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Study Consumer Perception on Electronic Vehicle

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Abstract -

With the change in time and increment in technology humankind have come up with another energy resource to run vehicle and save depletion of fossil fuel and its price hike. The electric vehicle as a solution for the world's industry and environment. Despite countries enacting EV policies, the current market penetration of EVs is very low. With advancements in power electrics, energy storage, and support, the electric vehicle (EV) is the solution for lowering greenhouse gas emissions. When compared to internal combustion engines, the plug-in hybrid electric vehicle (PHEV) offers comparable driving range and fuel economy. The current state of electric car technology is discussed, as well as future trends. The significance of rapid development of electric motors, power electronics, microelectronics, and new materials is highlighted. The future market size of electric vehicles is explored, as well as prospective electric vehicle impacts.

Keywords - Electronic Vehicle, Consumer Perception, Electronic car, Environment friendly, Battery Technology, Purchase Intention, Price Value.

Introduction -

The third-largest road network in the world is found in India. In India, road travel appeared to be the main mode of transportation, with over 60% of the population commuting by personal or shared vehicles.

Many businesses have adopted electric vehicles (EVs) for their fleets because of rising fuel expenses and a push for greener initiatives. EVs, which are known for their fuel efficiency, can be a cost-effective solution to save running costs. EVs are a greener option to gas or diesel automobiles, in addition to lower fuel expenses. They can lower a fleet's greenhouse gas emissions by eliminating exhaust. This benefit aids firms

in remaining sustainable and compliance with government regulations. Internal combustion engines (ICEs) in conventional cars run on fossil fuels such as gasoline or diesel. Electric vehicles (EVs) include one or more electric motors that are driven by rechargeable lithium-ion batteries, like those used in smartphones and laptops. EVs, like other modern devices, require external electricity to charge. Other types of batteries rely on regenerative braking or producing electricity from the frictional energy of the vehicle to charge. Lithium-ion batteries are often more efficient than fuel engines, in addition to being less polluting. Many have an 8–10-year guaranteed life span.

Because EVs are not powered by fossil fuels, they may lack some components found in ICE vehicles. Parts like fuel lines, fuel tanks, and tailpipes, for example. This means that most electric vehicles (EVs) do not emit carbon dioxide (CO2), which helps to minimise air pollution.

The National Electric Mobility Mission Plan (NEMMP) 2020 is a National Mission document that lays out the vision and, as a result, the road map for EV uptake and manufacturing. This plan aims to improve national fuel security, provide inexpensive and ecologically friendly transportation, and help India's automobile industry become a global leader in manufacturing.

Objective of Research –

- To understand Consumer Perception on Electric Vehicle.
- To assess consumer awareness of electric vehicles (EVs).
- To gain a better understanding of the elements that influence the purchase of electric vehicles.

Literature Review -

The goal of this study is to investigate the connections between electric vehicle-related data and customer views of EVs and adoption plans. This study found that environmentally friendly information, as well as performance and attribute information on EVs, are positively associated with customers' perceived value and trust in EVs, according to survey data. The favourable links between environmentally friendly information and performance and attribute information, as well as customers' perceived value and trust, are, however, reliant on the quality of the information. The correlations between EV-related in- formation and perceived value and perceived trust are positively moderated and strengthened by information quality. Furthermore, customers' intentions to embrace EVs are favourably connected with perceived

value and perceived trust. Policy implications and ideas to further promote EVs are based on the research findings. (Zhang et al., 2022)

Customer perception is a concept that more and more businesses are incorporating into their strategies, but for this to work, there must be clarity about what customer satisfaction entails and what has to be done to increase it. The major goal is to learn about customers' attitudes toward the company's sales and service, as well as to analyse customers' needs using primary data. A sample of 150 people was gathered for this reason, and percentage analysis and chi-square analysis were employed as tools. The conclusion is that the quality of work with showrooms can be improved in the future, resulting in enhanced customer satisfaction. (Vakil et al., 2021)

Considering global warming and climate change, switching from combustion to electric vehicles can help cut greenhouse gas emissions while also improving air quality. High acquisition costs and low driving ranges, on the other hand, are seen as major barriers to EV adoption. Because electricity must be generated from renewable energy sources for EVs to be considered truly green, the environmental performance of EVs is expected to be a significant factor. This study looks at how environmental performance compares to price value and range confidence when it comes to EV buying intentions. The idea that the environmental performance of EVs is a greater predictor of attitude and consequently purchase intention than price is supported by structural equation modelling results. (Abarca, 2021)

With advancements in power electrics, energy storage, and support, the electric vehicle (EV) is the solution for lowering greenhouse gas emissions. When compared to internal combustion engines, the plug-in hybrid electric vehicle (PHEV) offers comparable driving range and fuel economy. The current state of electric car technology is discussed, as well as future trends. The significance of rapid development of electric motors, power electronics, microelectronics, and new materials is highlighted. Various electric drive systems, battery systems, and super capacitor technology have been compared as a way to boost the energy capacity of PHEVs. The future market size of electric vehicles is explored, as well as prospective electric vehicle impacts. (Mishra, 2020)

By combining consumer perception and personality, the study constructs a personality-perception-intention framework to investigate the antecedents of consumer EFV-purchase intention. The study investigates two variables of utilities (positive and negative utilities) of customer perceptions on EFV-purchase intention using the valence framework. Positive utility is represented by three measures: perceived environment, perceived monetary advantage, and perceived symbol, whereas negative utility is represented by two measures: perceived fee and perceived risk. The effects of two personality traits

(personal innovativeness and sustainability) on EFV-purchase intention are also investigated. Positive utility mediates the personality characteristics as well. In addition, the study looks into the link between consumers' intentions to acquire EFVs and their actual purchasing behaviour. These findings provide a substantial theoretical contribution and give business and policymakers with advice. (Anjam et al., 2020)

This study will look at the relationship between Stimuli Factors, Consumers of Electrical Vehicles (EV) and Hybrid Vehicles (HV), and Response Purchase Decisions (S-O-R), as well as the moderating effects of Psychological Inputs on the S-O-R relationship in the vehicle sector. Except for the interactional link between Stimuli components, which include marketing inputs, external environment, and positive psychological inputs, which affect reaction purchasing decisions, the results show that all of the relationships had a positive significance. To put it another way, the mediation (HVs & EVs consumers) makes a significant difference in the prediction of response purchasing decisions, however the moderated influence of psychological inputs does not. (Rahahleh et al., 2020)

This research aims to contribute to the organic combination of consumer behavioural traits and the growth of the electric vehicle market. The consumer behaviour of EVs is researched based on the analysis of relevant research at home and abroad, and factor analysis is utilised to reduce the feature categories in order to acquire consumers' behaviour characteristics of EVs. From the perspectives of existing technology and prospective future technology of EVs, proposals are made to nurture the EV market based on the features of consumer behaviour of EVs. (Yang et al., 2018)

The goal of this article is to improve policymakers' understanding of people's views of EV policies and the potential implications. It also aims to look into how shifting behaviour patterns at the individual level can produce normalcy and reshape the architecture of choice for others. According to the study, economic and technical features of EVs, as well as symbolic aspects of EVs, such as feeling more environmentally responsible, were vital for Norway's successful acceptance of the technology. As a result, we suggest that the successful introduction of the electric automobile was aided by a mix of strong economic incentives, environmental consciousness, and a pleasant driving experience. (Ingeborgrud & Ryghaug, 2016)

The purpose of this study is to see if consumer attitudes toward electric vehicles (ATEVs), subjective norms (SNs), and perceived behavioural control (PBC) are linked to consumer purchase intention (PI) and purchase behaviour of environmentally friendly automobiles (EFVs). Confirmatory factor analysis (CFA) and structural equation modelling are used to analyse the outcomes of the survey questionnaires (SEM). The results of this study show that ATEV, SN, and PBC have a significant impact on PI. This data also suggests that the respondents' PI is unaffected by environmental factors or personal preferences.

The findings of this study could aid policymakers in developing programmes to change attitudes, subjective norms, perceived behavioural control, and purchase behaviour in order to reduce CO2 emissions from the transportation sector and prevent additional air pollution. (Afroz et al., 2015)

With the ongoing depletion of fossil resources and price increases, a new energy source to power the car is required. Electric vehicles are being considered by India's automobile industry as a solution to the country's industry and environment. Despite countries enacting EV policies, the current market penetration of EVs is very low. The potential scope of electric vehicles in India will be examined in this article, as well as consumer perceptions of them. (Kapera, 2012)

Research Methodology -

The information was gathered from both primary and secondary sources. Customers perception about Electronic Vehicle, which was obtained using a questionnaire based on customer satisfaction, customer behaviour, and customer response. A total of 65 people took part in the survey were chosen. A structured questionnaire containing closed-ended and open-ended Questions was created. The questionnaire's questions span all areas of study. Our target audience was a mixture of students, office workers and businesspeople, individuals on the go. Secondary data was gathered from a variety of sources, including scholarly journals and social media, newspapers, and pages. The data acquired by the survey was interpreted using descriptive analysis questionnaire.

Type of research - Quantitative Research:

This research is a quantitative research study because it attempts to measure the use of digital payments for banking in India. The questionnaire has a structured format.

Types of research design - Descriptive research design:

Descriptive research design is best research design which best describes. This study can be concluded as based on the facts that is in this study, problem is clearly defined, hypothesis is framed, information needed is clearly defined.

Population:

To study the population chosen is the people from India.

Sampling techniques:

To the study convenience sampling has been used a **convenience sample** is a type of non-probability sampling method where the sample is taken from a group of people easy to contact or to reach.

Sample Size: For this study 65 people responses are taken.

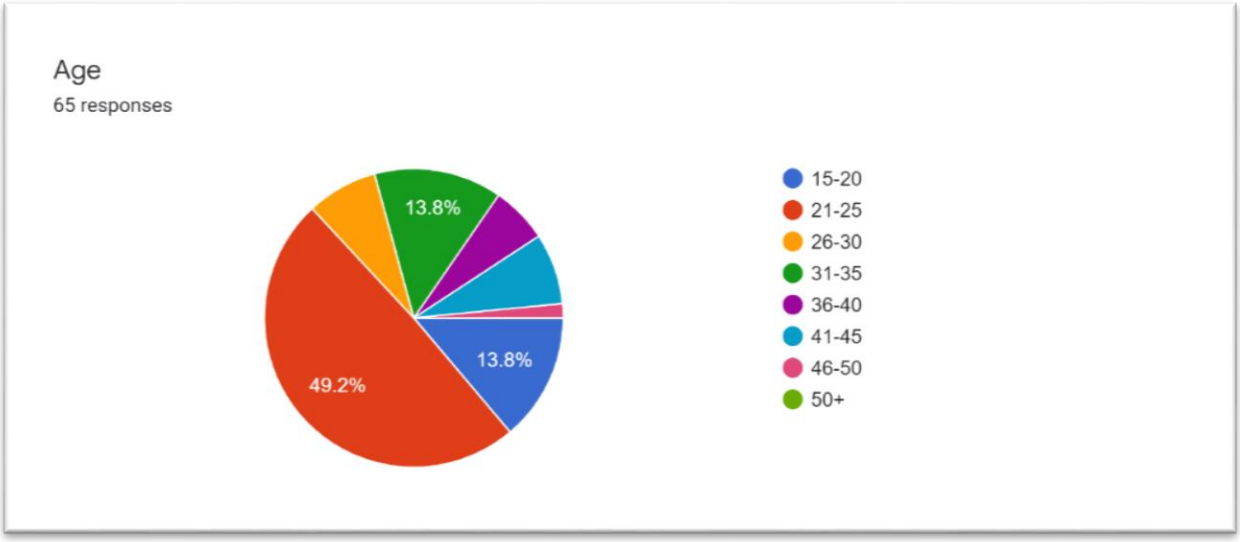
Sample Area: The area of the research is India.

Age Group: From 15 onwards

Data Collection Tool: Questionnaire

Data Interpretation and Analysis -

- The sample size is 65. 49.2% of respondents fall under age group of 21-25 yrs., 13.8% in 15-20 yrs., 13.8% in 31-35 yrs., 7.7% in 41-45 yrs. and in 26-30 yrs., 6.2% in 36-40 yes. And 1.5% in 46-50 yrs.



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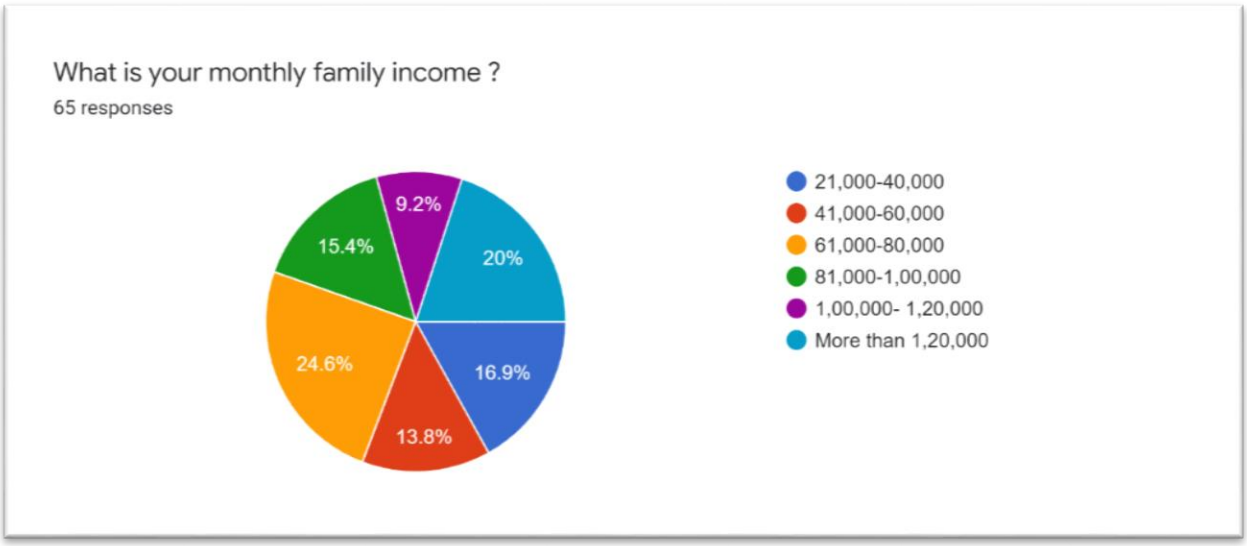
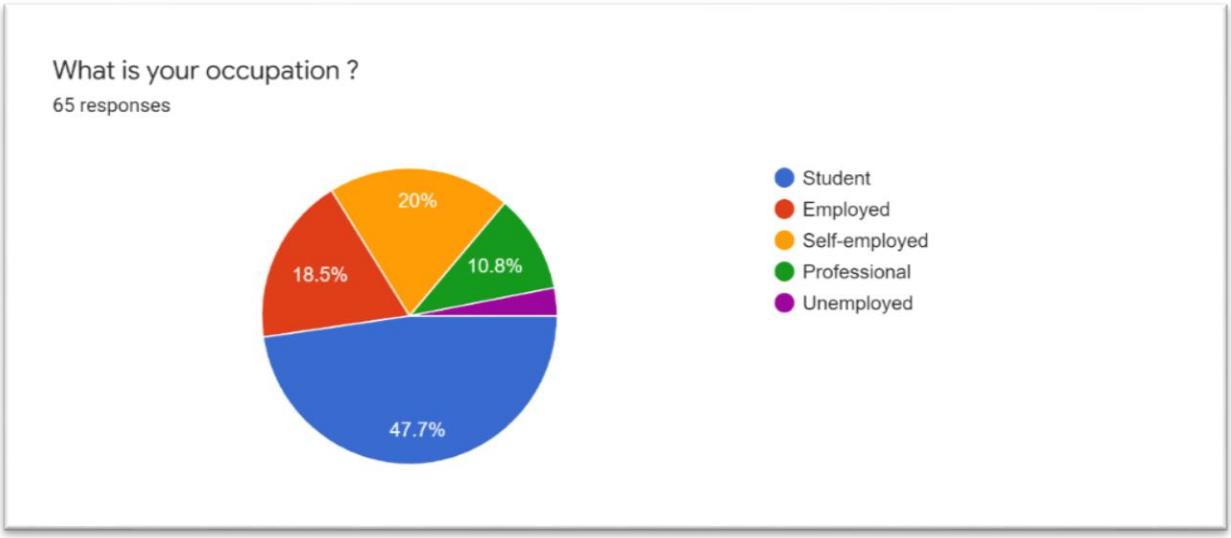


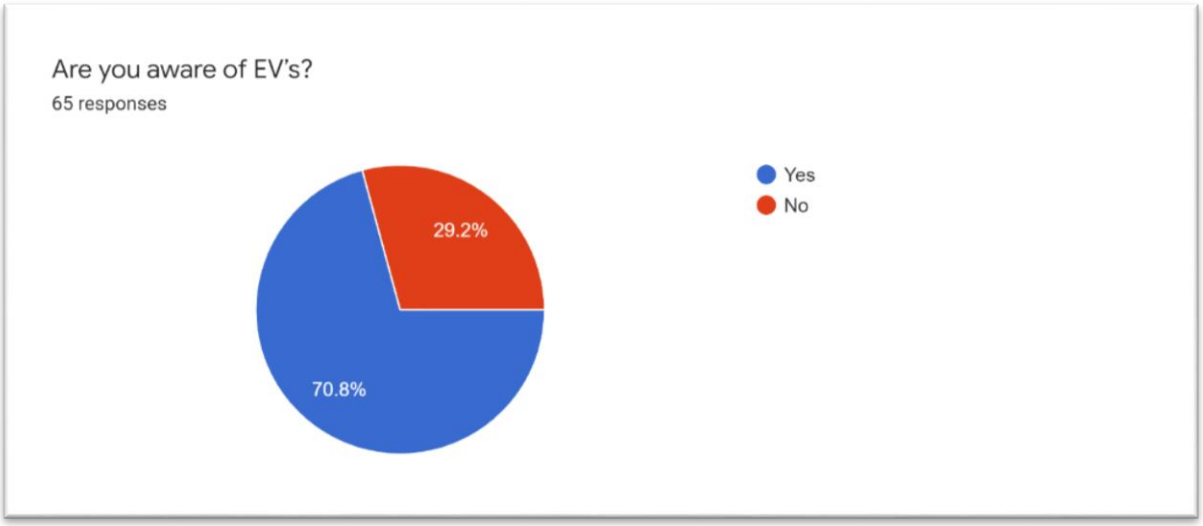
Profession of the respondents-

Profession	Frequency	Percentage %
Student	31	47.7
Employed	12	18.5
Self employed	13	20
Professional	7	10.8
Unemployed	2	3.1
Total	65	100



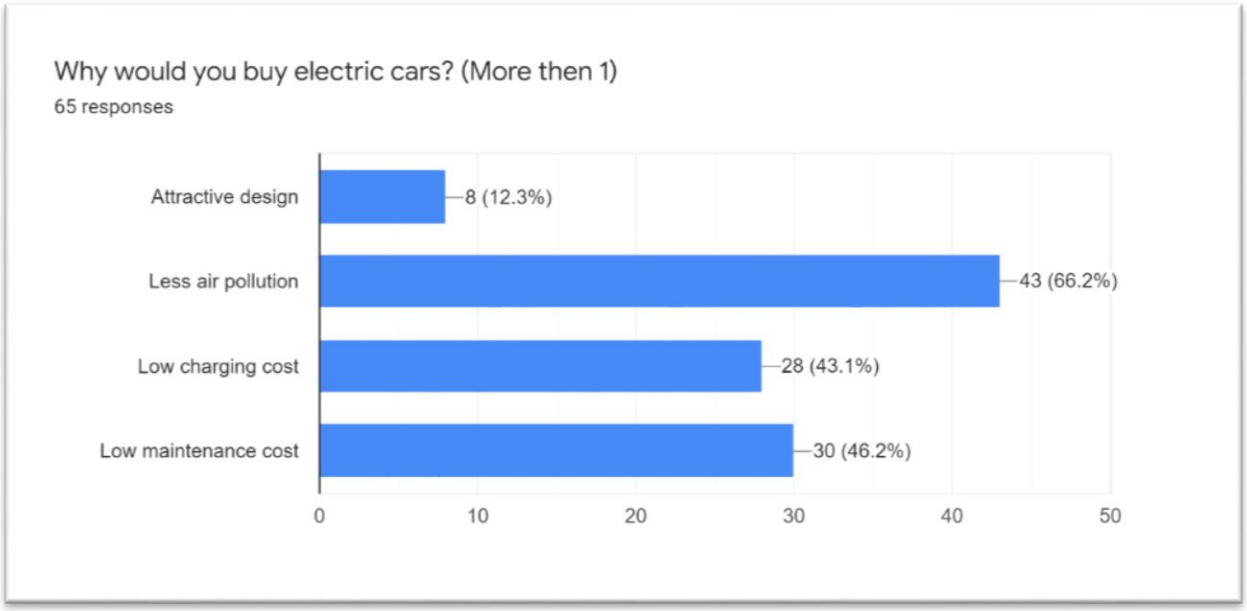
Awareness about EV's

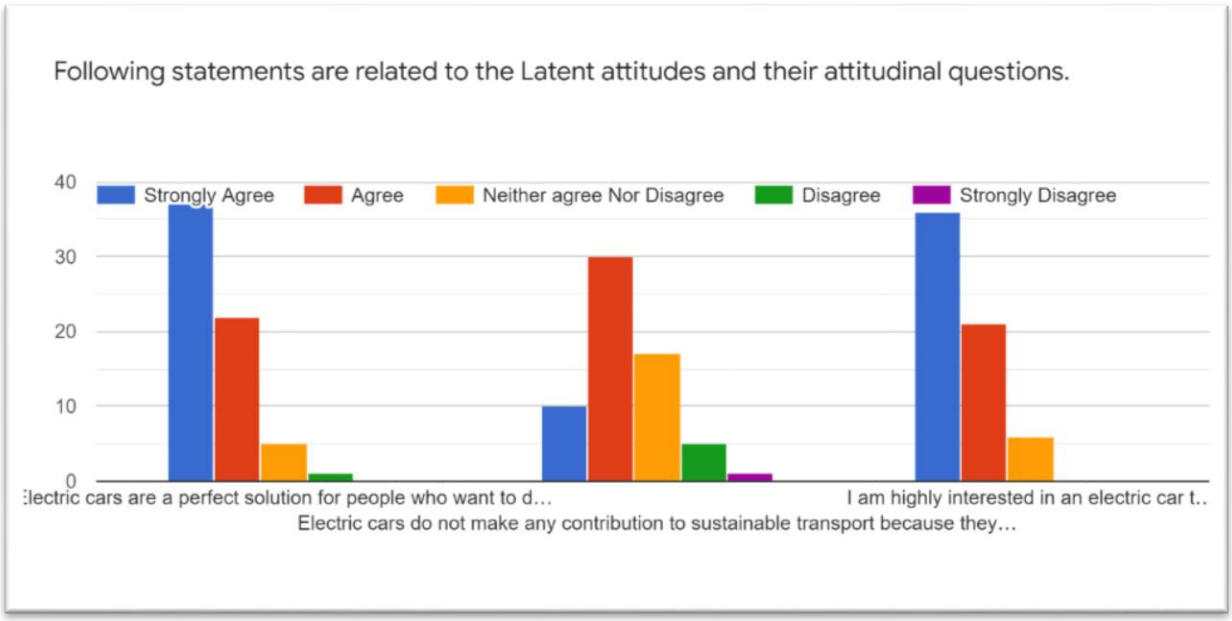
70.8% respondents are aware and 29.2% are not.



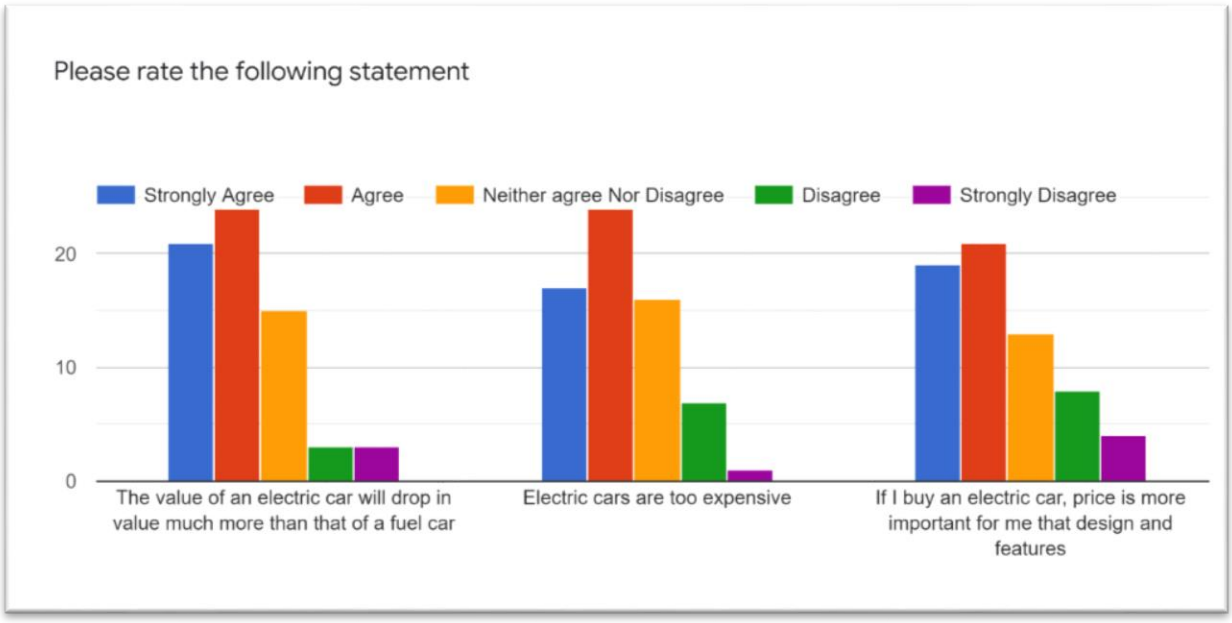
- Why consumer want to buy EV's

Most of the respondents are attracted towards less air pollution which is 66.2%, after that Low maintenance cost (46.2%), after that low charging cost (43.1%) and Attractive design (12.3%).

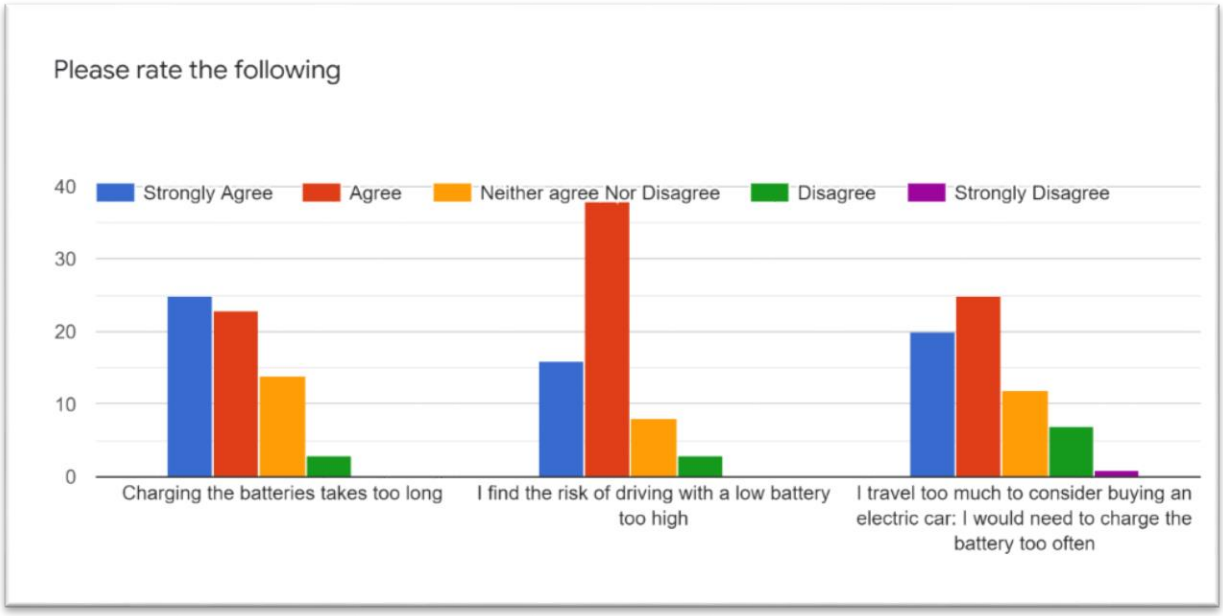




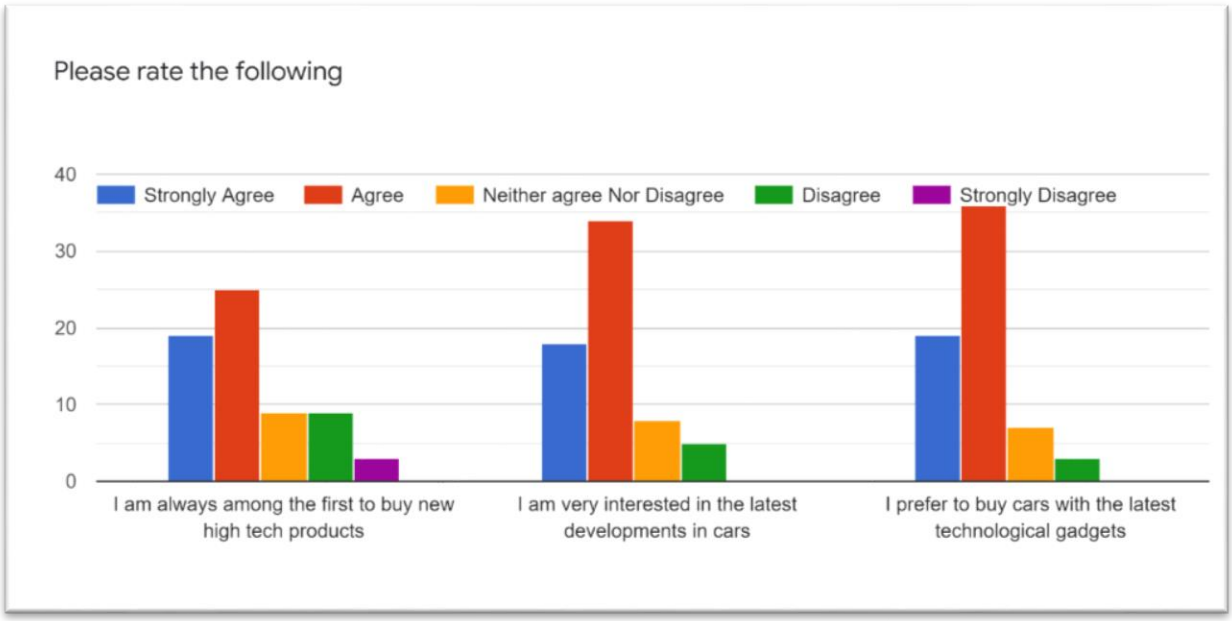
- Electric cars are a perfect solution for people who want to drive a car and at the same time wish to reduce CO2 emission – To this statement most of the respondents Strongly Agree, showing there high interest in development and adoption EV's.
- Electric cars do not make any contribution to sustainable transport because they still depend on non-green energy – Most of the respondent Agree on this statement.
- I am highly interested in an electric car to contribute to a better environment – More then 50% of the respondents are highly interested in buying electric car.



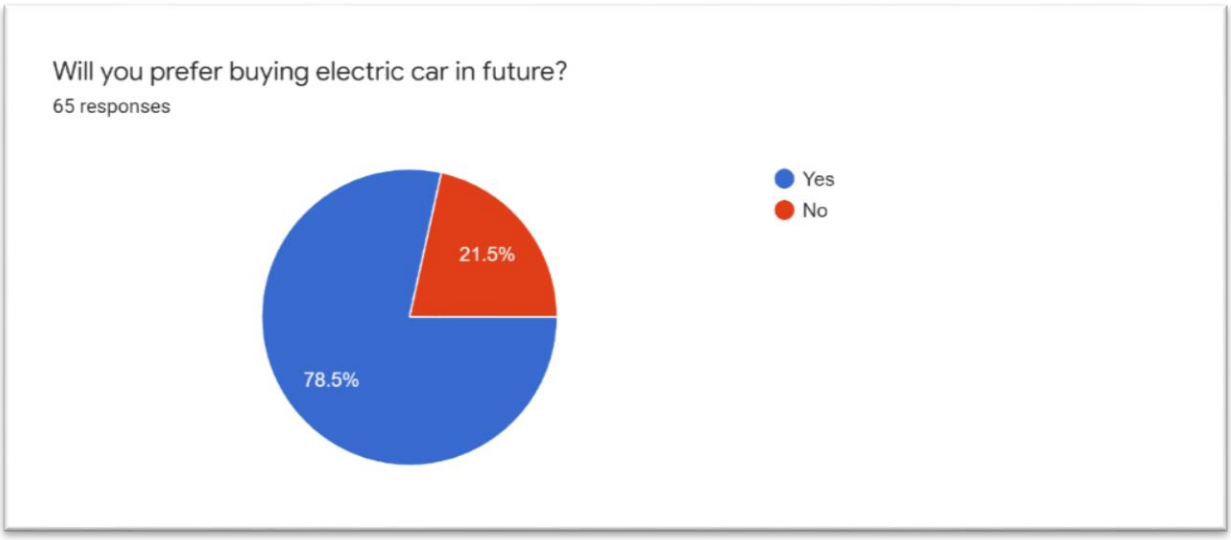
- The value of an electric car will drop in value much more than that of a fuel car – Respondents thinks that value of electric car will go down as it will become common and adoption rate will increase. Perception will shift on other thing as well on EV's once it become common.
- Electric cars are too expensive – Consumer thinks that Electric cars are Expensive.
- If I buy an electric car, price is more important for me that design and features – In this question there is tough competition, some of the consumer prefer attractive design, and some look after monetary term.



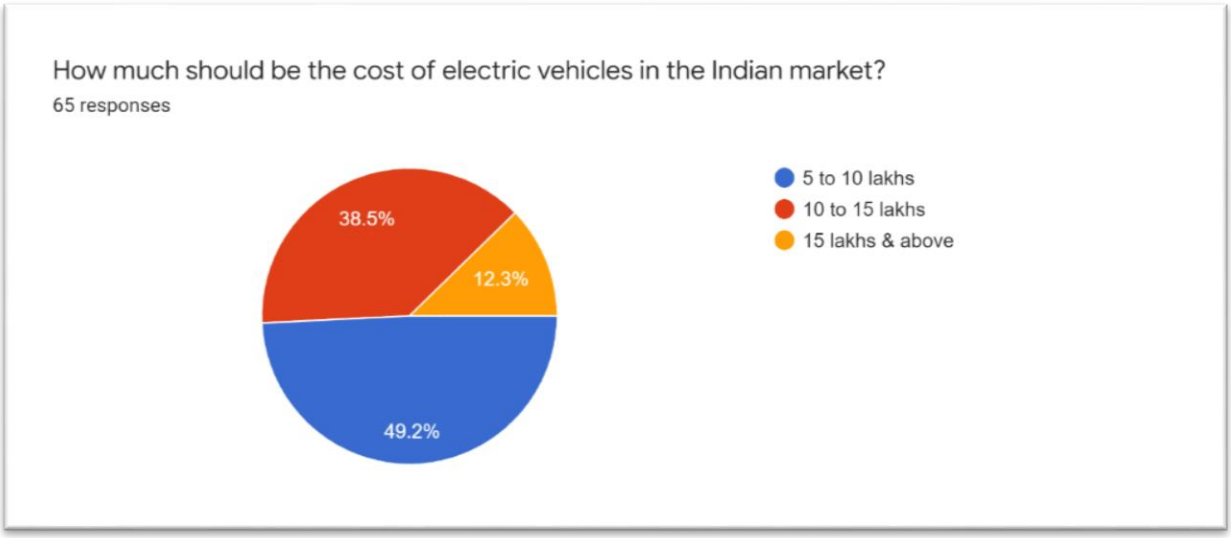
- Charging the batteries takes too long – Most of the consumer Agree with the point.
- I find the risk of driving with a low battery too high – A high number of respondents are being afraid of driving with low battery, so this can be one of the drawbacks of EV's.
- I travel too much to consider buying an electric car: I would need to charge the battery too often – Most of the consumer Agree with the point.



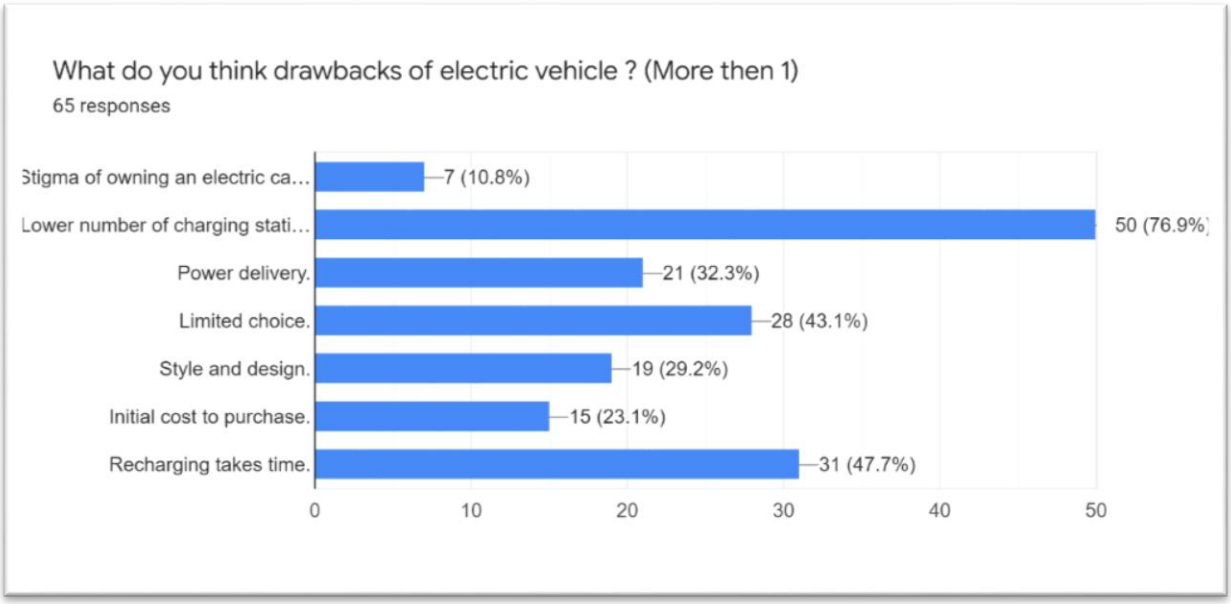
- I am always among the first to buy new high-tech products- Most of the youth respondents are driven towards developing technology.
- I am very interested in the latest developments in cars – Respondents Agree on adopting latest developed cars.
- I prefer to buy cars with the latest technological gadgets – Respondents Agree on adopting latest technology cars.



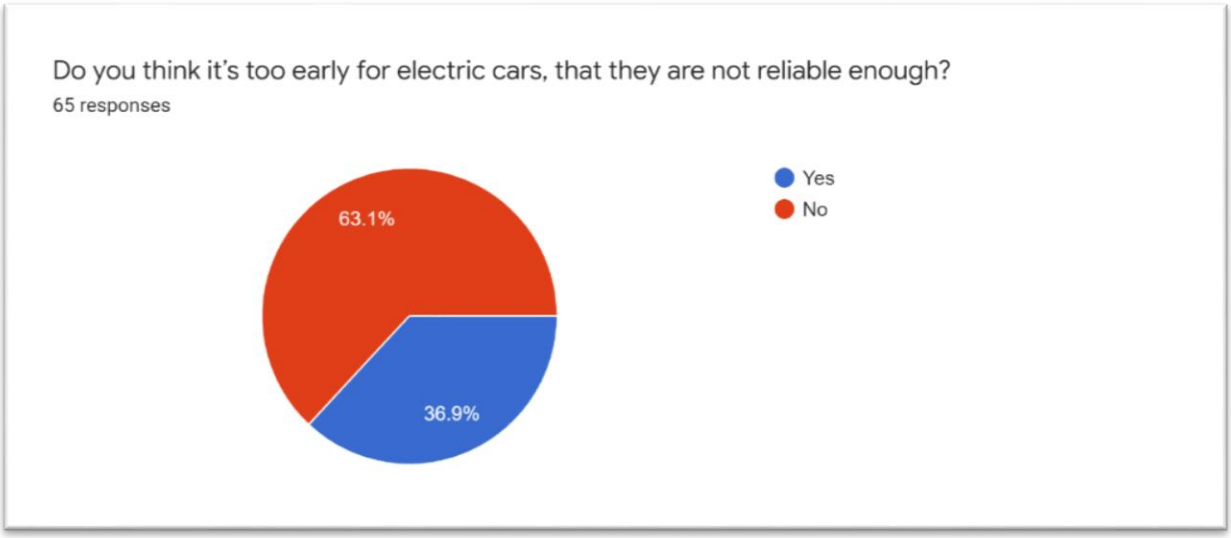
- 78.5% respondents are ready for EV's in current times. It concludes that more consumers will buy prefer EV's in coming time.



- Consumer always want more things in low cost, 49.2% of respondents thinks EV's cost should be between 5 to 10 lakhs.



- Most rated drawbacks of EV's in current time is its Lower number of Charging Station.



- Considering the current infrastructure and development of electric vehicle in India, majority of respondents considers that it's not too early for EVs to launch. As most of the consumers are making themselves aware of technology, market is adopting the positive change.

Scope

The primary and secondary data for electric vehicles in India were used in this study. Though the study discovered a potential market for electric vehicles in India, more research is needed with a larger sample size and more criteria such as battery life, speed provided by EVs, which manufacturer is the best, and what can be done to encourage more people to use EVs.

Conclusion

With the depletion of fossil fuels and constant hike in fuel prices, there is a need for energy transition in vehicles in India. Govt has taken initiative to fight pollution levels by promoting EVs and giving subsidies on purchase. To boost its production, Govt has eased the FDI norms. Various emerging brands are launching EVs in India. The Government and manufacturers should join their hands to build the infrastructure and create positive environment for EVs.

Respondents are aware of global climate conditions and are willing to switch from conventional to environmentally friendly vehicles. When it comes to purchasing an electric vehicle, price is a major consideration. With price there are many other factors also considered that is attractiveness of the car.

If sufficient infrastructure is available, respondents are willing to accept EVs as a future buying option. The initial cost of purchasing, the limited number of charging stations, and the time it takes to replenish the battery are all factors that limit consumer confidence.

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