



ASTUDY ON “CONSUMER PREFERENCE TOWARRDS E-VEHICLES VADODARA”

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ABSTRACT

This paper includes what are the various factors that affect the overall perception of a consumer towards an EV and whether or not those factors have a relationship with the perception towards the electric vehicle.

Also, this study includes topics like why should we switch to electric vehicle and what is the need for an electric vehicle and how should we adopt it and are we ready enough to adopt this technology in to our daily routine. And what are the various types of EV currently present and what all are the factors that directly influence an EV adoption in country like India.

And when was first EV introduced and how does it grow from back then until now .In this study we also take into account the relationship between barriers and the perception towards EV and also to find out this we have used statistical tools and graphs, which are done using one factor ANOVA test.

Also, some attributes related to the consumer are also taken into account and how they influence it perception and how these attributes affect the factors and barriers for the EV perception and adoption .

KEYWORDS:

Customer

EV

Sustainable development

Attributes

INTRODUCTION

All about EV

According to an electric vehicle is a vehicle that uses one or more electric motors or traction motors for propulsion. An electric vehicle may be powered through a collector system by electricity from off-vehicle sources, or may be self-contained with a battery, solar panels, fuel cells or an electric generator to convert fuel to electricity. EVs include, but are not limited to, road and rail vehicles, surface and underwater vessels, electric aircraft and electric spacecraft.

EVs first came into existence in the mid-19th century, when electricity was among the preferred methods for motor vehicle propulsion, providing a level of comfort and ease of operation that could not be achieved by the gasoline cars of the time. Modern internal combustion engines have been the dominant propulsion method for motor vehicles for almost 100 years, but electric power has remained commonplace in other vehicle types, such as trains and smaller vehicles of all types.

How does the electric engine work?

Electric cars function by plugging into a charge point and taking electricity from the grid. They store the electricity in rechargeable batteries that power an electric motor, which turns the wheels. Electric cars accelerate faster than vehicles with traditional fuel engines – so they feel lighter to drive.

How does charging work?

You can charge an electric vehicle by plugging it into a public charging station or into a home charging unit. There's plenty of charging stations around the UK to stay fully charged while you're out and about. But to get the best deal for home charging, it's important to get the right EV electricity tariff, so you can spend less money charging and save more on your bill.

Charging

Plug into an outlet or EV charging point to charge your battery

OBJECTIVES

- To test consumer awareness about e-vehicles.
- To spread awareness about e-vehicles.
- To research the factors driving customers to buy electric vehicles.
- To understand the various government e-transportation initiatives in India

LITERATURE REVIEW

(Chan, 2002) Environmental challenges force the transportation sector to move to more eco-friendly technologies. Electric Vehicles (EVs) are regarded as a green transportation solution. The main focus of the paper is on batteries as it is the key component in making electric vehicles more environment-friendly, cost-effective and drives the EVs into use in day-to-day life

(Hoyer, 2008) The technology behind Electric vehicles exists for more than a century. However, due to the availability and the ease of use of combustion engines, electric driving was put on hold. Today, different (pushing and pulling) factors recover the interest in Electric vehicles. On the pushing side, the limited oil supply and the rising awareness of the environmental footprint of conventional combustion engine vehicles lead the way to cleaner Electric vehicle. On the pulling side, recent developments in battery technology and electric motors make the Electric vehicle a valid contender for conventional cars.

(Neumann et al 2010) Environmental perspective, increase in high CO₂-emissions and depletion of Fossil reserves, the roll out of Electric vehicle can be perceived as a safety measure and future security. Technology to be used in the upcoming EV is very mature and uptrend leading to high distance coverage with efficiency and comfort.

(Ghasri et al., 2019; Sierchula et al., 2014) Demand studies have explored the financial, technical, essential and political concepts of EVs to help governments and car manufacturers evaluate consumer preferences (Liao et al., 2017). Driving range, refilling time and owning costs have been identified as some of the factors influencing EV purchasing decisions. Some studies have used stated preference techniques to explore heterogeneity in consumer preferences when deciding to purchase an Electric vehicle.

Barriers in adoption of EV

The acceptance of EVs in India depends upon a series of real or perceived factors, these barriers were identified through reading and comprehending various literature review, relevant online content, previously published studies, articles, blogs and websites also. All in all three barriers were found to be of much importance they are as follow

Technical barriers

Social barriers

Economic barriers

1. Technical Barriers: - most of the consumers are not aware of the technology of EV making them feel uncomfortable while using or purchasing an EV. The awareness about EV technology in India is almost negligible, thus the sales of the EV is relatively low.

Social barrier

include how the consumer understands the attributes of EV, like the consumer knowledge, environment, experience and other people around.

Lack of knowledge

the Indian consumer is not fully aware of the benefits and limitations of the EVs. They do not know the functioning of the EV and hence perceive that the EV will cost them more than the conventional vehicle. They are also not aware of the saving they could generate by not purchasing – petrol or diesel.

Economic barriers:

the EVs are way more expensive than a conventional vehicle and the lower cost of the other vehicle are generally the biggest barrier for the EVs. Also, there are other cost involved with an EV, which are its battery replacement cost and the charging cost. Lack of offers from the company as compared to the conventional vehicle.

Research Instrument : Research instrument adopted in the research is “questionnaire” which is convenient and helpful in obtaining the responses from the respondents. The questionnaire in the form of Google Forms is used. Questionnaire consists of a number of close ended questions and Likert scale question were also designed in a particular order.

Sample : A sample, as the name applies, is a smaller representation of larger whole. The selected respondents constitute what is technically called a sample and the selection process is called sampling. The sample is collected mainly from Vadodara.

Sample size: The number of people in your survey depends on the population size and how accurately you want the findings to reflect the population as a whole. It refers to the number of sampling units selected from the universe for investigation. The sample size of 58 vadodara respondents has been taken.

Research Instrument:

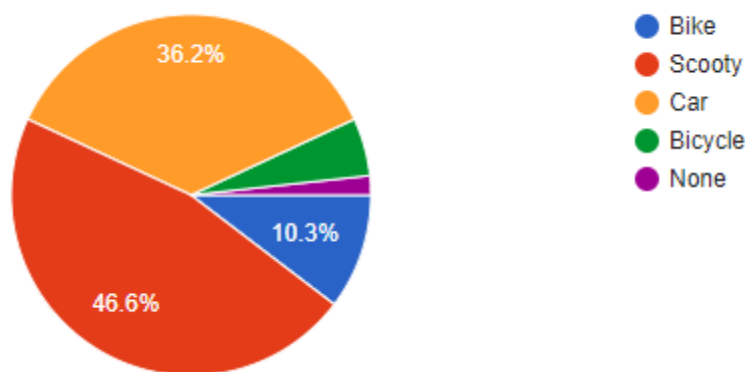
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DATA ANALYSIS AND INTERPRETATION

This research is based on the vadodara respondents' perception, and awareness mostly focusing towards the electric vehicles in the metropolitan cities. The factors which act as a hurdle in respondents to buy an electric vehicle in the near future would then be used to determine and analyze and does this factor really affect the purchase of an EV.

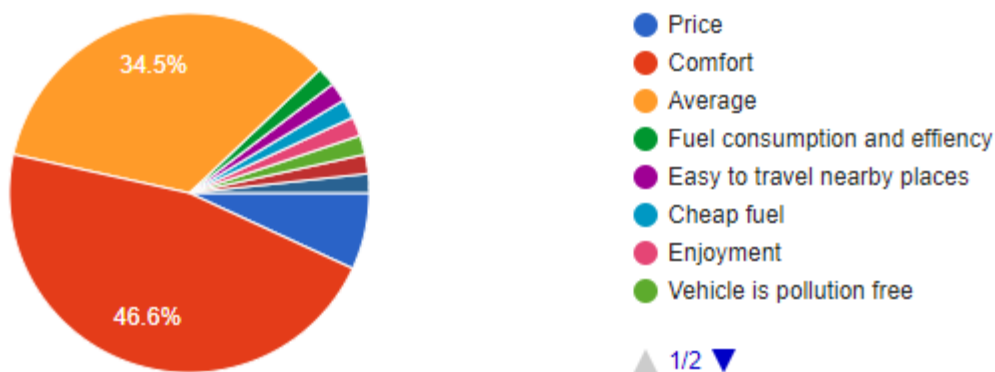
Result of the survey

1. Which type of E-vehicle do you prefer to purchase?



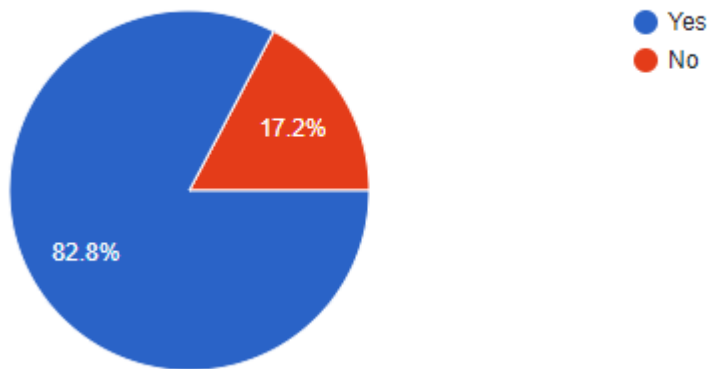
Interpretation:- From above the graph it has interpreted that 46.6% of the respondent are prefer to purchase E-vehicle.

2. What attracted you towards E-vehicle?



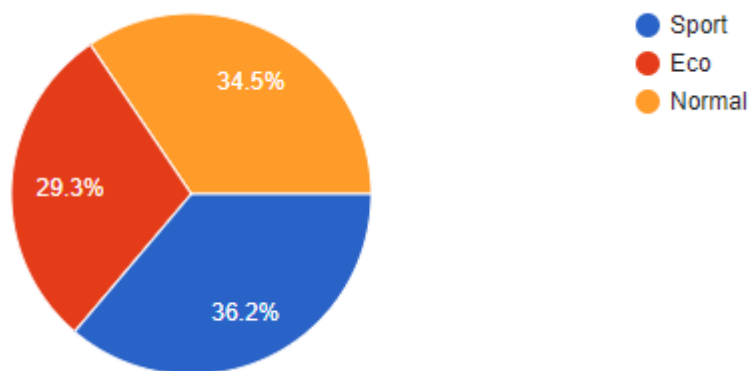
Interpretation:- From above the graph it has interpreted that 46.6% of the respondent are attracted us towards E-vehicle.

3. Does Brand value of E-vehicles attracts you ?



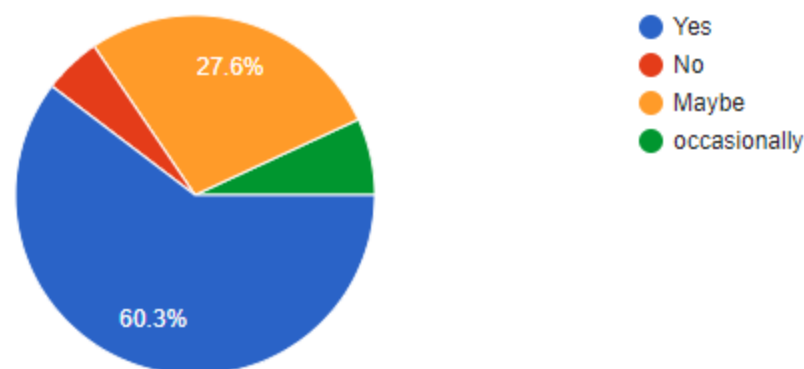
Interpretation:- From above the graph it has interpreted that 82.8% of the respondent are attracts of brand value of E-vehicle.

4. Which mode do you prefer to use?



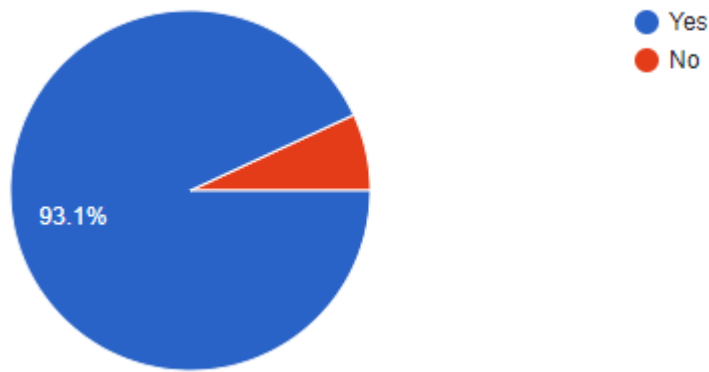
Interpretation:- From above the graph it has interpreted that 36.2% of the respondent are prefer to use sport E-vehicle.

5. While buying E-vehicles do you go for discount?



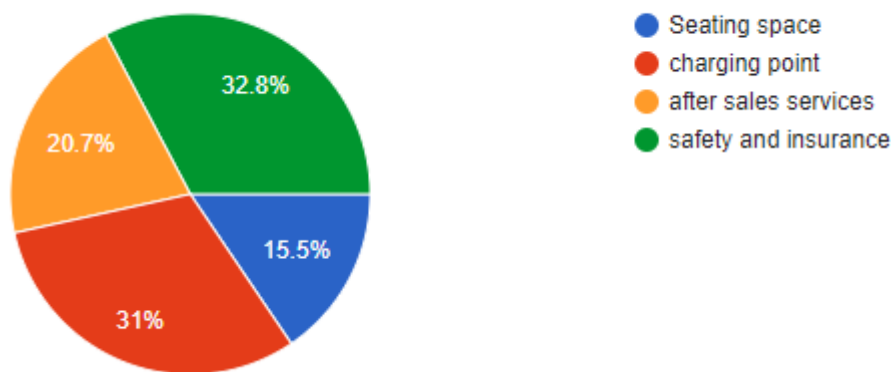
Interpretation:- From above the graph it has interpreted that 60.3% of the respondent are buying E-vehicle go for discount.

6. Do you prefer insurance policy along with E-vehicles?



Interpreted:- From above the graph it has interpreted that 93.1% of the respondent are prefer insurance policy along with E-vehicles.

7. Which segment of E-vehicles affect your purchase decision?



Interpreted:- From above the graph it has interpreted that 32.8% of the respondent are prefer to safety and insurance affect in E-vehicles.

Conclusion and Suggestion

From the analysis, it can be concluded that the various factors affect the perception towards the electric vehicle. The impact will be cumulative of all the factors. And unlike the conventional gasoline engine vehicles, which can cover a larger distance per litre of oil, electric vehicles require frequent charging for covering the same distances. This is primarily due to the battery capacity of these vehicles. Hence, these vehicles might see a greater adoption and acceptance for short distance travels. Because of other facilitating factors, the growth of this segment will be largely propelled by the two-wheeler and three-wheeler vehicles, light motor vehicles (LMVs) and city buses. For long distance vehicles like trucks and UVs, further development is required in the battery capacity and technology and investment in the charging infrastructure.

Because of the limited use of the electric vehicles, it can be seen that the shift towards the adoption of electric vehicles might not have a very huge and robust but with all the facilitating factors stated below we can hope that the transition from gasoline powered cars to electric vehicles would be fast and humongous.

- Increasing EV charging stations
- Government incentivizing policies for EV purchase
- Improving infrastructure
- Increase in the EV range

- Reducing the price of the EV
- Educating consumer about EV benefits
- Providing more EV choices to consumer
- Implementing strict pollution norms

Also, with respect to electric vehicles, the country is expected to one of the fastest growing countries and has a huge consumer base for the adoption and usage of electric vehicles. This could attract the foreign players along with the domestic one like Mahindra to invest in the production of electric vehicles.

The estimated battery market potential is USD 580 million in 2019 and is forecasted to grow to USD14.9 billion by 2027," it noted. The EV sales in India stood at 3.8 lakh units in 2019-20, and the EV battery market stood at 5.4GWh during the year. The electric two-wheelers were the highest selling in the entire segment last fiscal.

As per the report, low and medium-speed electric two-wheelers (up to 40 kmph) with conventional lead-acid batteries were dominating the market. ..

"With more companies getting FAME-II certification in 2020, sale of high-speed electric two-wheelers is expected to increase rapidly," it added.

In terms of battery technology in the electric two-wheeler segment, lead-acid technology will be completely out of the market in the next five years, it said.

Elaborating on the electric vehicle market the report noted that the demand in the vertical is expected to be driven with subsidy support from the Central government due to high upfront cost. Besides, the electric vehicle market is poised for growth in the upcoming years as many new markets such as Raipur, Indore, Bhopal, have opened last year.

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