CONSUMER PERCEPTION AND ADOPTION OF ELECTRIC VEHICLES IN INDIA

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Abstract: - *This study aims to map Indian consumer attitudes towards electric vehicles. The report covers topics such as the benefits and demand for switching to electric vehicles. And what types of EVs are already available and what are the key variables directly influencing EV adoption in a country like India? is. Through this study, the potential electric vehicle market in India is explored and consumer perceptions are explored.*

Keywords: electric vehicle; consumer awareness; consumer awareness; surroundings; automobile

INTRODUCTION

An electric vehicle (EV) is defined as a vehicle that is propelled by one or more electric or traction motors by Wikipedia. Electric vehicles can be self-sufficient by turning gasoline into energy using batteries, solar panels, fuel cells, or generators, or they can be fueled by an external power source using a power harvesting system. can advance Electric vehicles include electric spacecraft, electric aircraft, and electric boats (EV).

Midway through the 19th century, electric propulsion became one of the most popular methods for moving automobiles. At the time, gasoline vehicles couldn't compare to the comfort and simplicity of operation of electric vehicles. The third-largest highway system in the world is in India. Road transportation appears to be the primary method of transportation in India, as more than 60% of the population commutes in individual or shared vehicles.

The use of traditional cars has a big impact on air pollution and global warming. All types of vehicles produce dust from their brakes, tires, and wear from the road. The typical diesel vehicle has a worse impact on the quality of the air than the typical petrol vehicle. However, compared to electric vehicles, both gasoline and diesel vehicles emit more pollutants.

Electric vehicles are currently in demand on the market because of things like increased battery technology, governmental rules to maintain vehicle efficiency, and air quality standards. Electric vehicle use is a significant technology that can reduce greenhouse gas emissions.

It can be powered by an on-board power harvesting system or the battery itself (charged by solar panels or converted from fuel to electricity by a fuel cell or generator). sometimes). Electric vehicles have the lowest operating costs because they have few moving parts that require maintenance. They also use little or no fossil fuel (gasoline or diesel) and are very environmentally friendly.

This vehicle is intended as a replacement for today's automobiles. It can be used to address issues such as pollution, global warming, and the depletion of natural resources. The electric car concept offers a clear solution to the environmental problems of petrol cars. This survey is being conducted to find out how people feel about electric vehicles. The aim is to reduce vehicle pollution by switching to electric vehicles.

India's current situation indicates that it is time to switch to electric vehicles. The dollar appreciates in international markets as gasoline prices soar. Ordinary men with low incomes and small cars find it very difficult to cope. If you're obsessed with your car, you can't afford petrol or diesel, especially in urban areas. Some time ago, people bought diesel cars when the price of diesel was still quite low.

In order to accelerate the adoption and manufacture of electric vehicles, the government is adopting the National Electric Mobility Purpose Plan (NEMMP) 2020 as its national mission statement and road map. The initiative intends to increase the nation's fuel security, offer accessible, eco-friendly transportation, and allow India's automotive industry to take the lead in global production.

OBJECTIVES OF THE RESEARCH PAPER

○ To investigate what motivates people to purchase electric vehicles.

○ To comprehend the various Indian government initiatives for electric vehicle transportation. ○ To ascertain the general forces and impediments that stand in the way of consumers adopting EVs.

○ To draw attention to the advantages of electric vehicles in India.

○ Impact of demographic, age, gender, income on consumer perception

Literature Review

Advances in Consumer Electric Vehicle Adoption Research, Zainab Rizwani, Johan Jansson, and Jan Bodolin (2014) It talks about testability, compatibility, complexity, observability, relative benefits, and the effect of EV on observability. We have investigated and examined a wide range of adoption-related factors. The decision to buy an electric car is influenced by a range of behavioral, emotional, and other factors. Driving an electric vehicle is linked to introspective feelings like self-image and identity. Other feelings like joy, happiness, and pride are also thought to influence EV purchases. The adoption of electric vehicles will be significantly influenced by innovation, self-identity, lifestyle, and green innovation. Electric vehicles are viewed as an environmentally friendly innovation with the potential to lessen environmental concerns in the transportation industry, according to a number of consumer acceptance studies. But some customers might be unaware of or dubious about the potential environmental benefits of electric vehicles.

Dr. RenuVashisth and Ms. Jyoti Gupta (both from (2021) We calculated this for EV using statistical techniques and graphics. Use the ANOVA test with one factor. In addition, a few consumer factors are considered, along with how these attributes create perceived barriers for drivers and EVs. through it. They claim that India has the fifth-largest automotive industry in the world, and that it will overtake China by 2030 to take the top spot. It is unsustainable to rely solely on conventional, fuel-intensive mobility to meet domestic demand, which is enormous. The capacity of Energy's manufacturing is about 110,000 motorcycles per year. Leading Indian engineering, procurement, and construction firm Sterling & Wilson Pvt. GmbH (SWPL) has announced its foray into the country's market for electric mobility. fifty signatures On April 1, 2021, a joint venture with Enel X will launch and Create Innovative Charging Infrastructure in India.

Manish Sidhpuria, V.V. Ravi Kumar, and Anil Khurana (2019) In earlier research, range anxiety is the biggest barrier to EV conversion is the shortest cruising range on a full charge. Infrastructure characteristics emphasize the presence of a charging infrastructure. An analysis of this factor's positive effects. A quality charging station reduces consumer range anxiety and saves time and money. In India, EV adoption is scant, and most people have no prior EV experience. Although they cost more up front, electric vehicles are relatively cheap to run and maintain. This is comparable to vehicles powered by internal combustion engines that have high operating costs. Adoption's response to perceived economic benefit (PEB) varies. People who care about the environment and saving energy are more receptive. Electric vehicles are uncommon on Indian streets and are not widely available in the market.

Rajeev Ranjan Kuma and Kumar Alok (2020) The literature covers a wide range of EV adoption-related subjects, such as research-based studies (Lieven, 2015; Adnan et al., 2018; Sova cool at, 2019), optimization methods, and drivers (On at et al., 2016; 2018). contains the Skippon et al. (2016), Berkeley et al. (2018), among others, have collected data and performed secondary data analysis (Sierzchula et al., 2014). National policies and ecosystems are also illustrated in the literature. According to the findings of this study, EV adoption is challenging and calls for a comprehensive ecosystem approach to identify all important factors at various levels. The development of realistic policies and rules that would promote the conversion to EV while enriching the academic environment depends on such thorough investigations and assessments.

Sumukh S. Hungund, Mabel Fernandez, Lidwin Kenneth Michael, and Sriram K.V. (2022).

India needs to maintain its position as the market leader. Consumers are quickly emerging as a competitive alternative to fossil fuel-powered vehicles like gasoline and diesel due to growing environmental concerns about fossil fuel depletion and greenhouse gas (GHG) emissions. We are investigating electric vehicles (EVs), which provide access to what we see as a workable replacement. combines well.

This white paper's goal is to investigate potential elements that may affect consumers' inclinations to adopt EVs. The Indian government has created a laudable and ambitious path for all-electric cars. By 2030, it provides ground-breaking options for shared and networked electric mobility that might electrify all private vehicles and all public transportation (SIAM, 2017).

This goal must be broadened to enable a future of fully electric mobility by maximizing the use of electric vehicles. This study aims to uncover factors that might affect the adoption of EVs, provide governments with the appropriate guidance, and help automakers better understand the needs and preferences of their customers. The difficulty the country is currently facing is that in order to accomplish this goal, appropriate market research is required.

The three main types of electric vehicles are battery electric vehicles (BEV), plug-in hybrid electric vehicles (PHEV), hybrid electric vehicles, and self-driving (electric) vehicles. As India strives to rebuild its automotive industry with a strong focus on electric mobility, it is imperative to fill the knowledge gaps brought on by a lack of awareness of potential barriers to the adoption of electric vehicles.

Marija Bockarjova, P Rietveld, and JSA Knockaert (2013) We examined electric vehicle preferences based on a generalized operating cost approach that includes both monetary and nonmonetary costs of vehicle ownership. Using his positive WTP estimate for hybrid vehicles (about €900 on an annual basis), the subsidy for hybrid vehicles would be reduced to an average time value of €63 per hour for each subsequent consumer segment. I understand. Show this time. The environmental cost of

CO2 reduction is estimated at €160 per ton, well above the market average, but the choice of EV will be decided at a later stage of deployment. Finally, the trailer potential is estimated at an annual average of €540, which is roughly the same for all consumer segments in the introduction phase. The average purchase price of an electric vehicle is approximately 150% higher than a comparable conventional fuel vehicle. Combinations, EVs, EVs vs. conventional vehicles, two key consumer attributes, functionality, and unanimous trade-offs on price (e.g. 50 km mileage is 6% cheaper than comparable conventional vehicles)) Disadvantage due to high initial cost of electric vehicles

Franchao Liao, Eric Molin, and Bert van Wee (2016), Ev. and the decision-making process. The adoption of EV, either through the promotion of EV credits or supporting frameworks (such as the fee framework), and separate decision-making studies used in financial audits, are more likely to help assess the adequacy of these arrangements or procedures. Makes sense. All studies found that purchase price has a very large negative impact on the utility of electric vehicles. Policy incentives aimed at promoting the replacement of electric vehicles with CVs may have the unintended consequence of increasing the number of vehicles in the home.

Anil Khurana, V.V. Ravi Kumar, Manish Sidpuria (2019) It turns out that EV adoption in India is only superficial and many overlook the experience of EV maintenance. The initial cost of EVs can be high, but ownership and support costs are typically low. Certain beliefs, social and personal norms, and design intent, ratings, and use of EVs (e.g., ATT) for acceptance of cleaner vehicles influence adoption intent. Electric vehicle preferences will continue to evolve as technology advances, increasing awareness, adoption, and SoCs**.**

Jashandeep Sing and Ramdeep Singh Arneja (2022) In the general perception and purchase of electric vehicles in the Indian state of Punjab, according to the popularization of innovation theory, the acceptance of innovation is a very slow process, requiring many stages before concrete procurement or use of the innovation. I discovered that Willingness to Adopt When you think a new technology will help you, the willingness to adopt Ev arises. The study also identifies consumer differences in developing EV cognition based on demographic and other variable cognitive factors, such as daily range and type of vehicle currently being driven. Governments of India and other countries have initiated and implemented measures to encourage and facilitate the production and adoption of electric vehicles.

Valerian Geni, Anupama Unnikrishnan and Karlskrona (2021) This dissertation was submitted in part to fulfill the requirements for a master's degree in Industrial Economics and Department of Management, Faculty of Business and Economics, Blekinge University of Technology. The cost of the paper is 15 ECTS units. The market for electric vehicles (EVs) has increased over the previous ten years, going from nearly nothing in 2010 to over 3 million units in 2020. This market, which was once seen as a niche one, is now quickly gaining widespread acceptance. In this context, numerous scientists have tried to pinpoint and classify the key elements that affect the uptake of electric vehicles. Its goal is to give a summary of the important elements that scientists have discovered during the past ten years.

A cross-document analysis is also included to identify the benefits and drawbacks of the pertinent study. This analysis's objectives are to outline recent research and suggest new study areas. Thanks to ongoing research, scientists have been able to correctly identify the key factors influencing the adoption of electric vehicles. More current research, which has also added more complicated psychological elements to the list of previously recognized ones, has essentially validated the findings of prior investigations. Time changes, geographic characteristics, incentives, and vehicle segmentation may all have an impact on some of the previously stated variables.

Tek Tjing Lie, Krishnamachar Prasad and Ning Ding (2017) Electric vehicles (EVs) are still being researched as a potential means of reducing the greenhouse effect. Plug-in hybrid electric vehicles (PHEVs) provide comparable range and fuel economy in comparison to vehicles powered by internal combustion engines (ICEs), in part because of enhanced power electronics, energy storage, and support systems. Use either optimum control strategies or the principles of energy management systems (EMS). It has the potential to greatly raise PHEV efficiency. In this overview document, the main electric car workflow types are discussed. Additionally, the technologies of batteries and supercapacitors are considered as a way to increase the power density of PHEVs.

Shinu P. Jose, Siji Cyriac, and Binu Joseph (2022) We conducted research and identified a number of elements that affect consumers' favorable perceptions of electric vehicles. Significant obstacles to EV adoption and acceptance also exist in India. He suggests educating people about how environmentally friendly electric cars are. This aids in the manufacturer's financial success. The use of fossil fuels will decline with the introduction of electric vehicles. EVs offer a variety of opportunities, but there are a number of conditions that must be met before a driver can consider their EV to be a dependable mode of transportation. The three main categories of influencing factors—demographic, situational, and psychological—were each separately examined. Additionally, flaws and deficiencies in recent research were highlighted.

Mr. Omkar Tupe, Professor. Svetlana Kishore and others. Alf Zombier (2020) It explored consumer perceptions of electric vehicles in India and concluded that electric vehicles are one of the most viable alternative solutions to the crisis. Several auto companies are introducing electric vehicles and expanding their portfolios. They looked at the differentiators to better understand the perception of EVs in the Indian market and the factors that influence customers who decide to adopt EVs. Most respondents considered performance, fuel efficiency, price, technical features and environmental friendliness to be the most influential factors, while style, size and brand were moderately influential. I was evaluating it as a factor. They also said the government and manufacturers need to work together to promote EV acceptance among the general public.

Lucy Maybury, Patrick Corcoran, and Liana Shipigan (2022) Agent-based modelling and discrete choice modelling are the two most used modelling approaches. Adoption of EVs continues to be significantly hampered by the lack of a viable business model. Electric vehicles represent a technological shift. This means that it represents a significant technological advancement in the manner that social processes related to transportation are carried out. Examples of this advancement include "changes in user practices, legislation, industrial networks, infrastructure, and symbolic significance." modifications besides (Geels, 2002).

A change in the behavior of the population is needed because a change in technology requires a change in user practices. Range anxiety (fear of vehicle range) is prevalent among potential EV users and is a major barrier to EV adoption. In particular, range anxiety refers to the vehicle not having enough range to reach its destination. In particular, this is relevant for battery electric vehicles (BEVs) that are used for long trips that may exceed the range of the vehicle. In this study, in the form of a systematic literature review (SLR) he provides a detailed overview of existing work on the mathematical modeling of EV acceptance.

Makena Kaufman, Paul Bernstein, and Cheryllyn Bee (2016) Electric vehicles (EVs) have recently made a comeback on the international automotive scene. This performs better and has a longer electrical range than its predecessor. In a short amount of time, electric vehicle adoption has been impressive, but the majority of the government's objectives have not been reached. This article offers a summary of the expanding body of peer-reviewed research analyzing the variables affecting EV adoption.

For battery electric vehicles in particular, public charging infrastructure can solve a number of issues, but there is little advice on how to best supply this infrastructure to governments. Last but not least, the research is mostly focused on fictitious situational studies due to the growing electric vehicle market. There is ample proof that customer preferences are vastly outpaced by actual purchases. For more insightful studies of EV usage over time, a deeper comprehension of this discrepancy between perceptions and behavior is needed.

RESULT ANALYSIS METHODS

Research Approach:

Descriptive research will include primary and secondary sources.

Data Sources:

Primary survey:

Data have only been obtained from original sources, digital internet surveys conducted using Google forms, or in-person surveys conducted by individuals.

Data Gathering Technique:

Primary research technique **Population:**

The age range of Phagwara city's target market is 15 to 35.

Sampling Technique:

60–70 Responses were randomly sampled.

Sampling Frame:

Sampling framework via Google Forms provided to various pg students in our area. Convenience sampling is used for data collection because questionnaires are a suitable method for opportunistic sampling. Respondents are electric vehicle customers. Electric vehicles have relatively few customers. A convenient sampling method is therefore a good option for reaching respondents.

Data collection method

The questionnaire is mainly used to identify customer attitudes towards electric vehicles, factors in favour and against it, and factors that determine customers' environmental awareness when purchasing an electric vehicle.
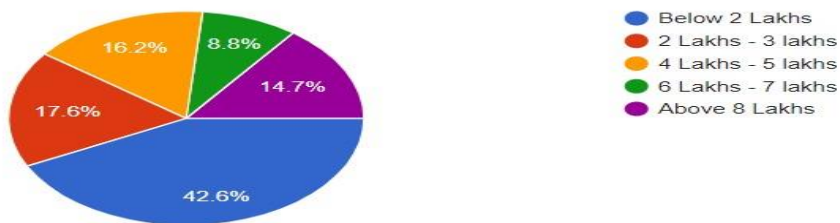
DATA ANALYSIS AND INTERPRETATION

1)
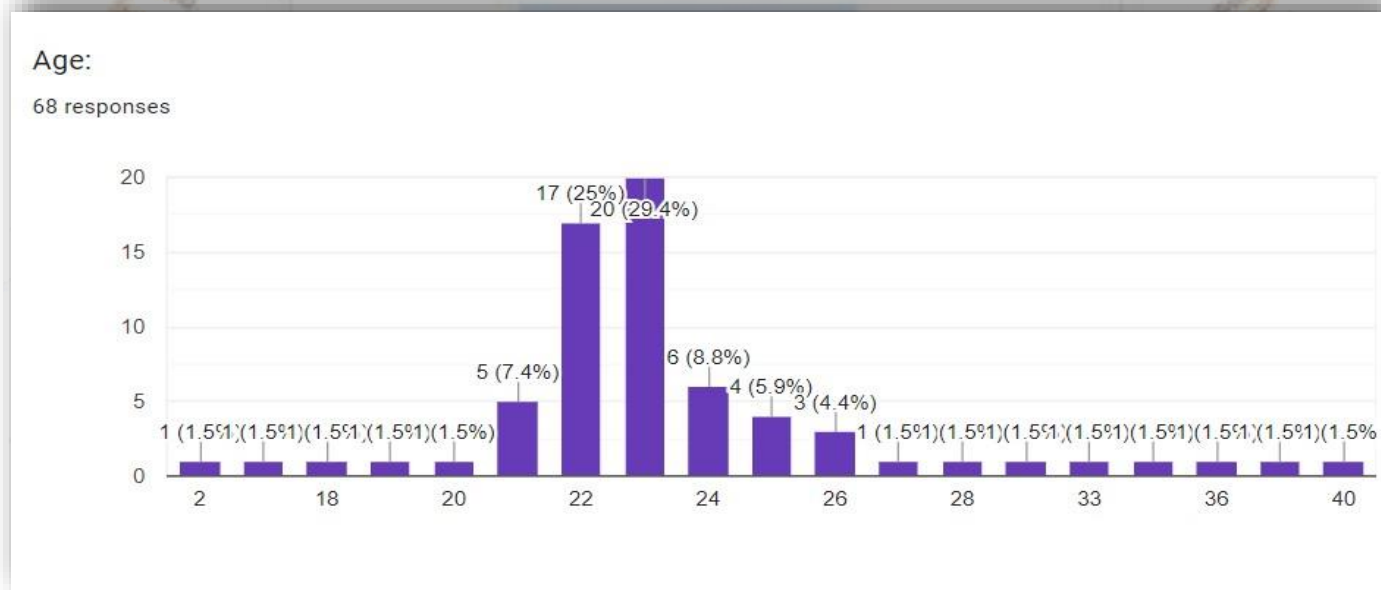
Interpretation:

The graph above depicts the number of people who responded to this EV survey, with the majority of those who responded being between the ages of 22 and 23. Being a young person, cheaper modes of transportation are preferred.

2)

Interpretation:

The illustrative graph above shows that the highest number of respondents are earning their income below 2 lakhs, which counts as 42.6%, and the lowest will be 6 lakhs–7 lakhs, which counts as 8.8%.
3)

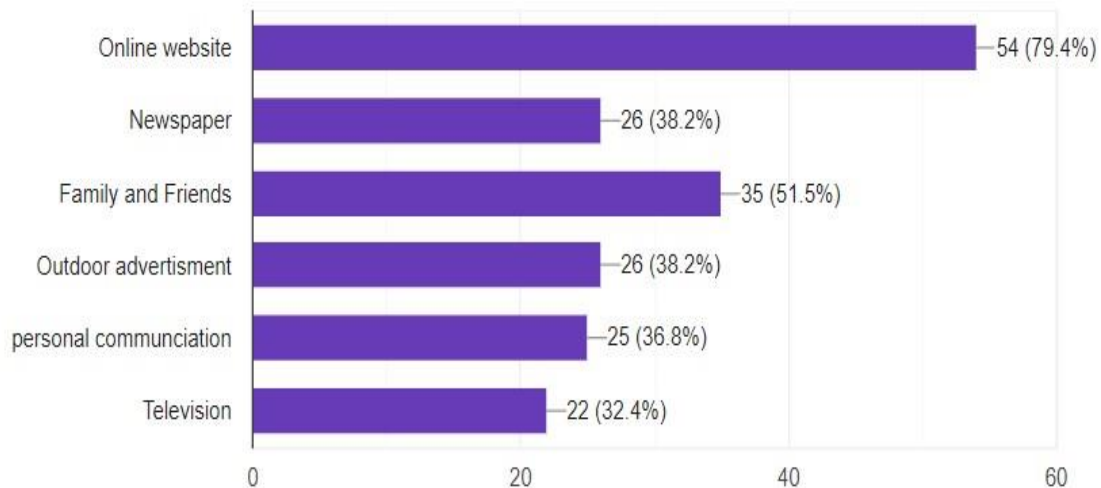Have you ever heard about electric vehicles ?

68 responses

100%

● Yes
● No

Interpretation:

The illustrative pie chart shows that the majority of respondents heard of electric vehicles in one way or another, so it is good that the future generation knows so much about EVs. **4)**

If yes, from where did you get to know about electric vehicle ?

68 responses

Online website	54 (79.4%)
Newspaper	26 (38.2%)
Family and Friends	35 (51.5%)
Outdoor advertisment	26 (38.2%)
personal communciation	25 (36.8%)
Television	22 (32.4%)

Interpretation:

A. According to this graph, most people learned about EV from an online website, which accounts for 54%, as it has the greatest reach of any factor. As you can see, we are experiencing a modern development in the world of awareness shift.

B. Newspapers also play an important role in disseminating information around the world; older people read newspapers more than they do on the internet.

C. Information from people is always the first notification one can get, and information from groups or individuals travels a lot faster than any other.

D. Advertisements create a lot of awareness about the products; they also help to lure out information and categorize it as an important topic. Companies use it as their most important tool to let the world know about them.

E. Television is still the most reachable unit in rural areas. It helps the people the adequate information through company advertisements. It is important for agencies to promote their products and let people know about the information.

Live Examples:

1. Companies make visits for the people to help them understand the products and the values. This helps them to promote the products to different people at the same location, a time conserving method.

2. Free trials are also given in order to let people look to the product and help them to understand the functions.

3. Advertisements Hoardings are placed all over the cities in order to build up a mindset in people so that they search about the details and information regarding the same.

4. To increase awareness of electric vehicles among the public and help them comprehend their importance in the near future, Tesla recently launched an event to promote EVs in urban areas.

5. Also, we can take one more example as Tata use their image to promote themselves in the market which will help them to make more purchase by public as brand helps to make more purchase as people have trust in them.

5)

What are the electric cars that you know ?

68 responses
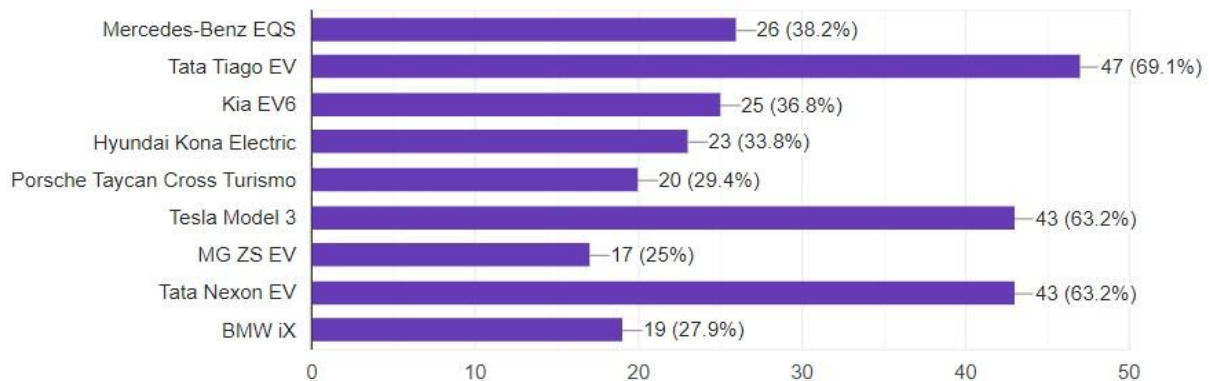
Interpretation:

1.   From this graph you can see major number of respondents know about Tata Tiago EV which scored about 47% so u can see that their promotion will be more than other of the brand, or their will be other factor which helped them to gain more Percentage.

2.   The least Percentage was in MG ZS EV which consist of 17 % so we can say that their strategic was not good to tata Tiago because they were not focusing on the market promotion as well as good relationship with foreign market.

3.   Tata was they name which was know to everyone in the electric vehicle segment as people want to make more purchase of domestic car which is Tata Tiago.

4.   These graphs also showcase that Tata was having more variety of Electric vehicle compared to other EV in the Indian market.

5.   Also, from these graphs we can say that in Indian market other than Tata was Tesla which was Expectational good as they have technological advancement with future model in their car which they people are liking in current time.

6.   Tesla has a greater advantage to other car because of lower maintenance, environment friendly and as well as they a very good performance compared to other foreign companies in the Indian market.

7.   From these graphs we can say that they number of EV in India is increasing because of more competition in the market so they companies will make more serious advancement in their product to through different USP and future model.

6)

How important for you is someone's advice regarding the choice of a cars particularly electric cars ?

68 responses

- Not important at all ,I rely on my own knowledge
- I will take into consideration opinion of my family and friends
- I will take into account advice of professionals
- I will pay attention to every suggestion I can receive

Interpretation:

1. From this pie chart a major number of respondents are agreeing to that they will pay attention to every detail they will get regarding EV

2. A person's advice is essential to a buyer as it generates an idea of the particular product that they intend to buy in the near future. A person having earlier experience on the product can help us to understand the pros and cons which can help the buyer to develop a certain mindset.

3. Advice from professionals is important as they have more experience in the field and it generates a certain dependency for the buyer to move forward with the buying.

7)

Which vehicle would you prefer ?

68 responses

- Electric Bike
- Electric Car
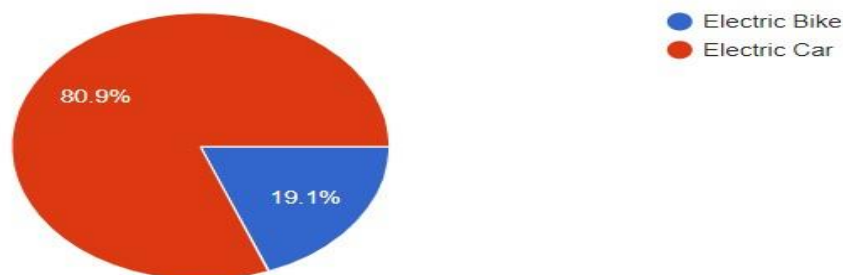
Interpretation:

From this pie chart you can see that majority number of people want Electric car which cover 80.9 % rather than Electric bike 19.1%. Cars are more subjective to people due to safety reasons as compared to bikes.

8)

If you wanna buy E-vehicle, which company will you prefer?

68 responses

- HYUNDAI
- MARUTI SUZUKI
- MG
- TATA
- OTHER
- Tesla
- Tesla
- Mahindra belero
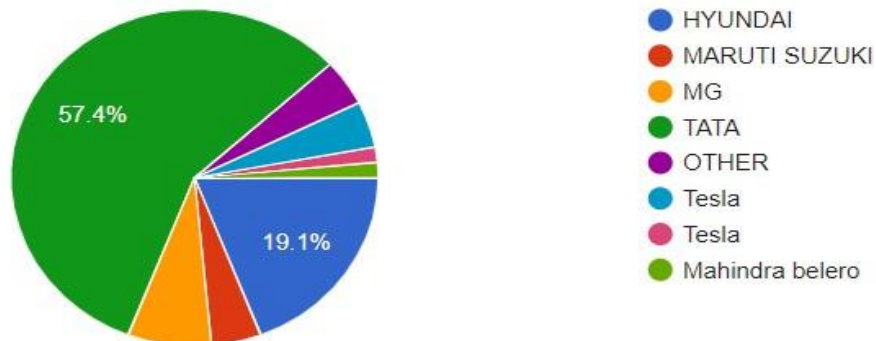
Interpretation:

A. From this pie chart you can see that large number of respondents are opting to Tata as their preferred Electric Vehicle that is why they have large number of % which is 57.4 % and the least opted brand is Tesla and Mahindra bolero.

B. Most companies are held back due to the mindset of people in order with TATA. Being an old and trustworthy company TATA holds a special place in the residents in India. The services provided by them are overall much higher compared to other companies.

C. TATA holds the term reliability, and it helps them to communicate with the buyers.

9)

Which factors encourage you to buy E-vehicle?

68 responses
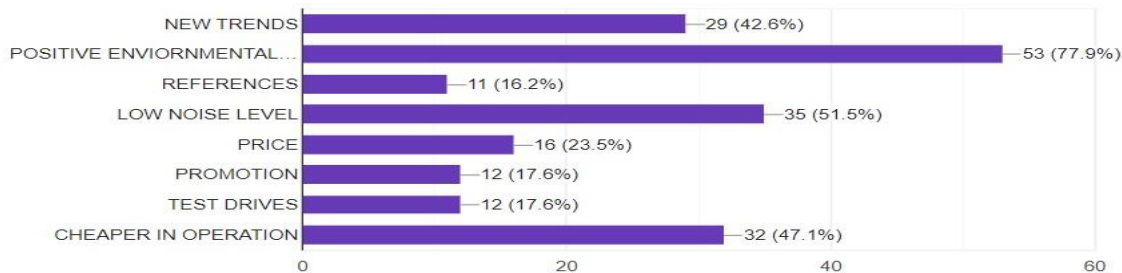
Interpretation:

A. From this bar chart trend, you can see that majority number of people opted to buying E-vehicle they factor which motive them is positive Environmental as u can see regular car make lots of air pollution as well as noise pollution which is harm for our health so that is why they are taking 53% as E- vehicle are chose because the promote greenhouse.

B. Compared to diesel and petrol cars, an EV is much more efficient towards the environment. As resources are being depleted at a higher rate people should tend towards Electric Vehicles.

C. EV vehicles tend to have lower car noises and help to comfort the environment around it.

D. Prices play an important role as it segregates the market into segments, EV tends to have higher prices due to the parts prices.

E. From this bar chart, References is the least encouragement to electric vehicle which consists of 11% they main reason is because of people first want to see physical and want to know about they feature in present time.

F. Also, from this graph we can say that people buy electric cars because they are cheaper to operate compared to normal car.

G. The low noise level which consists of 35 % in the graph tells us that conventional vehicles make more noise which will impact on our noise pollution.

H. Also, they knew trends which consist of 32 % which state that the trend impact hugely on youth as major number of people from future generation.

I. Also, from these graphs we can say that the future generation are adopting because EV are no harm to nature compared to normal vehicle (diesel and petrol).

J. People have different opinions about purchasing but the real impact which make people buy is the cost efficiency and cheaper to operate.

Live Example:

Like in recent time Companies are trying to set up more of recharge units in cities in order to promote EV vehicles and help the customers for ease. Consumption of fossils can lead to depletion of resources as for example: Petrol.

10)

Drawbacks of an an Electric Vehicle ?

68 responses

Interpretation:

A. From this bar chart you can see majority number of percentage goes towards is lower number of charging station as it takes lots of money as well as hell lots of customer that is why they are taking 48% Least number of percentages goes towards is style as people don't look style in consideration of not opting E-vehicles.

B. From this graph we can say that style which consist of 11 % is least drawback factor which doesn't affect that much in buying of electric vehicle.

C. From this graph we can say that Re-charging is inconvenient (39 %) and Re- charging takes time (37 %) is one of the major drawbacks which make people not to buy electric vehicle.

D. One of the major reasons which people are not buying electric vehicles is that there is limited choice of selection in the company to buy.

E. Many people are not able to afford an electric vehicle because it is very costly. As we show in the chart the initial cost of EVs is more only less people are affording it with the response of 30.9%.

F. Also, from the graph you can see that power delivery which consists of 30% also makes one of the major drawbacks in regarding to not purchasing of electric vehicle as some number of people like performance driven vehicle.

11)

What do you think about following statement? Electric cars can protect from global warming ?

68 responses

- STRONGLY AGREE
- NEUTRAL
- DISAGREE
- AGREE

8.8% 25% 32.4% 33.8%

Interpretation:

I.   From this pie chart you can see that the majority of people believe that it will have neutral effect in protecting global warming so people are saying that it may affect or not in future time only 8.8% are not agreeing in this agreement.

II.   According to most people believe that Global Warming is caused due to depletion of ozone layer which occurs due to pollution from petrol and diesel cars. EV vehicles as tend to run on electricity won't harm the natural vegetation around us and help us to protect those essential natural resources.

12)

How likely that your next car will electric car?

68 responses

- I want to buy electric car as soon as possible
- I want to buy electric car during next 5 year
- I want to buy electric car during next 10 year
- I don't want to buy electric car

29.4% 7.4% 39.7% 23.5%

Interpretation:

From this pie chart you can see that large number of people want to buy electric car during their next 5 year which comprised 39.7 % so u can say that they are going on modern way which is to protect environment and say from pollution and other factor which are making our health bad day by day.

13)
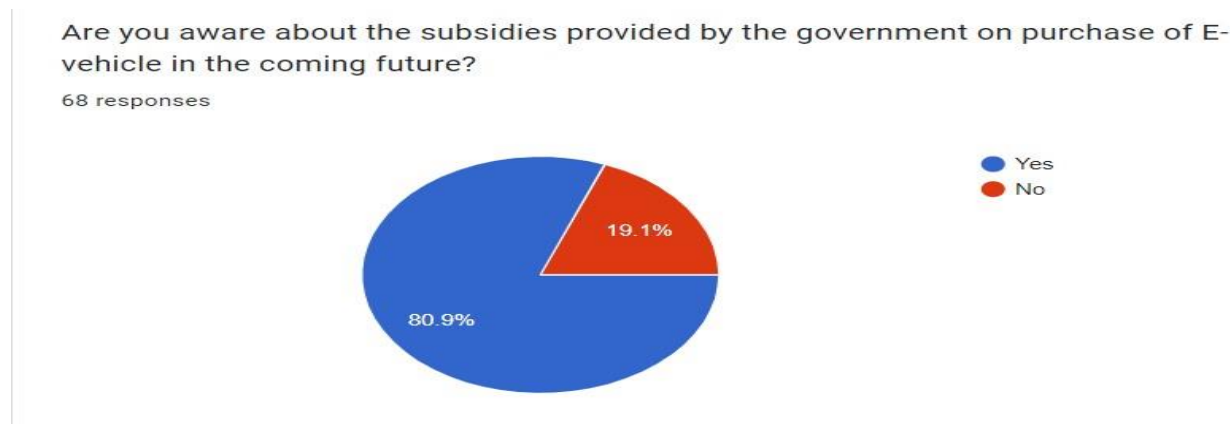
Interpretation:

A. From this pie chart you can see that majority number of people are opting yes which count as 80.9% so you can say that people are much aware about various government subsidies provided with electric vehicles so that to promote the purchase of EVs.

B. The reason behind this was to increase the sales of EVs rather than petrol- diesel vehicle to reduce the pollution.

14)
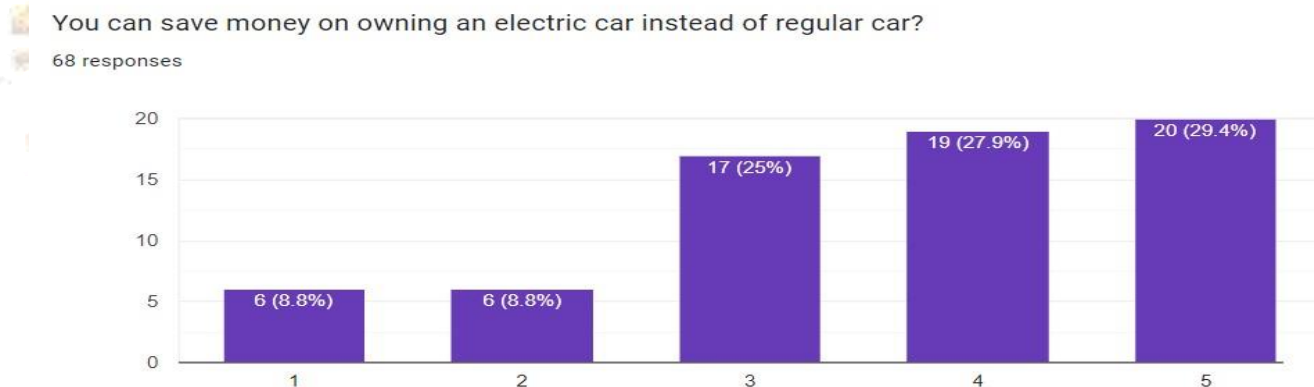
Interpretation:

From this bar chart you can see majority of people (29.4%) are agreeing that owning electric car will benefit them in long run rather than regular petrol car because electric car have environment advantages in it.

The life of electric cars is much more than petrol cars, so their residual price is also high that's the reason people prefer EVs now.

15)

A war is currently going on in Ukraine. situations like this can have an impact on prices around the world .how worried do you feel about rising fuel prices and electricity prices ?

68 responses

- 1. Not worried at all
- 2 . Worried
- 3. very worried
- 4. Don't know
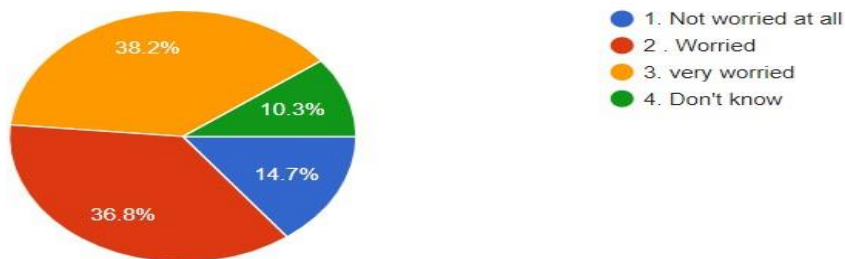
Interpretation:

I. From this pie chart you can see that major number of respondent are very worried regarding Russia –Ukraine has it is major challenging because major number of oil exporters country to the world is Russia so by sanction them we have to pay more money than required regarding so that is why it is covering 38.2% so u can say that fuel need is necessity so without people can't able to live so it very concern in current world.

II. For this reason, the demand for electric vehicles is increasing day by day all over the world.

16)

Electric vehicles have better design than the conventional ?

68 responses
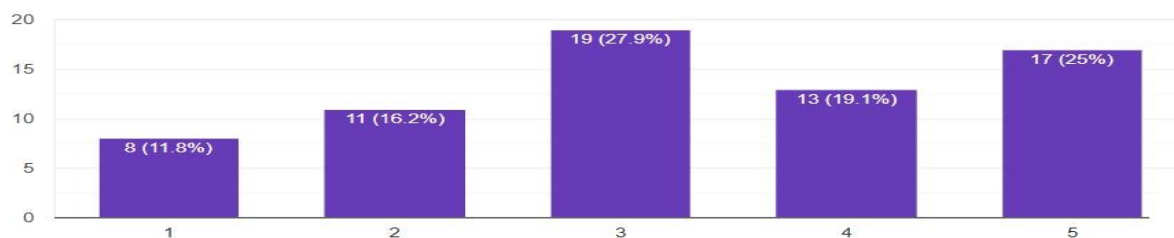
Interpretation:

1. From this chart you can see that most number (27.9%) of respondent are neutral regarding design of electric vehicle so u can say that it will not impact that much in selection of purchasing EVs.

2. The main reason behind it is people prefers quality and features of the cars rather than design of the cars.

17)

Electric vehicles can replace regular car in terms of satisfying consumer needs ?

68 responses
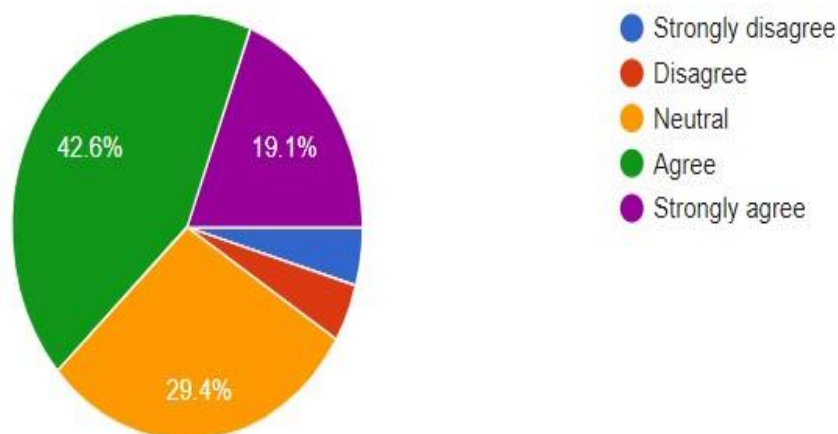
Interpretation:

A. From this pie chart you can see that major number of respondents (42.6) are agree regarding that electric vehicles will satisfying the consumer needs and they will do major impact in the future time.

B. The cost of maintenance is very much lesser than regular cars that fulfils customer need for efficiency in their livelihood.

C. 29.4% of population in the sampling is not able to make any decision early because somehow, they didn't purchase it, so they are not sure about the future of EVs.

D. 4.6% of population are disagree about the fact that EVs can replace regular cars with petrol and diesel because they prefer the older ones.

E. From this pie chart you can see that there are 4.6 % of respondents who opted strongly disagree it means that they want regular vehicle rather than electric vehicle as they liked, and they want to stick to old phase and don't want to change into new modern way.

FINDINGS

1. The majority of respondents aged 20-26 are interested in electric vehicles.

2. The majority of respondents are students and only a minority are employees.

3. Analysis shows that 32% of people have a neutral attitude towards environmental awareness.

4. According to the analysis, 80.9% of people prefer an electric car and 19.1% of people prefer an electric bike or e scotty.

5. The majority of respondents prefer positive environmental impact, low noise levels and lowcost operation when purchasing an electric vehicle.

6. According to the analysis, 54% of people prefer online sites, 35% prefer family and friends, 26% prefer newspapers, and 26% prefer outdoor advertisements for information about electric vehicles.

7. Analysis shows that if consumers want to buy an electric vehicle, 57.4% of Tata will choose an electric vehicle and a small percentage will choose a Tesla.

8. Most respondents agree that electric vehicles can replace conventional vehicles in terms of meeting consumer needs.

9. 80.9% of the 70 respondents know about government subsidies for buying electric vehicles soon, and 19.1% don't know about them.

LIMITATIONS

1. Data were collected only from the town of Phagwara (near the Law Gate of the LPU), so the results affect only a small fraction of the population.

2. Limited time.

3. Due to data collection via surveys in online mode, we may not be able to fully answer your questions.

SUGGESTION

A. Governments should implement significant subsidy plans and mandates to encourage buyers to look at electric vehicles.

B. The next important thing is to develop a good network charging infrastructure.

C. Involve private players for more investment so the network will be fast.

D. Government should try to cover schemes such as the" Make in India Initiative" with the EV Policy.

E. Make awareness of more EV benefits and their advantage against other modes of transport.

F. EV stakeholders should come up with robust business models for charging infrastructure and for EVs such as retrofitting.

CONCLUSION

We may infer from the questionnaires that individuals prefer electric automobiles over electric bikes or electric scooters. When purchasing electric vehicles, people consider the cost, low noise level, and newest developments. Most respondents believe that electric vehicles are extremely expensive. The majority of respondents concur that electric cars can take the place of conventional cars in terms of meeting consumer needs.

Electric vehicles are preferred by most users because of their high mobility, comfort, maintenance, cost, and durability compared to conventional vehicles. In general, based on our analysis, we can conclude that the majority of respondents prefer electric vehicles and are ready to switch to them in order to change their future needs. Respondents are aware of the state of the world's climate and are ready to change their choice from conventional cars to environmentally friendly ones. Cost is an important factor when considering purchasing an electric vehicle.

REFERENCE

Advances in consumer electric vehicle adoption research: A review and research agenda by Zainab Rizwani, Johan Jansson, and Jan Bodolin (2014)

Link:https://www.researchgate.net/publication/268527303_Advances_in_consumer_electric_vehicle_adoption_research_A_review_and_research_agenda

Consumer Perception Towards Electric Vehicle by Dr. RenuVashisth and Ms. Jyoti Gupta, both from (2021)

Link:https://www.cibgp.com/article_18183_28abc8ba0343300815f1fcd1291cb74e.pdf

A Study on the Adoption of Electric Vehicles in India: The Mediating Role of Attitude by Anil Khurana, V. V. Ravi Kumar, and Manish Sidhpuria (2019)

Link: https://journals.sagepub.com/doi/full/10.1177/0972262919875548

Adoption of electric vehicle: A literature review and prospects for sustainability by Rajeev Ranjan Kuma and Kumar Alok (2020

Link:https://www.sciencedirect.com/science/article/abs/pii/S095965261934781X

Factors influencing adoption of electric vehicles – A case in India by Sriram K. V., Lidwin Kenneth Michael, Sumukh S. Hungund, and Mabelle Fernandes (2022)

Link: https://www.tandfonline.com/doi/full/10.1080/23311916.2022.2085375

Adoption of Electric Vehicle in the A Stated Choice Experiment (TI 2013-100/VIII Tinbergen Institute Discussion Paper) by Marija Bockarjova, P. Rietveld, and J. S. A. Knockaert (2013)

Link:https://www.researchgate.net/publication/259705343_Adoption_of_Electric_Vehicle_in_the_A_Stated_Choice_Experiment_TI_2013-100VIII_Tinbergen_Institute_Discussion_Paper

Consumer preferences for electric vehicles: a literature review by Franchao liao, Eric molin and Bert van wee (2016)

Link: https://www.tandfonline.com/doi/full/10.1080/01441647.2016.1230794

A Study on the Adoption of Electric Vehicles in India: The Mediating Role of Attitude by Anil Khurana, V. V. Ravi Kumar and Manish sidpuria (2019)

Link: https://journals.sagepub.com/doi/full/10.1177/0972262919875548

Public Perception And Purchase Intentions About Electric Vehicles In The Punjab State Of India by Jashandeep Sing and Ramdeep Singh (2020)

Link:https://www.researchgate.net/publication/352477541_Public_Perception_And_Purchase _Intentions_About_Electric_Vehicles_In_The_Punjab_State_Of_India

Key factors influencing Electric Vehicles adoption by Valerian Geny, Anupama Unnikrishnan and Karlskrona (2021)

Link: https://www.diva-portal.org/smash/get/diva2:1604160/FULLTEXT02

The electric vehicle: a review by Tek Tjing Lie, Krishnamachar Prasad and Ning Ding (2017)

Link: https://www.researchgate.net/publication/314306141_The_electric_vehicle_a_review

CONSUMER ATTITUDE AND PERCEPTION TOWARDS ELECTRIC VEHICLES by Shinu p. Jose, siji cyriaccyriac and binu Joseph (2022)

Link:https://www.abacademies.org/articles/Consumer-attitude-and-perception-towardselectric-vehicles-1528-2678-26-1-106.pdf

CONSUMER PERCEPTION OF ELECTRIC VEHICLES IN INDIA by Mr. Omkar tupe, prof. Shweta kishor and Dr. Arloph johnvieira (2020)

Link:https://ejmcm.com/article_7216_a56db3d7f55a5b1ac66729c3a1ce910e.pdf

Mathematical modelling of electric vehicle adoption: A systematic literature review by Lucy Maybury, Patrick Corcoran, and Liana Cipcigan (2022)

Link: https://www.sciencedirect.com/science/article/pii/S1361920922001067