Catalyzing Green Mobility: Consumer Preferences for Green Energy Vehicles

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Abstract. Due to growing urbanization and the increase of vehicles, most Indian cities endure traffic congestion and significant air pollution. As a result, alternate technology in autos, such as electric vehicles, may become necessary (EV). This study aims to identify consumer preferences toward electric vehicles in the Indian market. This research conducted a survey and analyzed the opinions of people regarding their preferences for electric vehicles, demographics, and some of the demotivation which might be stopping them to switch to electric vehicles altogether. This research will help in determining different factors influencing the perception of consumers toward electric vehicles and what they expect when they think about purchasing a new electric vehicle. It is important to understand that electric vehicles are really getting popular now because of the rising fuel prices and environmental concerns. People are thinking about electric vehicles and replacing them with their regular petrol or diesel vehicles. In this research there might be some challenges or roadblocks in switching to electric vehicles. This research found out that despite a favorable attitude toward electric vehicles, individuals are hesitant to transition to electric vehicles due to different hurdles connected with them. This research found out that mostly the preferences of the consumers are good charging infrastructure, a good range of the electric vehicle, pocket-friendly vehicles are the most common preferences of consumers buying an electric vehicle.

Keywords: Electrical Vehicle, Green Energy, Alternate Energy, Customer Preference

1. Introduction

The Electric vehicle (EV) revolution is accelerating, but without the requisite infrastructure and technology, it can only go so far. Visions of a brighter, more hopeful society emerge when thinking changes from fossil fuels to all-electric. The United Nations is encouraging e-vehicles usage so it will help to achieve Sustainable Development Goals of United Nations, as well as contributing to the larger good, such as the 2050 Climate Change Goals.

Electric cars do not utilize gasoline and instead rely on a massive battery to power one or more electric motors. All-electric vehicles now have driving ranges ranging from 80 to more...
than 200 kilometers, with ranges improving as new models are produced. In addition to avoiding the gas station, all-electric vehicles require less maintenance (such as oil changes, smog checks, spark plug replacements, and replacing a catalytic converter or other parts that wear out and break down) than gas vehicles.

All-electric cars may be charged at home with ordinary 120-volt or 240-volt house outlets, or at public or workplace charging stations.

1.1 Electric vehicles Market of India

The Indian electric vehicle market was expected to reach USD 1,434.04 billion in 2021, and predicted to increase to USD 15,397.19 billion during 2027, and the CAGR of 47.09 percent during the predictive period (2022-2027). Due to the suspension of production facilities and lockdowns caused by the COVID-19 epidemic, locally made electric cars were restricted. However, once limits were lifted, EVs saw positive development as customers grew more oriented toward inexpensive eco-friendly transportation, aided by government incentives. The automotive sector in India is has a greater number of 2-wheelers (scooters, motorcycles) and 3 wheelers (autos and rickshaws), these sectors play an important part in the country's last-mile transportation. Rising government attention and focus on private-sector and government-sector collaboration to improve the country's EV ecosystem. Major OEMs'(original equipment manufacturers) increased investments and product launches in the nation, as well as their focus on localizing supply chain facilities, is projected to provide a healthy market picture.

1.1.1 Necessity for EVs in India (2022)

In future, India will become one of the world’s largest markets in electric vehicle sector, a report given by World Economic Forum (WEF). Also, one thing needs to be stated that as much as we give importance to the Environmental factors, and while air quality is a major concern for electric cars, it isn't the factor behind the Indian Government and transform into green and electric vehicle.  

1.2 Literature review

Many studies were conducted all around the world for better understanding about customers of electric vehicles. The cost of the electric vehicle, the driving distance per charge, the time it takes to replenish the battery, the availability of charging stations, and the cost of the battery were all considered. Previous studies have looked into range anxiety and the incentives supplied, both financial and non-financial.

1.2.1 Preference and adoption toward electronic vehicles among youngsters:

The main focus of this study was to analyze the preferences of users using different types of vehicles and to find those influential factors for selecting a vehicle. Analyse about the gaining importance of electric vehicle throughout the world. The importance is because of the impact it has on the environment. The electric vehicle emits no or less gas which is harmful for the environment. Though electricity is produced using coal, again it is a fossil fuel, the effect on environment is less when compared with the conventional mode of
transportation. This electric vehicle helps in reducing global warming by emitting no greenhouse gases.

Analyze about the lifecycle of electric vehicle, policies to be drafted by the Government and few environmental issues relevant to India. The whole point of shifting from regular vehicles to E-vehicles is to decrease greenhouse gases which can only be done if the Indian government adopts some severe rules and regulations and few policies to improve the usage of electric vehicles, which control air pollution. The policies have to be designed to suit the international market. This will help our organizations to compete in the global market.

The technologies related to electrical vehicles are available in the market are operated either through battery or plug-in hybrid mode. This study talks about different technologies used in Electric vehicles. The population in India is one of the biggest problems and its contribution in pollution is high. The electric vehicle is an alternative solution for this problem and providing the E-vehicle customers with different subsidies shows that they want people to go for E-vehicles. The personal opinion is to think that the revolution in the automobile industry will not be coming in the four-wheeler segment. Instead, first, the two-wheeler segment is going to boom, the luxury people will shift to electric cars.

presented on evaluating the impact of changing from fossil fuel vehicle to electric vehicle. The paper conducts exergy analysis between the relationship of exergy electric and non-electric vehicles and the power of potential loss. The electric vehicles have a positive impact on environment and also enhance the environment.

analyse about the EV30 @30 Campaign, that aims to reach 30% EV sales by 2030, into account while measuring the impact and focuses on the opportunities and scope of E-vehicles in India and discusses various frameworks in regulation are created by the Government. The sales of electric vehicles in India is expected to reach a volume of 1.6 million in the coming fiscal year 2023. This is possible because three-wheeler vehicles and public vehicles help in achieving this target.

discusses the difficulties of implementing the other sources of powered vehicles in tier I cities. To overcome this, the Indian Government has to enforce regulatory framework and also organize national awareness programs to spread the benefits of electric vehicles among the people and the goodness of electric vehicles. It will help to improve the sales of electric vehicles.

examines factors affecting the change from conventional vehicle to electric vehicle. The focus of this research was on electric cars using primary and secondary data. There is a need to discover the market potential market in India for electric vehicles., additional research is needed with a larger number of samples and more criteria. research pointed out one of the most important things when it comes to the EV’s i.e., the petroleum fuels is in the verge of depletion. There is a necessity for us to change find some other source of energy. The Indian Government also takes initiatives to reduce pollution by giving subsidies for purchasing electric vehicles. Now a day’s many new start-ups are launching new brands.

Revolutionary changes in automobile industry happened due to drastic improvement happens in Information Technology and the usage of IOT. This helps in creating high standards in application of technology and made a huge impact on the standard of living. discusses the
Interpretive structural Modeling (ISM) helped the growth of Indian electrical vehicles market. ISM is a process which transforms poor and unclear mental models into a model which can be used for many purposes by changing it as visible and well defined one.

India, one of the world's fastest developing economies, has been a pioneer in meeting its obligations to a better clean environment. In this endeavor, it wants to embrace 30 percent of electric cars (EVs) by 2030. India's central and state governments have introduced a number of financial incentives to encourage the use of electric vehicles. Around 140 million EVs (which encompass the various vehicle categories considered in this research) might become a part of the transportation system, requiring approximately 24,600 MWh of power every day.

The Indian automotive sector is expanding in a higher rate and played a significant role in the country's economic growth and manufacturing establishments. Not only that, but India's automobile sector is also expanding. Manufacturing is estimated to account for 25% of India's GDP by 2022, up from 15% now, with new electric car manufacturing. The chatter of the town, However, India's electric car sector is still in its infancy. In comparison to other foreign markets, such as the United States, China, and Europe, among others, if the government provided a push. This research paper tries to find the reasons behind the degrowth of the Indian automotive industry and the rise of e-vehicles in India and throughout the world.

Focuses on the future potential and problems of electric cars in India. Electric cars are the greatest alternative to vehicles that run on fossil fuels. Because of environmental concerns, all governments throughout the world are supporting electric automobiles. The majority of new two-wheelers sold worldwide are electric, and India is following suit by increasing sales of electric cars. According to a Bloomberg NEF forecast, electric vehicles would outsell internal combustion engine vehicles by 2040, with a market share of around 60%. Because of their reduced emissions, electric vehicles are becoming more popular. Economic, social, technological, and environmental concerns influencing India's electric car industry are discussed.

The Indian Road transport industry is on the verge of making the switch from internal combustion engines (ICEs) to battery electric vehicles (BEVs). The Government of India (GoI) has launched a number of policy initiatives to encourage the use of electric cars (EVs). EVs, on the other hand, have a high initial cost but reduced operational costs. As a result, the economics of EVs vs ICE cars are determined by the amount to which they are used on a daily basis. The everyday use, in turn, might vary greatly depending on the circumstance. This study presents a model for comparing the total cost of ownership (TCO) of an EV with several fuel variations (petrol, diesel, and compressed natural gas [CNG]) of their ICE equivalents. It has been discovered that on average the normal average daily usage of the vehicles in Indian cities, the TCO per km of electric two-wheelers (e-2Ws) and electric three-wheelers (e-3Ws) is less than that of their ICE equivalents. In the case of hatchback and sedan automobiles, electric cars (e-cars) have a higher TCO per km than their ICE equivalents.
discussed about calculating the greenhouse gas emission from fossil fuels, and how this gas emission can be reduced is also can be calculated to know the advantage of electric vehicle. The most common forms of emissions accounting procedures used across the world include is by measuring the emission level from the vehicles with emissions from the corresponding volume of gasoline, and so on. As a result, it is critical to thoroughly assess the integration techniques are used to measure fuel consumption.

analyse the drawbacks of electric vehicles and establishing charging stations will be in the initial stages. During the early years the government was spending more funds for collaborative research to find alternate sources of energy for vehicles and to reduce the usage of fossil fuels. The paper also discusses about the major impediments of implementing the adoption programs of using electric vehicles in India. Charging stations has to be established in abundance, and there should not be any delay in recharging the batteries. There is a need for development of charging station or charging infrastructure.

discussed as total contribution by India towards greenhouse gas emission on earth is high. Due to increase of vehicles on the road, many cities in India facing a severe air pollution. To avoid this condition, India need electric vehicle. Policy decisions have to be taken by the Government of India regarding the technology as well as the investments to be made. And also talks about the barriers of electric vehicle growth in India.

The present study by analyse the reason of the user’s attitude, behaviour and what they speak about electric vehicle and the need for subsidy by the government, incentives, consideration of reducing the road tax and registration cost.

There is a rapid growth in transport industry due to the developing growth rate. In that growth, the electric vehicles are also growing equally. This happens because of the rising fuel price. The Indian Government is also spending around 70 percent of its foreign exchange to pay off the petroleum products. It’s the time where the country has to move to electric vehicles, thereby it can reduce pollution as well as save foreign exchange reserves.

Due to economic progress, the use of transport vehicles in India is growing rapidly. Electric Vehicles (EV) entered the market recently. India spends 70 % of its foreign exchange reserves on petroleum imports. Time has come to increase use of EVs many folds conforming to the global trend, which warrants a substantial increase in power availability. This paper describes details of IRG for meeting power demands of EV transportation in India. Applicability of this concept in other countries is also highlighted.

Statement of problem is difficult to comprehend the numerous elements that are driving and/or preventing EV adoption. As a result, this paper tries to evaluate the variables influencing EV adoption as well as an analysis of the current literature on the subject.

When it comes to grid-tied electric cars, the main focus is on the batteries that power them, as well as how efficient the system that revolves around those batteries is. From the perspective of the Indian market, the main concern is providing consumers with the appropriate infrastructure so that they can switch to EVs.

This research is being done to determine the consumer preference for the e-vehicle market in India, which will help us clarify whether people prefer to use electronic vehicles over regular
1.3 Objectives

The study's objective is to look at buy intent in terms of utility, as well as the impact of five major elements on purchase intention: government policies, economic factors, environmental concerns, social influence/social factors, and technological factors.

The second objective is to find the barriers in deploying electric vehicles in the Indian market that consumers are sceptical about buying electric vehicles. The reason for formulating this objective is to basically understand the barriers and roadblocks because consumers are second guessing their decision of buying electric vehicles and what can be done to make them understand the benefits of electric vehicles and help them make a better decision.

Third objective is to find ways electric vehicles can be deployed in Indian markets efficiently to help consumers make better choices. The main reason for formulating this objective is to help the consumers make a better and informed decision by creating awareness about electric vehicles and the misconceptions about electric vehicles can be cleared so, it's going to be beneficial for the consumers and their preferences can be considered.

The target population for this research was people between the ages of 18 and 50 who understand what electric vehicles are and how they are the future of the automotive industry; only by doing so could an effective study of consumer preferences towards the electric vehicle market in India be conducted.

The sample size of this research was 162 people whose ages were from 18-to 50 they answered a bunch of questions in our questionnaire which we prepared. The questions in the questionnaire were divided into two parts. The first was for their basic information like age, income, gender, etc. and the second part consisted of questions based on a 5-pointer scale for their level of agreement and disagreement with the statements. These questions were based on the research factors that we considered for our research like Political, Social, Economic, Technological, and Environmental factors.

The survey is to look at Indian customers' intentions to buy electric vehicles. The research done was divided into two sections. The beginning part deals with demographics of the respondents, while the second section addressed elements connected to different variables influencing EV purchasing intentions. To create the instrument, the researchers used existing scales.

The data used for the study is collected through questionnaire and based on 5 factors that are being considered for this research first technological factors like battery-powered vehicles and new technology involved in the EVs, political factors like some government policy regarding Electric vehicles and their adoption, economic factors like how economically feasible it is for the consumer to switch from regular petrol, diesel vehicles to electric vehicles, environmental factors like less carbon emission and less damage to the environment and some social factors like the consumer’s social image or public image are there any impact on that if they go and buy an electric vehicle over regular vehicles.
Basically, this is research on what the preferences of consumers are towards electric vehicles currently and what they expect the electric vehicle industry to provide them so they can have a smooth switch from regular petrol-diesel to electric.

The research instrument which is being used for this research is the questionnaire, which was prepared to collect the primary data from the consumers or prospective consumers of electric vehicles.

Going forward we’ll be using correlation and regression analysis approaches to analyse the data collected which will give us a better understanding of the relationship between all these considered factors and the preference of consumers towards electric vehicles.

H1: Government Policies do affect the decision making of customers with regards to purchasing E-vehicles

H2: Social Influence/Social Factors do affect the decision making of customers with regards to purchasing E-vehicles

H3: Environmental Factors do affect the decision making of customers with regards to purchasing E-vehicles

H4: Technological Factors do affect the decision making of customers with regards to purchasing E-vehicles

H5: Economical Factors do affect the decision making of customers with regards to purchasing E-vehicles

2 Analysis & interpretation

This study project's fourth chapter is the analysis stage, in which we examine the primary and secondary data acquired through questionnaires and credible websites, respectively. The shared questionnaire had 19 questions that assisted us in analyzing the customer's preferences in relation to the five categories. By sending out a questionnaire, we were able to obtain primary data for this study. Our study was based on five factors: first, technological factors such as battery powered vehicles and new technology in EVs, political factors such as government policies on electric vehicles and their adoption, economic factors such as how economically feasible it is for consumers to switch from regular gasoline and diesel vehicles to electric vehicles, and environmental factors. To make the analysis easier, we utilized multiple-choice questions and linear scales whenever practical, and included an additional option of 'other' where the responder might describe their perspective. This aided in obtaining both particular and broad replies, making the analysis easier. As a result of the direct reaction of the people in the sample, the analysis is more trustworthy.

This study is a cross-sectional examination of 162 people from a prospective cohort study based on self-reported questionnaires (105 men and 57 women). The customer preference for the Electronic Vehicle market in India was determined using factor analysis based on five predetermined parameters. The link between the 5 indicated parameters was assessed using multiple regression and correlation models.
The demographic factors are Males accounted for 65.3% of the responses, while females accounted for 34.1%, with 0.6% fell in the category of prefer not to say. The majority of responders (71.3%) were between the ages of 18 and 30, with 24% falling between the ages of 30 and 50. Only 4.8% of our sample was beyond the age of 50. Most of the respondents were Students contributing 67.3% and Employed people contributing 21.6%, 6.8% people were unemployed and the rest fell in the category of Self-employed i.e., 4.3%. The majority of respondents (67.7%) belonged to the income bracket of 0-5 lakhs, while 21% belonged to the income bracket of 5 lakhs to 10 lakhs, 7.2% to the income bracket of 10 lakhs to 20 lakhs, and the remaining 4.2% to the income bracket of 20 lakhs and above. Out of the 162 responses that we got, there was a tie of 26.9% between those who were willing to buy an electric vehicle and another 26.9% of people who were unsure about their decision and didn’t know if they wanted to buy an electric vehicle or not, and 24.6% of the people were very sure that their next purchase was going to be an electric car or an electric bike. There were 10.8% of people who didn’t want to buy an electric vehicle.

Around 46.7%, was of the opinion that they will most likely buy electric vehicles if the government starts giving subsidies. Only 10.2% of those polled said they will not buy electric vehicles even if the government offers subsidies, while 15.6% are undecided about whether they will buy an electric vehicle if the government offers subsidies. The respondents of 44.3%, would be willing to buy electric vehicles if the government gave road tax benefits for buying electric vehicles, and only 8.4% of the people were not willing to buy electric vehicles even if the government gave road tax benefits. Here also, 17.4% of the people were standing between making a decision to buy or not buy an electric vehicle. Majority of the respondents, 47.89%, were willing to buy electric vehicles if the EV companies started giving good warranties on the life of their lithium-ion batteries. For example, Tata gives an 8–10-year warranty on their batteries of NexonEV. 35.3% of the respondents believed charging time is really important factor to consider while purchasing an electric vehicle, and 4.8% of the respondents said charging time as a factor didn’t matter while purchasing an electric vehicle.

43.7%, distance covered by an electric vehicle is a major reason to buy electric vehicle, and for 6.6%, it doesn't matter that much, 33.5% of the people are unsure about their decision and they aren’t sure about considering the range of an electric vehicle as an important factor for their purchase decision.

There was a tie between the people who were unsure about this statement and those who somewhat agreed with this statement. 30.5% of people think that buying electric vehicles does save more money for the consumer, and 7.2% of people think buying electric vehicles does not save more money for the consumer. a majority of the population, 54.5%, believes that electric vehicles are definitely good for the environment and only 6.6% of people believe it doesn't benefit the environment. And 35.3% of people think that they can definitely help in reducing global warming and 35.9% of people think they might help in reducing global warming. Only 6% of people believe that it can’t help in reducing the global warming situation.

Other preferences that people listed were:

- Social influence
- The electric vehicle's range
- Proper maintenance facilities, more choices for the consumer in the market.
- Charging infrastructure
• their EV's resale value

and other demotivating factors listed by the respondents were:

• Unwillingness to change a lifestyle
• After Sales services
• Lack of charging infrastructure
• Poor resale value
• Breakdown maintenance at remote locations
• Accidents like battery explosions

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<th>Table 1. Regression models</th>
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<td><strong>Model-1 : Dependent Variable: Purchase Intention</strong> ( R^2 =0.525 )</td>
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<td>( (\text{Constant}) )</td>
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<tr>
<td>Govt</td>
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<td>Technology</td>
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| **Model-2 : Dependent Variable: Personal Image** \( R^2 =0.284 \) |
| \( (\text{Constant}) \) | 0.954 | .425 | 2.242 | .026 |
| Govt | 0.398 | .110 | 0.359 | 3.620 | .000 | Accepted |
| Technology | -0.062 | .100 | -0.055 | -0.622 | .535 | Rejected |
| Economy | 0.150 | .101 | 0.135 | 1.480 | .141 | Rejected |
| Environmental | 0.185 | .085 | 0.186 | 2.179 | .031 | Accepted |

| **Model-3 : Dependent Variable: Satisfaction** \( R^2 =0.284 \) |
| \( (\text{Constant}) \) | 0.954 | .425 | 2.242 | .026 |
| Govt | 0.398 | .110 | 0.359 | 3.620 | .000 | Accepted |
| Technology | -0.062 | .100 | -0.055 | -0.622 | .535 | Rejected |
| Economy | 0.150 | .101 | 0.135 | 1.480 | .141 | Rejected |
| Environmental | 0.185 | .085 | 0.186 | 2.179 | .031 | Accepted |

The regression analysis is carried out to test hypothetical relationship between the independent and dependent variables. There are three models tested having three variables as dependent variables namely Purchase Intention of E-Vehicles, Personal image on having E-vehicles and Satisfaction on using E-Vehicles. The R Square value of 0.533, indicating a moderate prediction of the model. In all the three models, the two independent variables namely Govt. Support and Environmental Concern found to be significantly predicting the dependent variables. Hence the related hypothesis are accepted in the study. The other two independent variables included in the study namely Technology and Economy are not significantly influencing the dependent variables in all the three models, which are proved by the significant value of more than 0.05.

2.1 Findings

The factors like the government providing some kind of benefit for buying electric vehicles, the economic viability of the EV, how pocket friendly it is for the consumer to buy an electric vehicle, concern for the environment, excitement for new technology, or fear of adopting new technology, social influence of a person how the society will look at him/her when they
are buying an electric vehicle, these are some of the factors which influence the decision of
a consumer of buying or not buying an electric vehicle. The political or the government
factors are the most dominant factors in all the factors. If the government provides some kind
of subsidy, road tax, or other tax benefits, if the government starts spending money on EV
infrastructure like charging stations these factors influences the consumer’s decision the
most. If sufficient infrastructure is provided, the buyers accept electric vehicle in future.
Mostly the preferences of the consumers are good charging infrastructure because this will
help more consumers to buy electric vehicles without the fear of getting stuck somewhere if
the battery of their car is low or there is no battery at all because the survey also showed
mostly all the respondent are worried about the charging infrastructure while buying an
electric vehicle and interrelated to this is the limited range in electric vehicles because of that
also there is a fear of getting stuck somewhere so they don’t drive/ride their electric vehicles
for long distances or they don’t want to buy electric vehicles for these reasons. Many factors
like charging infrastructure, battery life and cost, after sales services, resale value are having
negative effect on buying decision of the respondents in India.

The findings indicate a favourable perception toward the expansion of electric vehicles
industry. individuals are hesitating to transit from fuel enabled vehicle to electric vehicles
which affects the industry.

The expansion of the EV industry, is due to current government policies only contain
subsidies for purchase costs and infrastructure construction, but the lack of concrete policy
while considering safety and dependability, which may be addressed by giving subsidies such
as motor insurance, residual value subsidies, and so on. In addition to the actions made by
the government, auto manufacturers must seek to improve vehicle performance by
committing more cash to research and development operations. Meanwhile, buyers also
hesitant and following a wait and watch approach and are ready to wait till there is a mass
production so that price of the EV will reduce and comparable with that of regular petrol
diesel vehicles, at which point switching to EVs would be reasonable.

The respondents' top two worries are battery cost and purchasing cost. This obviously
indicates that additional efforts are required to reduce the cost of EVs. One of the main
reasons for the expensive EVs is that the main components are lithium-ion batteries which
are required for powering the electric vehicle are not manufactured in India and needs to be
imported from outside which eventually increases the price of electric vehicles and other
reason can be limited options of electric vehicles in Indian market so, there is not enough
supply and hence the simple rule of law of supply when the supply of a particular product is
not up to the mark it eventually increases the price of that particular product.

With the depletion of fossil resources and the ongoing rise in fuel prices, India needs an
energy transition in automobiles. The government has taken action to reduce pollution levels
by encouraging EVs and providing purchasing incentives. The government has relaxed FDI
rules in order to promote output. Several new brands are developing. EVs are being
introduced in India. The government and manufacturers should work together to construct
the infrastructure and provide a favorable climate for EVs. Respondents are aware of global
climate concerns and are willing to switch from Vehicles ranging from conventional to eco-
friendly. When considering the purchase of an EV, the cost is a significant consideration.

The heatwaves of the summers of 2022 have resulted in several incidents of electric two
wheelers catching fire. Start-ups like Ola, Okinawa, Pure EV, Jitendra Electric Vehicles, and
many more e-scooter companies have encountered unprecedented EV fires. As a result,
Union Minister of Road, Transport, and Highways Nitin Gadkari personally inspected Ola Electric scooters while meeting with Ola CEO Bhavish Aggarwal.

The meeting comes just days after the government initiated an investigation last month after an e-scooter introduced by Ola, the ride-hailing company's electric mobility business, caught fire in Pune. According to the road transport ministry, the Centre for Fire Explosive and Environment Safety (CFEES) was tasked with investigating the conditions that led to the occurrence and recommending corrective steps.

Due to some of these very recent incidents of EVs catching fire which is happening mostly with the electric scooter consumers are second-guessing their decision of shifting to electric vehicles because this is not at all a good sign or good news for anyone who is a first-time consumer of an EV this doesn’t help in making a positive image of the electric instead it’s only pushing prospective consumers away in the responses also many respondents mentioned these incidents a big demotivating factor for them to consider an electric vehicle as their next purchase.

3. Conclusion

On the basis of our analysis, interpretation of data, and the findings we would like to conclude this research by saying that majority of the population who has a little understanding of electric vehicles have a positive mindset toward the purchase of electric vehicles but there is still some barrier like lack of charging infrastructure, lack of consumer choice in the Indian market for good electric vehicles, proper after-sales services, awareness about the total cost of ownership of electric vehicles, range of electric vehicles. These are some of the barriers which need to be taken care of so, the electric vehicle space becomes more consumer-friendly and motivates more consumers to switch to an electric vehicle from regular petrol diesel engines.

Other barriers like lack of trust toward new technology, and afraid to change already established lifestyles can be taken care of by spreading awareness about electric vehicles and their benefits of electric vehicles.

Government and the manufacturers will have to work together to achieve this because from the responses that we got we can conclude that government policies play an important role in this shift to electric vehicles and when the manufacturers help the government helps the manufacturers it’s a win-win for everyone consumers, government, manufacturers and the whole nation as we go toward a much less carbon emission alternative to commute to work, school, college, etc.

Recently some incidents occur with electric scooters catching which came out as a really negative for the EV space as a whole and because of this now consumers are really scared to buy EVs already there were so many roadblocks now, there is need to be taken care of this problem for consumers to again trust EVs and then only everyone is going to enjoy the benefits of electric vehicles like low emission, easy to drive, less overall pollution, low maintenance cost, etc.

4. Suggestions and Recommendations

It is necessary to raise awareness regarding cheap maintenance and ultra-low operating costs. Using such measurements, clients should be persuaded that the entire cost of ownership of
EVs will be lowered by half, even if the purchase price is greater. Among the social aspects, the public charging infrastructure is also something that needs to be considered.

For the effective deployment of EVs, a dense network of charging stations is required. The results of this study indicate a favorable association between infrastructure and public acceptance, which is the outcome of significant expenditure spent on the establishment of charging infrastructure. To offer quick charging, charging stations placed on highways must be fitted with smart on-grid infrastructure. Operational connectivity should be built among the stations as well so that the driver is advised of the nearest charging station in the event that his car requires urgent charging. To facilitate the speedier deployment of EVs in the Indian market, innovative business models such as enabling private players to develop and operate charging stations must be used.

There is a need for government to start pushing new talented entrepreneurs in this EV space so, the problem of lack of consumer choice gets solved and consumers can choose from different products because when there are only one or two big players in the market, they decide how the market will function and when there is more supply in the market eventually prices also will come down so that EVs are an expensive problem also can be solved. Although there are startups in the EV space there are things happening but when the government comes into play and joins hands it’s a motivation for the businesses that they are doing something revolutionary and as a nation, everyone grows when things like this happen. To grow India's EV ecosystem, an integrated government organization is required. Six ministries and the NitiAayog are jointly responsible for developing and implementing EV-related “action plans.” The Ministry of Power is in charge of constructing charging stations as well as assuring grid stability. Under the national government's Faster Adoption and Manufacturing of Electric Vehicles (FAME) initiative, the Department of Heavy Industry offers incentives to EV purchasers.

The Ministry of Urban Development is launching a program to increase the use of electric vehicles in urban areas, while the Ministry of Road Transport and Highways is acquiring EVs for public transportation.

State and local governments must be incentivized to construct public charging stations that meet their unique needs. Research from nations with the highest EV sales, such as China, Norway, and the Netherlands, has shown that more public charging stations, rather than monetary incentives, are the most important element driving EV adoption.

The dearth of public charging facilities in India is a major impediment to the adoption of EVs. Furthermore, as demonstrated by Ola's pilot project in Nagpur, high recharging costs and long wait times despite about one charging station for every 17 cars have led to the shared mobility firm's drivers quitting the EV program and resorting to diesel vehicles.

References

firm’s drivers quitting the EV program and resorting to diesel vehicles.

Furthermore, as demonstrated by Ola’s pilot project in Nagpur, high recharging costs and long waiting times have been major impediments to EV adoption. The dearth of public charging facilities in India is a major impediment to the adoption of EVs. Countries such as Norway, and the Netherlands, have shown that more public charging stations, rather than relying on home充电 stations, can significantly increase the adoption of EVs.

State and local governments are aware of the importance of public charging infrastructure and are taking steps to increase the number of charging stations. The Ministry of Urban Development is launching a program to increase the use of electric vehicles in urban areas, while the Ministry of Road Transport and Highways is acquiring EVs for public transportation.

Researchers from nations with the highest EV sales, such as China, have identified that incentives and support from the government are key drivers of EV adoption. Incentives, such as tax breaks and subsidies, can significantly reduce the cost of EVs for consumers and encourage them to adopt them. The national government’s Faster Adoption and Retail Sales of Electric Vehicles (FàSER) scheme provides incentives to private consumers and fleet operators to adopt EVs.

The Ministry of Natural Resources and Environment is also working to build a grid infrastructure that can support the high adoption of EVs. The government is committed to making sure that the grid can handle the increased demand for electricity as more vehicles are electrified. The government is also working with utilities to ensure that EVs can be used to increase grid stability and efficiency.

To grow India’s EV ecosystem, an integrated government organization is required. Six ministries and the Niti Aayog are jointly responsible for developing and implementing EV policies. The role of the Ministry of Science and Technology is to provide research and development funding to promote EV technologies. The Ministry of Finance is responsible for setting the right incentives and tax policies to support EV adoption. The Ministry of Power is responsible for building the grid infrastructure necessary to support EVs.

Public charging infrastructure needs to be built among states and cities. The government recognizes that the provision of charging infrastructure in India is a major challenge. The government is working with private entities to establish charging stations in strategic locations such as parking lots, malls, and highway rest stops. The government is also exploring the possibility of using public transport vehicles as mobile charging stations.

Although there are startups in the EV space, there are things happening. The government needs to play a role in providing the necessary support and resources to make the EV market more competitive and diverse. When there is more supply in the market, consumers can choose from different products. When there are only one or two big players in the market, they have a higher ability to influence consumer choices. So, the problem of lack of consumer choice gets solved. The government comes into play and joins hands it’s a motivation for the businesses that they are doing something revolutionary and as a result, the businesses multiply.

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