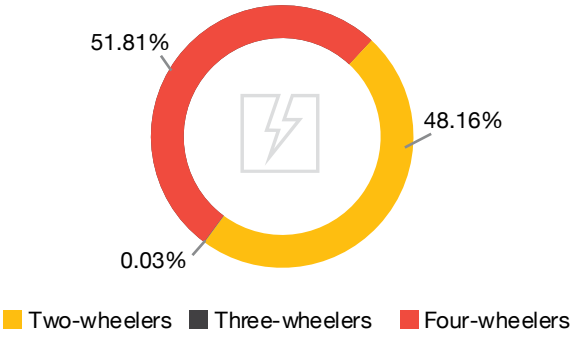
Percentage share of vehicles sold under the Fame I Scheme in North India



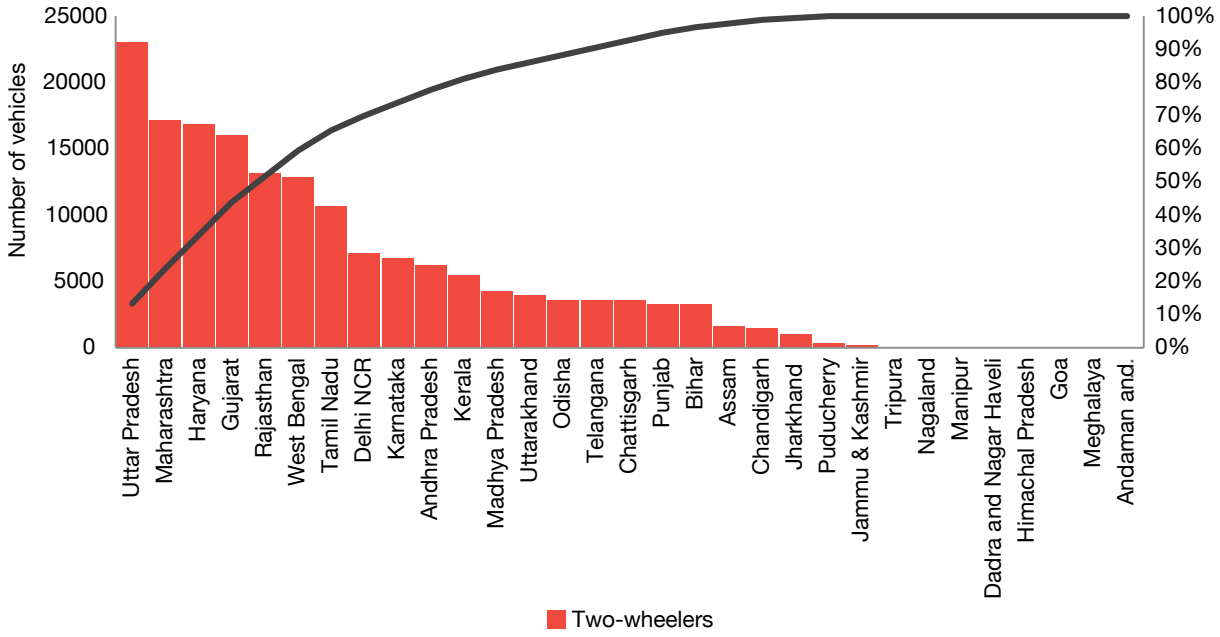
Percentage share of vehicles sold under the Fame I Scheme in East India



Percentage share of vehicles sold under the Fame I scheme in West India

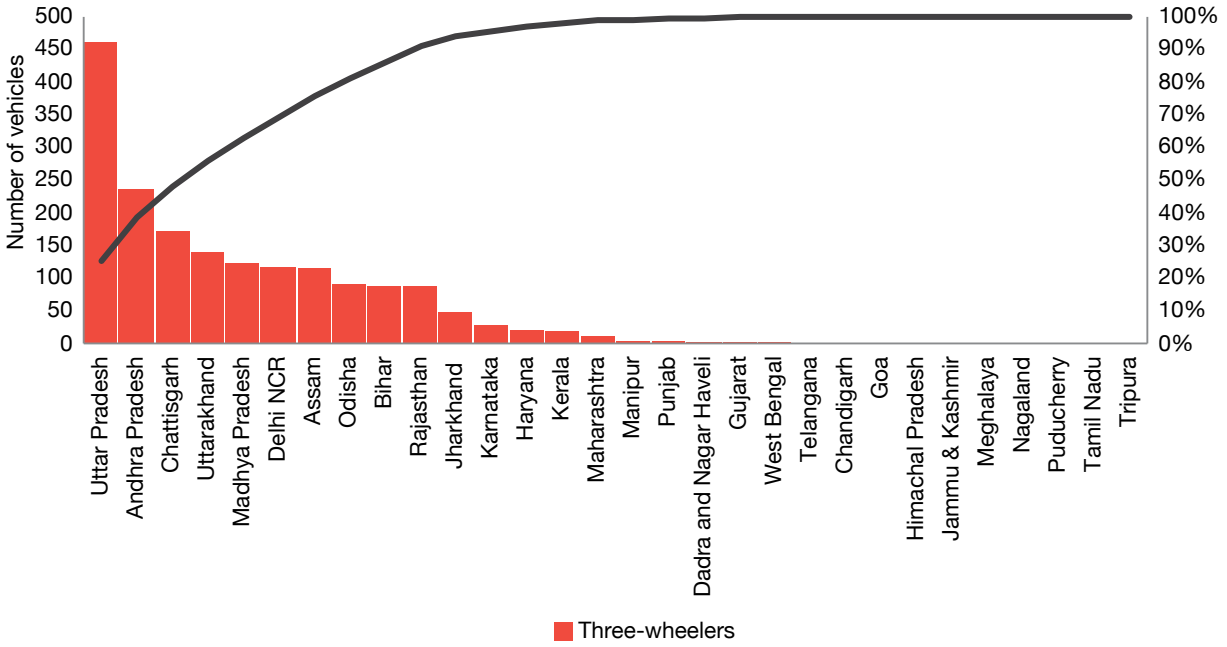


Top contributors to two-wheeler sales under the FAME I scheme



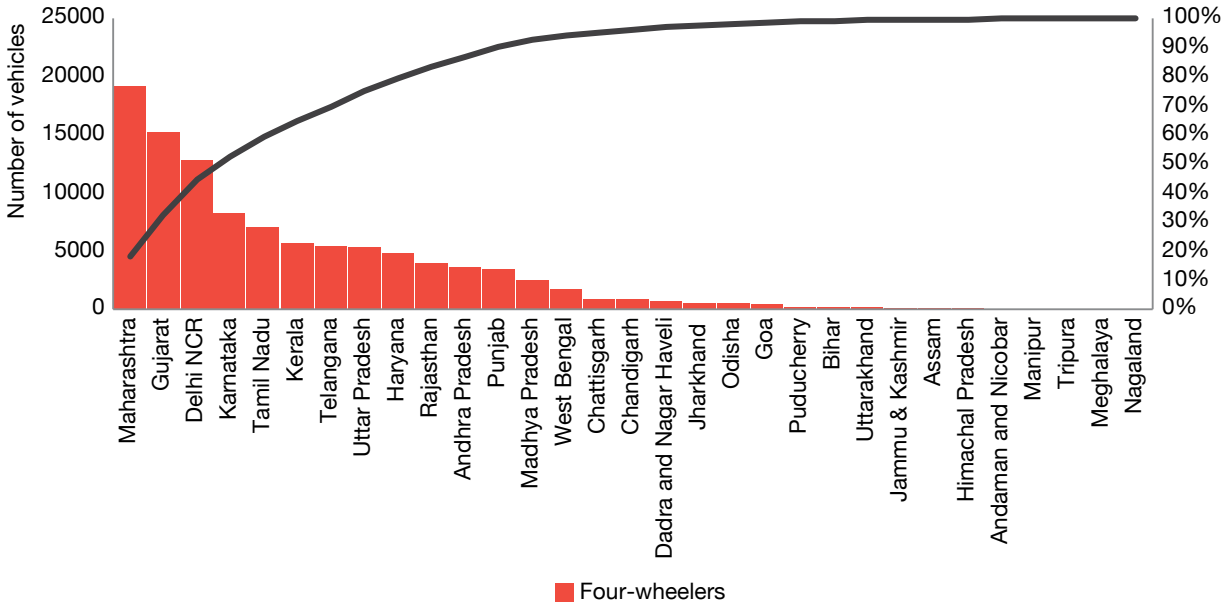
States which have contributed 80% of the sales of two-wheelers under the FAME I scheme are **Uttar Pradesh, Maharashtra, Haryana, Gujarat, Rajasthan, West Bengal, Delhi NCR, Karnataka, Andhra Pradesh and Kerala.**

Top contributors to three-wheeler sales under the FAME I scheme



States which have contributed 80% of the sales of three-wheelers under the FAME I scheme are **Uttar Pradesh, Andhra Pradesh, Chhattisgarh, Uttarakhand, Madhya Pradesh, Delhi NCR, Assam and Odisha**.

Top contributors to four-wheeler sales under the FAME I scheme



States which have contributed 80% of the sales of four-wheelers under the FAME I scheme are **Maharashtra, Gujarat, Delhi NCR, Karnataka, Tamil Nadu, Kerala, Telangana, Uttar Pradesh and Haryana.**

Models available under the FAME I scheme

Following are the noteworthy Original Equipment Manufacturers (OEMs) whose variants have been registered under FAME I scheme

Total number of OEMs registered under the FAME I scheme

7 Four-wheeler	4 Three-wheeler	18 Two-wheeler

Analysing the direct and indirect benefits from FAME II

FAME II is likely to be a game changer for the EV ecosystem in India owing not only to direct demand incentives to the **15,62,090 EVs** that will be supported under the scheme, but also because of the boost it provides to the manufacturing of batteries and other components that will be required for the complete assembly of EVs.

Direct incentives to the tune of INR 8,596 crore have been allocated for buses (EV technology), four-wheelers (EV, plug-in hybrid and strong hybrid), three-wheelers (including registered e-rickshaws), and two-wheeler EVs. Apart from demand incentives, INR 1000 Crore and INR 38 Crore have been sanctioned for the development of charging infrastructure and administrative expenditure respectively under the FAME II scheme.

Additionally, the Government of India has announced tax rebates up to INR 1.5 lakh on interest paid on EV loans. Consumers will get a total tax exemption benefit of INR 2.5 lakh over the entire loan period. Further, exemption of custom duty has been sanctioned on lithium ion cells, which would help reduce the cost of lithium ion batteries.[4]

01	Manufacturing of **15,62, 090 EVs with a market size of USD 3.87 billion**	
02	Requirement of **6.82 million kWh batteries, market size of USD 1.32 billion**	
03	Requirement of other EV components such as **charger and throttle, controller and brushless DC motor**	

Figure: FAME II to directly impact EV ecosystem worth approximately USD 4 billion in the next 3 years

Source: NITI Aayog, PwC analysis

4 Ghosh, Malyaban. (8 July 2019). India looks to lead electric vehicle race with latest push in budget. Livemint. Retrieved from https://www.livemint.com/budget/news/india-looks-to-lead-electric-vehicle-race-with-latest-push-in-budget-1562523548797.html

Public transportation benefits from the FAME II scheme

Procurement of e-buses under the FAME II scheme

The Department of Heavy Industries (DHI), Government of India, has called for procurement of **5,000 electric buses in June 2019** under the FAME II scheme. These electric buses will be allotted to 40 cities, which will be selected on the basis of any one of the following criteria:

- Population of over 1 million as per the 2011 census
- Notification as a smart city by the Ministry of Housing and Urban Affairs (MoHUA)
- Connectivity to seven major metros (Delhi, Mumbai, Kolkata, Chennai, Hyderabad, Bengaluru and Ahmedabad)
- Major city under the special category states/UTs
- Capital cities of all states/UTs that are not covered under the above categories
- Intercity bus operations connecting these cities

Key issues pertaining to use of EVs in India

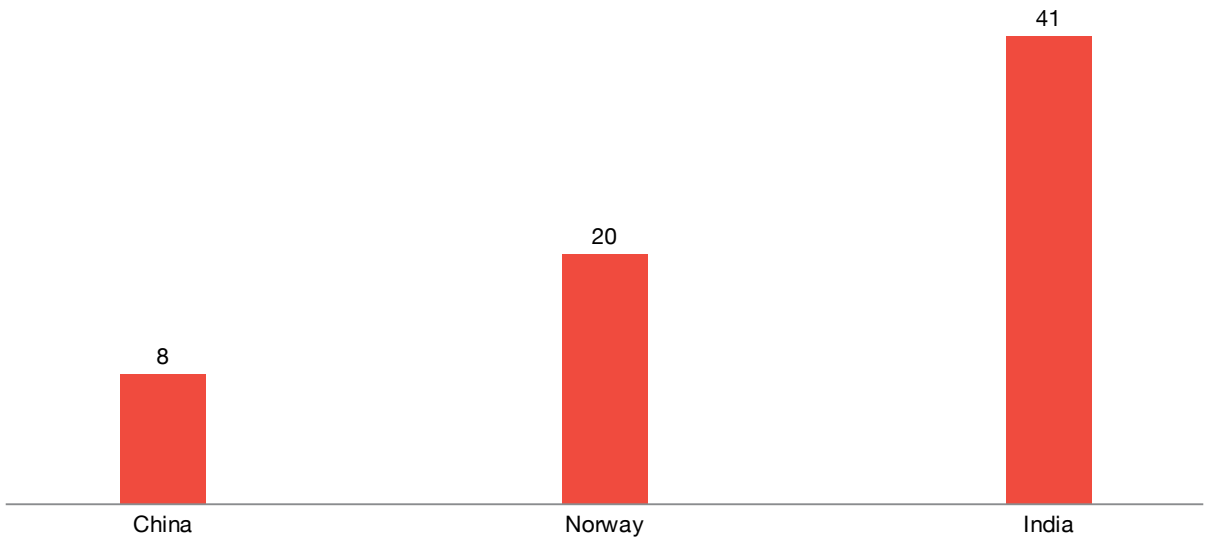
The perceived issues in the electric vehicle (EV) segment may be classified into three categories.

- **Charging infrastructure and driving range**

  To be able to provide a seamless driving experience, two levers are available: (a) improving access to charging infra and (b) improving the driving range of vehicles.

  Expenditure on charging infrastructure, standardisation and expenditure/grants on R&D to improve driving range and safety features will help in building consumer trust. For example, in China, the average ratio of public charging points to EVs is 1:8; and the corresponding ratio is 1:20 for Norway and 1:41 for India (see figure below). Considering the expected increase in the sales of EVs, the development of charging infrastructure becomes very important for the development of a suitable ecosystem. Further, in terms of driving range, very few variants available in the market go beyond 150 km/charge. Building the right financial model for private sector investment in charging infrastructure will be one of the key success factors for EV adoption in the country.

Ratio of Electric vehicles to a charging point



Source: Global EV Outlook 2019, the Norwegian Charging Station Database for Electromobility, PluginIndia

- **High battery prices of EVs**

  Battery prices are one of the main factors impacting the cost of EVs. However, the price of these vehicles is expected to come down by 5–6 percentage points every year in the upcoming two-to-three-year period, thus reducing the gap between the cost of internal combustion engines (ICEs) and EVs.

- **Customer acceptance**

  Multiple factors such as resale price of an EV, replacement of batteries in ownership cycles, availability of charging points, and repair of EVs in case of a breakdown will have to be addressed by OEMs in order to drive mass adoption of electric mobility by consumers. This will require joint effort from the Government and industry.

02 The consumer context

The survey conducted for this study to understand consumer behaviour is a dip-stick study based on a limited sample size.[5] Detailed research would be required to observe differences across various price segments of passenger vehicles. The responses also vary across geographies and type of customer segments.

Growth in times of contraction

Although passenger vehicles and commercial vehicles constitute 13% and 4% respectively of the domestic market share (FY19), the passenger vehicle market witnessed a CAGR of 6.98% in the sales of vehicles.[6] In FY20 Q1, however, the results have not been very encouraging. Passenger vehicle sales dipped by 18.42% as compared to FY19 Q1. Consumer sentiments, rural demand and increasing costs appeared to be the key reasons for the contraction, as indicated by SIAM.

Amidst the contraction, the automobile ecosystem is juggling with another much-required push – the EV segment. The segment saw rapid growth between FY18 and FY19, primarily driven by three-wheelers. The four-wheeler segment saw tripling of sales, partly masked by lower base sales figures, from about 1,200 units in FY 18 to about 3,600 in FY19. However, there have been concerns about the sustainability of the EV sales numbers in FY20, with the industry seeking changes in the FAME II scheme.[7]

Driving demand for EVs

FAME, GST rate cuts and, indirectly, through an increase in petrol and diesel prices. However, will such price incentives alone be enough to drive demand? To answer this question, we will need to understand how consumers make decisions; and how this understanding can drive better initiatives both at the Government and industry levels.

In this report we attempt to provide a basic understanding of the consumer mindset and suggest possible future directions. Given that EV adoption is already being pushed in the commercial and public transport segments and the economic benefits of EVs over ICEs based on vehicle-km travelled per day, our survey focused on the four-wheeler passenger vehicle segment in order to understand how voluntary adoption in this private segment may be improved.

Understanding consumer preference

Buying a passenger vehicle is a time-consuming process, with various internal and external factors influencing the consumer. In India, this decision-making process remains particularly complex and consumers face information overload. For example, in FY16, approvals were accorded by the Government to about 60 models comprising about 210 new variants of passenger vehicles (four–eight seaters in the four-wheeler category) from about 16 brands. A simple search on 'new car' research websites for vehicles in the price range of INR 10–15 lakhs shows about 40 models with over 160+ variants.

The decision-making process is further complicated by offers, differential mileage, features and price differentials. For EVs, the model share in this space is only about two models, which is roughly about 5%. Within the INR 1–15 lakh segment, the model share of EVs reduces even further, with about three models with 140+ variants available, or roughly about 2%. Although simply increasing the number of models and variants alone may not help boost EV sales, it is certainly one of the factors influencing demand.

5 Our survey (conducted from 6–10 July 2019) involved 214 respondents, of which n=106 responses were taken into consideration based on completeness and time spent. The survey respondents belong to about 15 states in India and are primarily educated urban consumers. Further, 98% of the respondents are <=45 years. About 28% of the respondents are prospective first-time buyers, whereas 72% of the respondents already own a passenger vehicle and are potential second-time buyers. The survey design was such that additional information was provided to respondents over five stages, with the aim of influencing their choices and comparing the stated and inferred preferences.

6 Source: SIAM

7 Source: SIAM and Wadhwa, N. (1 May 2019). EV sales in India cross 7.5 lakh mark in FY2019. Autocar. Retrieved from https://www.autocarindia.com/car-news/ev-sales-in-india-cross-75-lakh-mark-in-fy2019-412542

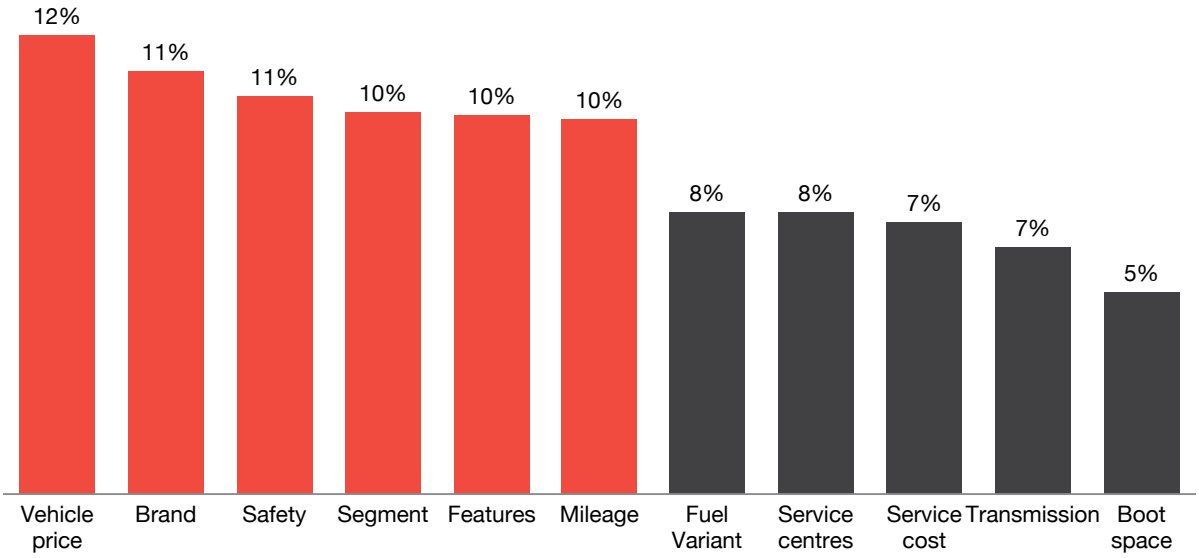
03

Through the consumer lens

Consumers are flexible when provided with compelling reasons, market price sensitivity notwithstanding

The survey respondents chose vehicle price as the most important consideration at the time of buying a passenger vehicle. Brand, safety, segment (sedan, hatchback, etc.), features and mileage were other important considerations. Given the low difference in weighted sum response (see chart below), it may be inferred that the order of these priorities is dynamic.

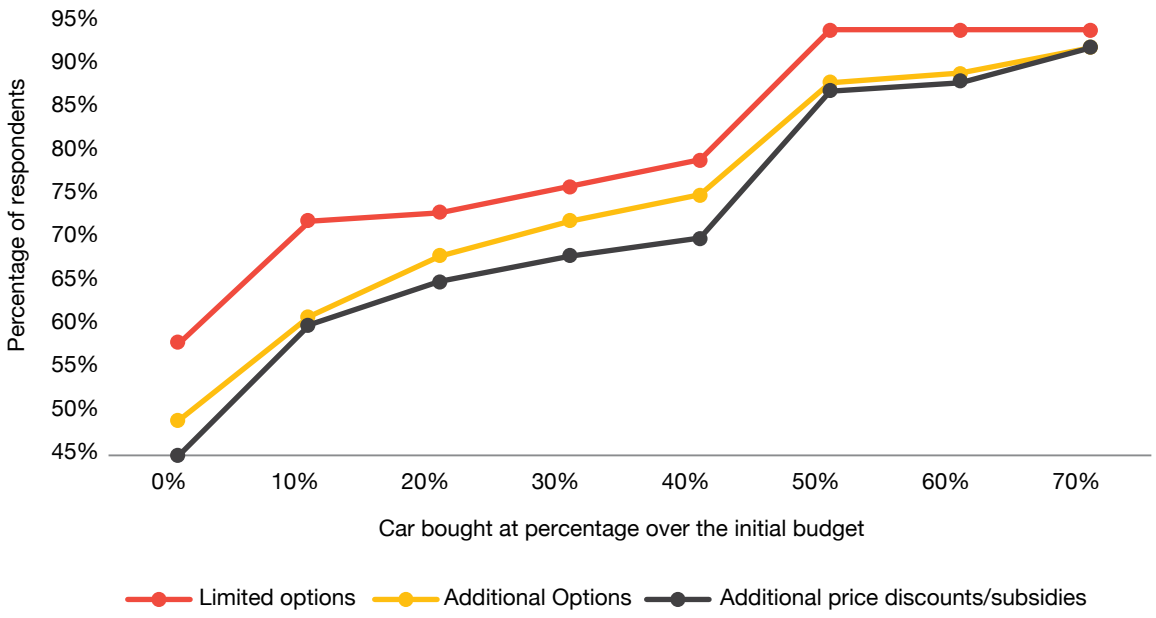
Priorities while buying a passenger vehicle (weighted sum index)



While most of the respondents stated a budget at the outset, not many stuck to the budget as they gained more information. Respondents were asked to choose their preferred model over five stages: (a) in the first stage, they were given a limited range of five models from five brands; (b) next, they were given 15 models from seven brands, (c) followed by a subsidy/price reduction in certain segments; (d) the subsequent stage included feature improvements in specific models; and finally, (e) they were given the option of a rental model with a flexible duration of ownership.

As the options increased and more information was provided, budget took a backseat for the respondents. For example, while 58% of the respondents chose to stick to their budget when provided with limited options, only 49% chose to limit themselves to it as more options were provided. This figure dropped to 45% when subsidies or a price reduction was offered. Similarly, while 94% of the respondents eventually ended up selecting a model which cost 150% of their initially stated budget, as more information surfaced, respondents were willing to go up to 170% of their initial budget.

With more exposure to information, respondents relaxed their budgets

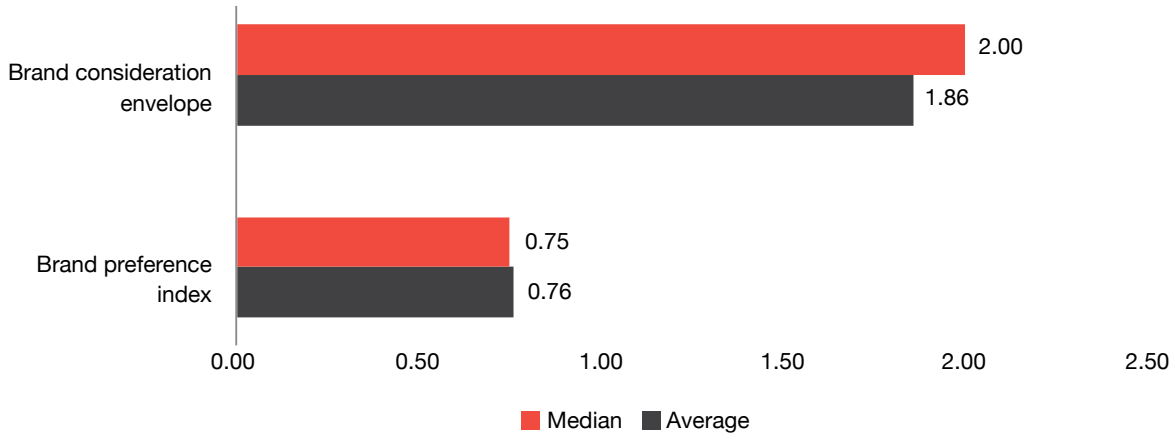


These findings may be relevant in the case of EVs. Showcasing the right information while also differentiating the incremental value proposition to consumers (in the case of our survey, incremental information focused on 'what else') could justify relaxation of budgets – for example, whole lifecycle costing, monthly expense comparator. The question is, what kind of information needs to be focused on, and how? Our survey provides some pointers.

Consumers need information that is easy to understand

One distinctive feature of consumers in the automotive market is the preference for brands.[9] In this context, two of our survey findings are noteworthy. The first is the average brand preference index of about 0.76, which suggests that three out of four times when options were provided to the respondents, they stayed with the same brand, even if they chose a different model. The second is the average brand consideration envelope of about 1.86, which suggests that the respondents' choices did not move beyond two brands. One aspect that clearly puts EVs at a disadvantage is the lack of options amongst most brands.

Brand Preference



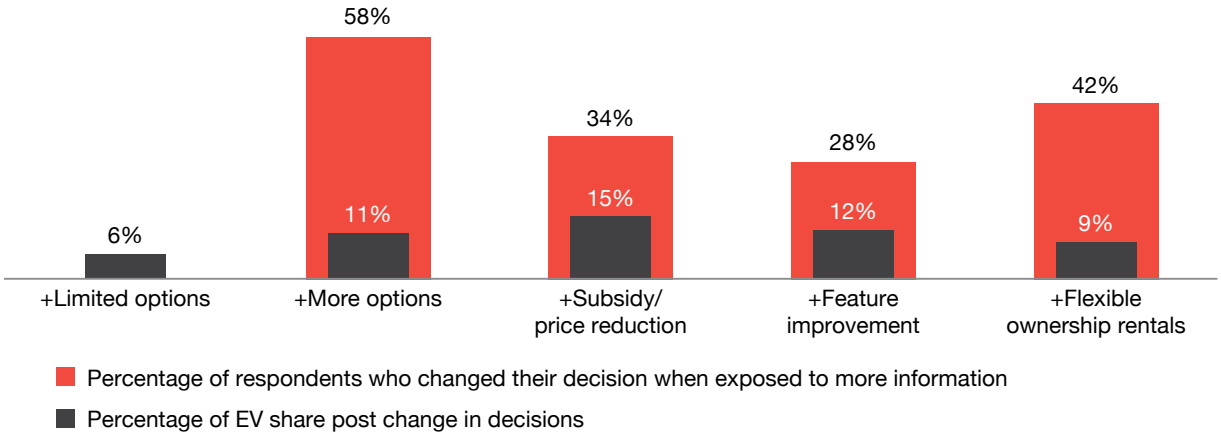
However, these preferences represent an opportunity. Focused efforts from the Government and industry to enhance the perception of EVs and build trust can help improve adoption.

9 The first option consisting of 5 models from five brands, including one EV, was not considered as the remaining four questions consistently offered the same seven brands and 15 models as options.

Consumers respond to certain incentives better than they do to subsidies

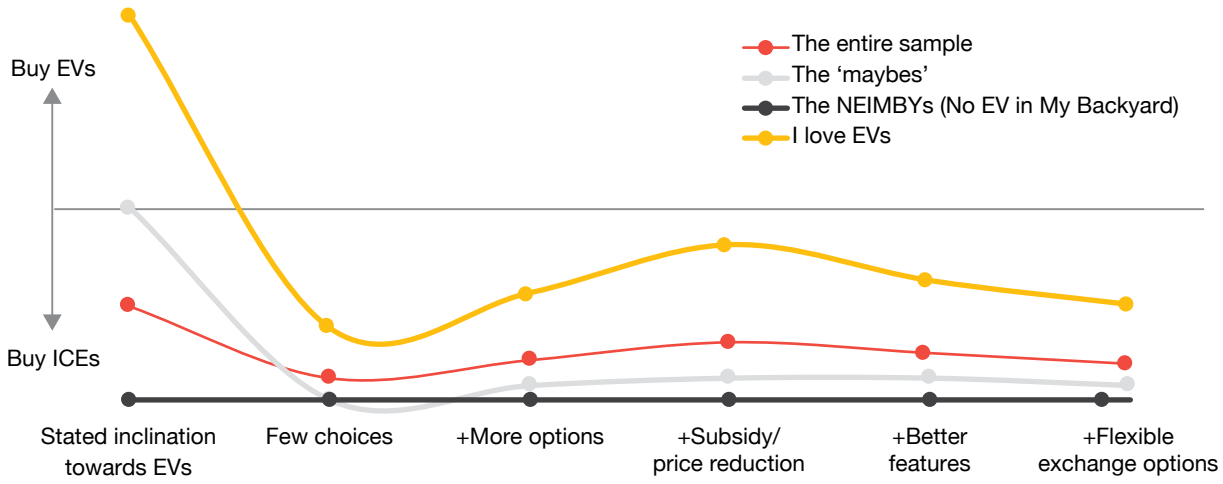
To a consumer, subsidies, offers and discounts – all boil down to reduced price. While EVs may get subsidies, discounts, offers or price reduction on ICE variants will quickly neutralise the benefits of subsidies. More importantly, strategic disruptions in the market may also wipe out the benefits of subsidies. As mentioned earlier, options were provided to respondents in five stages in order to understand how consumers react to information. The highest change in decision took place when more model options were provided (~58% of respondents changed their choice when the number of options increased from 5 to 15 models). However, the share of EVs did not rise significantly (to ~11% from 6%) despite the model share of EVs being about 20%, which is significantly higher than the actual market conditions. At the second level of information feed, subsidies did temporarily increase the EV share to about 15%, but was quickly brought down as soon as some ICE models announced improved features. The EV share went down substantially (to ~9%) when certain models announced rental schemes with flexible return policies (three-year minimum lock-in). The survey results could well play out in the market, with consumers overlooking subsidies or even price reduction.

While more options and flexible ownership concepts triggered relatively higher decision changes amongst respondents, not all options proved favorable for EV..



In fact, the assumption that subsidies alone can influence consumers to purchase an EV is debatable. Even pro-EV respondents in the survey opted to buy an ICE vehicle when provided with a slightly lucrative offer on the latter. On the other hand, customers with non-EV preferences did not switch to EVs.

How car buyers shift preferences in ICE vs EV choices with incremental change in information provided (average tendency)



Under such circumstances, it may be worth re-examining:

a. How does the Government allocate the budget – subsidies to consumers, building infrastructure, output-based grants to OEMs or R&D? The answer has to be well thought through. For example, charging infrastructure and driving range address similar problems of the consumer – the ability to reach one's destination without running out of charge. Therefore, how the budget is divided between the two should be analysed in detail.

b. How can OEMs create more features that differentiate EVs from ICEs? In their current shape, EVs in India may be perceived as expensive passenger vehicles with batteries. Emergency braking, advanced driver assistance systems, advanced navigation systems are upcoming features. Introducing these systems in EVs can possibly help customers see more value, and improve upon the 'safe and advanced mobility' theme further.

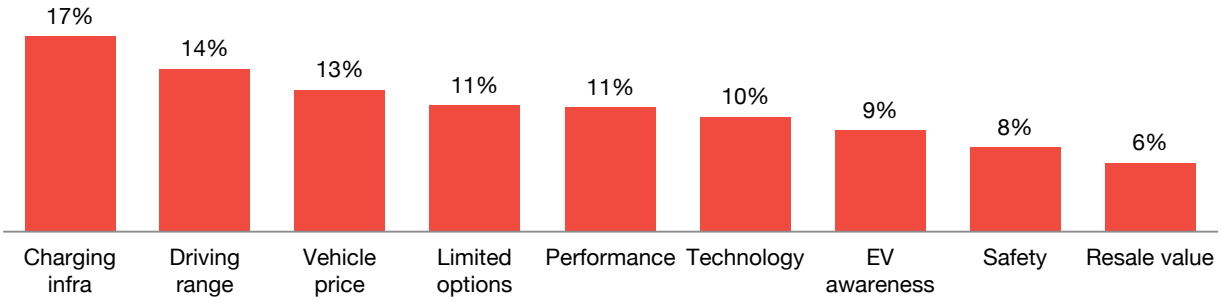
c. How can customer-centric acquisition be triggered? Providing a consumer first-hand experience of a product is a well-demonstrated technique for customer acquisition in the e-commerce industry. Similar strategies are also being used in the EV segment.

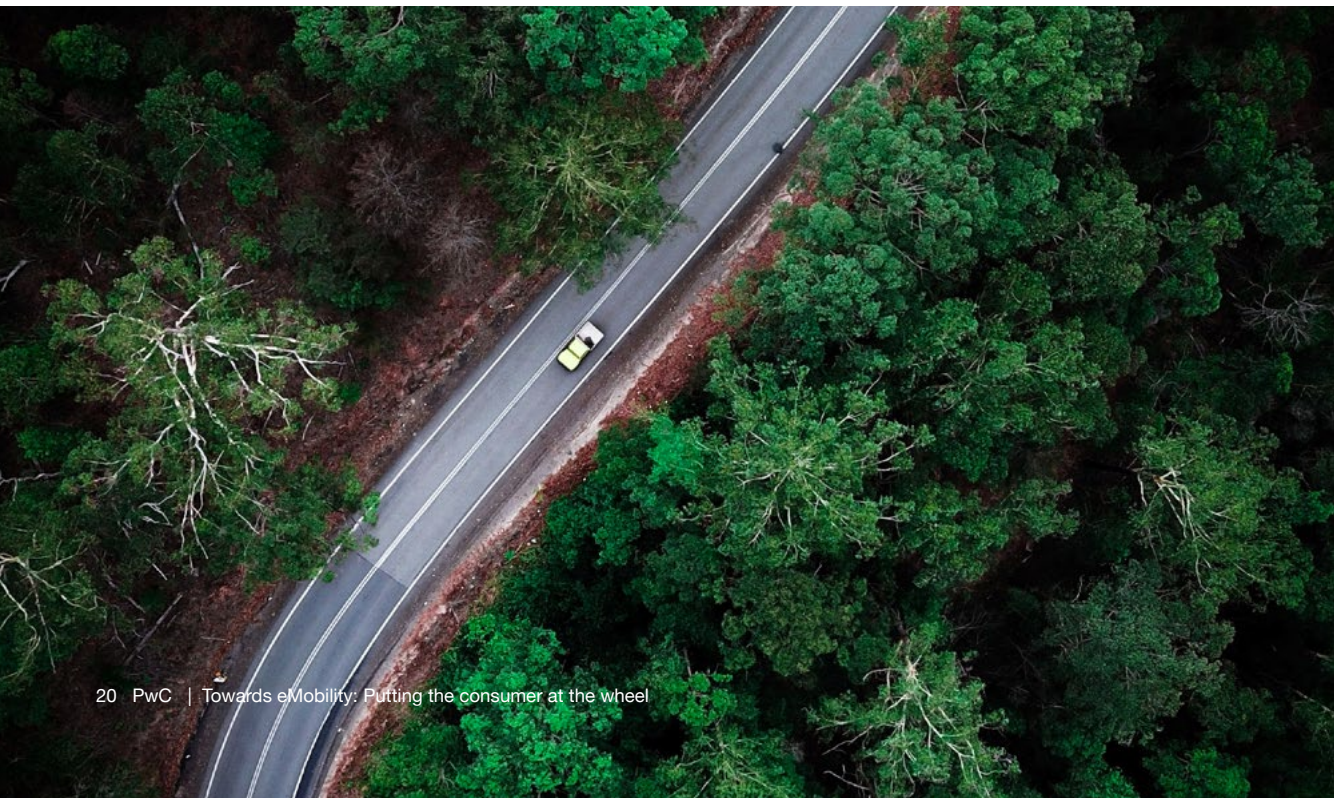
What consumers 'want' may not be what consumers 'need'

Based on the survey results, charging infrastructure, driving range and vehicle price were the top three consumer concerns pertaining to EVs. The common underlying factor between charging infrastructure and driving range is the ability to reach one's destination without running out of charge. Solving either of the two problems may alleviate the root concern.

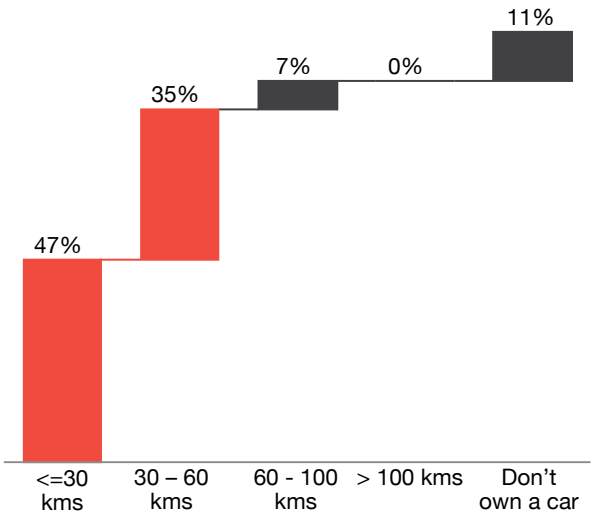
We arrived at this inference based on what the respondents said. Respondents were questioned on two aspects: (a) on an average, how much do/would they drive per day and (b) how many times during the year do they drive for long distances? As per the results, 82% of respondents drive less than 60 km per day. Today, EVs with a range of at least 100–140 km/charge range are available in the Indian market; these vehicles have a minimum practical driving range of about 80 km/charge. On the second question, about 73% of the respondents said they drove for long journeys by car.

Concerns about electric vehicle (weighted sum index) (n=106)

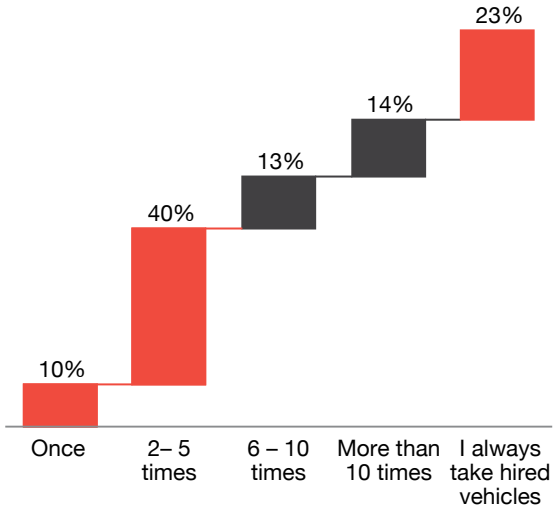




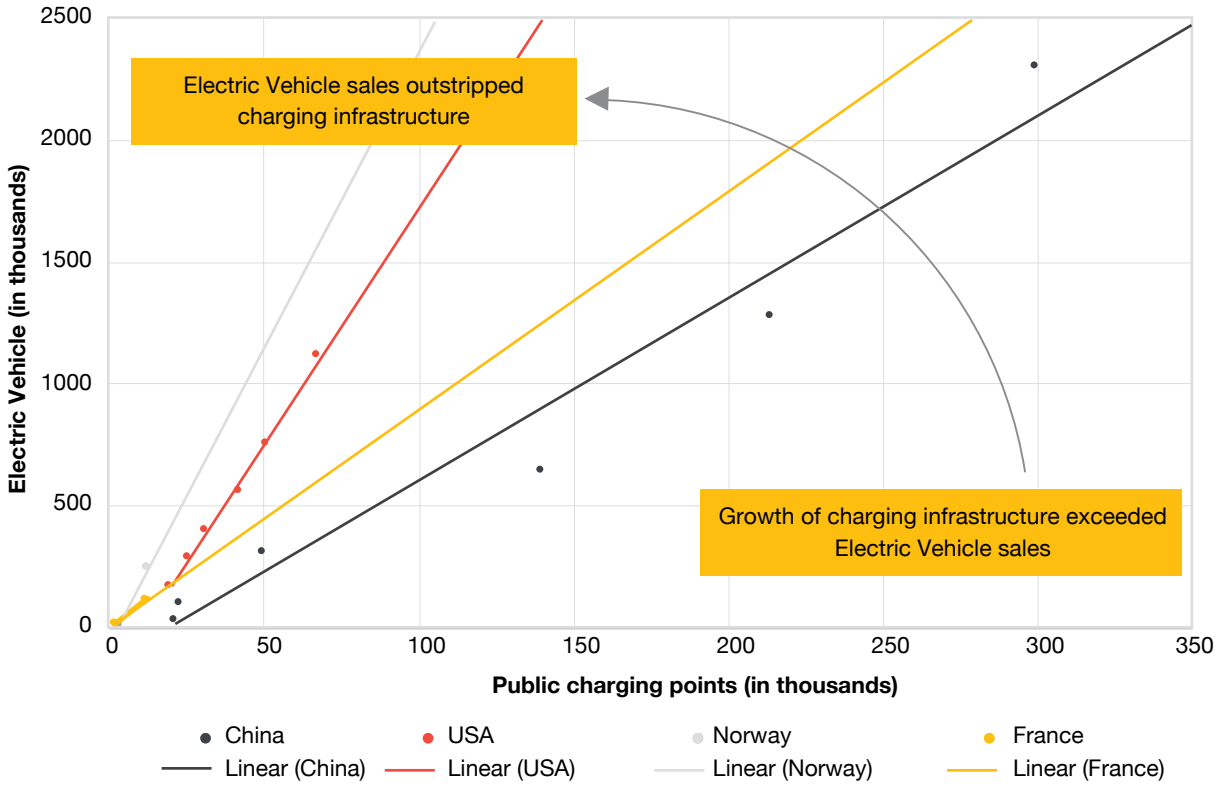
Distance travelled per day (n=106)



Number of long distance (>150 km) trips made per year (n=106)



There are two ways to address these concerns. The first is assuaging consumer anxiety by providing adequate access to charging infrastructure. The second one is reducing consumer anxiety by educating them about their own travel patterns and helping them understand what they need. To do so, a tool may be developed to help consumers understand their fitment to EVs based on travel patterns. After all, except for China where charging infrastructure has seen unprecedented growth vis-à-vis passenger vehicle sales, the ecosystems in countries such as Norway, the US and Sweden have evolved eventually along with passenger vehicle sales, if not after.



Source: Global EV Outlook 2019, EV charging in China and the USA, Center on Global Energy Policy (Feb 2019)

Consumers will need a further push, beyond charging infrastructure

Improving access to charging infrastructure will definitely address consumer anxieties, but to an extent. Over and above access, consumers will require assurance.]

We asked respondents if they have seen charging infrastructure in their cities, to test the hypothesis that consumers who had seen this infrastructure may have an improved preference for EVs. However, such improvement in preference was absent in the stated preferences of respondents. This is possibly due to the fact that charging infrastructure is still growing. Access to charging infrastructure certainly needs improvement. Given the challenges with financing, in the short term, allowing private charging infrastructure to be used for public charging may be helpful. Standardisation of tariffs and charging infrastructure may be needed, along with acceptance of electronic payment.

Further, among respondents who had seen charging infrastructure and were positively inclined, only 28% retained their buying preference for EVs. Why did 72% of this segment of respondents change their preference to non-EV? Sample structured interviews revealed that their concerns about running out of charge were deeply rooted. Apart from increasing charging infrastructure, one way of addressing the gap between access and assurance is improving information and data systems. For example, a GIS-based system with the ability to book charging space ahead of time may not only improve awareness of charging stations, but also provide assurance and a sense of instant gratification. Similarly, current efforts by the Government towards standardisation of chargers and batteries would reassure consumers by ensuring access to 'anywhere anytime charging'.

Stated preference

	Stated preference for EVs (Yes, maybe)	Stated preference for EVs (No)
Charging infrastructure seen in city	18	5
Charging infrastructure not seen in city	66	17

Intermediate preference for EVs

	Took a decision in favour of EV at any stage	No decision in favour of EV
Charging infrastructure seen in city	10	13
Charging infrastructure not seen in city	9	74

Buying preference

	Bought EV	Bought ICE
Charging infrastructure seen in city	5	18
Charging infrastructure not seen in city	5	78

Conclusion

04

Boosting the appeal of EVs

Nurturing the EV ecosystem at a time when the market has seen contraction can be a daunting task. Moreover, resources are limited, and they need to be leveraged carefully and with precision. At this stage, while the supply side is slowly evolving despite major concerns around incremental investments, the demand side will need to be boosted quickly. In doing so, the consumer will have to be made the central theme while designing strategies and policies.

The scope of this paper was limited to a specific passenger vehicle segment in India, and the survey was designed to understand (a) how consumers make decisions while buying passenger vehicles, and (b) the difference between the stated and inferred (if not revealed) preferences of consumers towards EVs. The four key takeaways from our survey may be summarised as follows:

1. **Show them the value:** For customers, price sensitivity in the market is defined by the value offered. On being provided with additional information, about 25% of the survey respondents made purchase decisions that exceeded their original budget by up to 40%, while another 22% overshot their initial budget by an additional 30% (i.e. 70% overall). Communicating the right information is key – for instance, lower running cost and operations cost.
2. **Make value easy to comprehend:** How does one communicate the value of EVs in a way that is easily understood and effective? Consumers' brand preferences provide opportunities for improving adoption.
3. **Reduce anxiety:** Educating consumers about their own travel patterns and helping them understand their actual requirements could reduce the reservations they may about EVs. One of the ways to address this issue could be to create a tool that can show consumers their fitment to EVs based on their travel patterns.
4. **Improve access and provide reassurance:** In addition to increasing charging infrastructure, one way of addressing the gap between access and assurance is improving information and data systems. For example, a GIS-based system with the ability to book charging space in advance may provide not only visibility of charging stations but also reassurance and a sense of instant gratification. Similarly, current efforts by the Government towards standardisation of chargers and batteries may further reassure consumers by giving them access to 'anywhere anytime charging'.

Finally, while this study focused on a relatively small segment of vehicles and consumers, it will be important to carry out a wider analysis of consumer needs across all segments. Such a study would not only help the Government in designing better strategies and policies for adoption, but also provide a thorough understanding of what the private sector can do to improve adoption, target specific consumer groups, and improve their sales.

Notes

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About ASSOCHAM

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Evolution of Value Creator
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ASSOCHAM derives its strength from its Promoter Chambers and other Industry/Regional Chambers/ Associations spread all over the country.

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The Associated Chambers of Commerce and Industry of India

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