



Universal Business School, Mumbai

Research paper

A study on Consumer Buying Behaviour towards Electric Vehicle

Submitted by

Ishika Ranjan (PGDMBDI2/2130)

Sawan Kumar Jha (PGDMBDI2/2158)

Shuvam Mondal (PGDMBDI2/2165)

Under The guidance of

Prof. Guruprasad Muthuleshan

(HOD-General Management, Deputy director Research)

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ABSTRACT

The research will be focusing on the consumer demand for electronic vehicles by looking at the impact of consumer innovation and concerns on the functional capabilities of electronic vehicles over their preferences. A conceptual framework is devised and implemented that comprises measures of innovativeness at an adoption level, based on an assessment of technology ownership and a cohort of psychological and social factors. With the ongoing depletion of fossil fuel and price hikes, an alternative to power vehicles is required. Electric vehicles are being introduced by India's automobile industry as a solution to the industry and environment. Despite the government enacting electronic vehicle policies, the current market penetration of electronic vehicles is very low. Consumer buying behaviour along with their perceptions towards electric vehicles in India will be examined in this paper. The research will be based on primary and secondary data. The data will be collected by a questionnaire and a small market survey. The target for the data collection will be two-wheeler OEM dealers, students, working employees. The target end consumer will be from tier 1 and tier 2 cities.

A. Objective of the study

- To understand the buying behavior of consumers towards electric vehicles.
- To recognize the important parameters affecting consumers' vehicle purchasing decisions.
- To understand the growth of electric vehicles industry in India.
- To recognize consumers' perception of internal combustion engines.

B. Hypothesis

- There is no association between fuel price hikes and owning an electric vehicle.
- There is no association between protecting environment campaigns and owning an electric vehicle.
- There is no association between age group, education qualification, and awareness about electric vehicles.

C. Problem Statement

The growth of electric vehicles is very slow in India, and not many electric vehicle industries are coming to India for setup. Consumers are not having much knowledge about electric vehicles. Consumers who all are already having vehicles are not willing to switch to an electric vehicle because of certain aspects.

Keywords:- *Electronic vehicles, consumer innovation, technology ownership, fossil fuel, consumer perception, environment, government policies, market penetration, buying behaviour.*

CHAPTER 1

INTRODUCTION TO THE TOPIC

A. Electric Vehicle

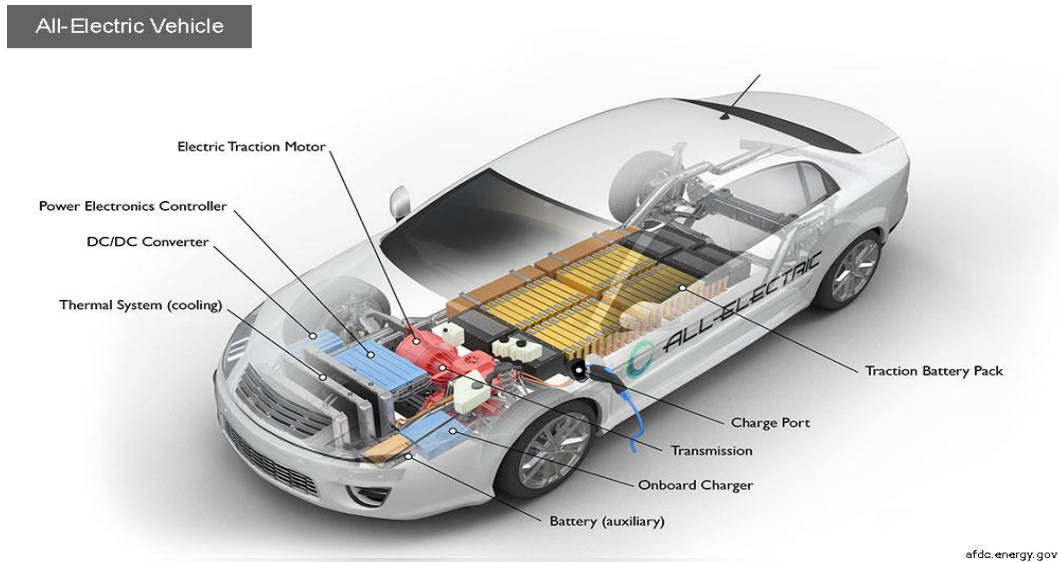


Fig. 1

Electric cars have low running costs due to fewer moving parts to maintain, and they are also highly environmentally friendly because they utilize little to no fossil fuels (petrol or diesel). While some electric cars used lead-acid or nickel-metal hydride batteries, lithium-ion batteries are now the industry standard because they have a longer lifespan and are better at retaining energy, with a monthly self-discharge rate of just 5%. Despite this improved efficiency, these batteries are still subject to thermal runaway, which has resulted in fires or explosions in the Tesla Model S, despite attempts to enhance battery safety.

An electric vehicle, such as an electric car, requires one or more electric motors powered by a battery pack to accelerate and drive. Depending on the kind of EV, the electric motor(s) may assist or completely power a conventional internal combustion engine (ICE).

B. Types of Electric Vehicle

When we talk about electric vehicles, we usually refer to three types: hybrid electric vehicles (HEV), plug-in hybrid electric vehicles (PHEV), and battery electric vehicles (BEV) (BEV).

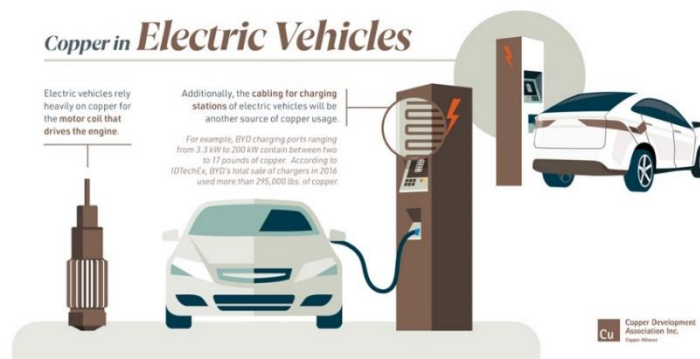


Fig. 2

C. Consumer Buying Behavior

Customers' behaviors before purchasing a product or service are referred to as consumer buying behavior (both online and offline). This might include things like utilizing search engines, replying to social media posts, and a range of other things. Organizations benefit from understanding this process because it helps them to better match their marketing endeavors to past marketing campaigns that have successfully induced customers to buy.

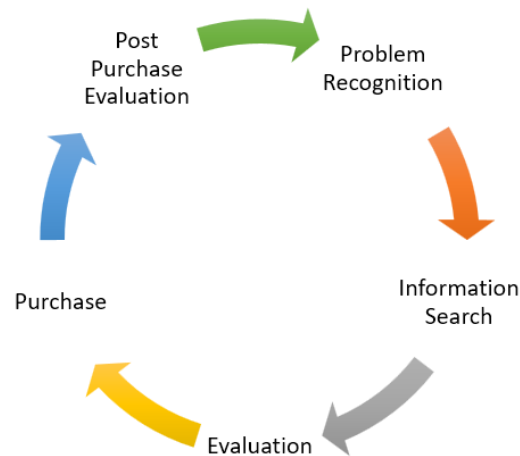


Fig. 3

D. Factors of influencing Customer Buying behavior

- Cultural Factors - A person's culture is not defined just by their nationality. It might be determined by their religious beliefs, associations, or even geographical area.
- Social Factors - Aspects of a person's surroundings that have an impact on their product views.
- Personal Variables - Personal factors include age, marital status, budget, personal ideas, values, and morals.
- Psychological Factors - When a person is faced with a product, their mental state often impacts how they feel about the product and the brand as a whole.



Fig. 4

CHAPTER 2

LITERATURE REVIEW

S. No.	Title	Author	Summary of finding	Source
1	Exploring consumer preferences towards electric vehicles: The influence of consumer innovativeness	Jillian Leigh Anable Craig Morton	Understanding of consumer response to EVs by evaluating if consumer innovativeness is related to the expressed preference towards EVs.	https://www.researchgate.net/publication/295394864_Exploring_consumer_preferences_towards_electric_vehicles_The_influence_of_consumer_innovativeness
2	Govt Policies of 2021 for Auto Sector to Help Boost EV adoption	Sansuti Nath	India aims to switch 30 percent of private cars, 70 percent of commercial vehicles, and 80 percent of two and three-wheelers to EVs by the year 2030.	https://www.india.com/business/govt-policies-of-2021-for-auto-sector-to-help-boost-ev-adoption-5157884/
3	Know the Top 8 reasons for the slow growth of EVs	K. Nandini Tornekar	Top 8 reasons for the slow growth of EVs.	https://electricvehicles.in/know-the-top-8-reasons-for-the-slow-growth-of-evs/
4	The road to the future of electric vehicles in India	Raghav Kalra	The road to an Electric Vehicle future still has a few potholes, but these challenges can be fixed.	https://www.thehindu.com/sci-tech/technology/the-road-to-the-future-of-electric-vehicles-in-india/article65233617.ece

Table 1

(Anable & Morton, 2016) concentrated on understanding consumer response to EVs by evaluating whether consumer innovativeness relates to the expressed preference towards EVs. He defined consumer innovativeness as a consumer's innate and revealed willingness to accept new items with different or more sophisticated features and functionalities. The technical specifications of electric vehicles differ significantly from those of vehicles powered by internal combustion engines.

Specifically, practical differences between EVs and conventionally powered automobiles include vehicle range, price premiums, operational expenses, refueling habits, and purported environmental advantages. As a result, some analysts have labeled EVs as a sort of disruptive innovation (Christensen, 1997). Because of the unique features of electric cars and their present low sales volumes (DfT, 2013), predicting anticipated consumer responses based on the existing market is difficult.

(Nath, 2021) his journal mentioned the government of India amended the current FAME-II (Faster Adoption and Manufacturing of Electric Vehicles-II) initiative in June of this year. The government narrowed the price difference between petrol-powered two-wheelers and electric two-wheelers by boosting the subsidy rate for electric two-wheelers from Rs 10,000/kWh to Rs 15,000/kWh, as well as capping incentives at 40% of vehicle costs, rather than 20% previously. This policy also supports about 2,700 charging stations in the largest cities, other cities with over a million in population, smart cities, and cities in

hilly states across the country, with the objective of having at least one charging station in every 3 km x 3 km grid. In addition, charging stations are planned for every 25 km on highways.

(Tornekar, 2020) stated the eight possible reasons for the slow growth of EVs in India. He mentioned charging time, price of an EV, range depending on battery capacity, charging infrastructure, limited life of batteries, fear of new technology, government incentives, lack of advertisements, and awareness campaigns as the obstacles to EVs growth in India.

(Kalra, 2022) studied 63 percent of consumers assuming that an EV is out of their budget, the capital cost has always been a big issue in EV purchasing decisions. Our country's lack of suitable charging infrastructure is a major impediment to greater EV adoption. But large OEMs are also taking steps to enter the EV component industry in order to lessen dependency on imports and achieve the government's 50 percent localization requirement for government subsidies. However, he also mentioned a comprehensive infrastructure that is inexpensive, accessible, and supports all consumer groups, along with a solid finance environment, governmental incentives, and technology developments are anticipated to position the electric vehicle industry for major expansion over the next decade.

CHAPTER 3

DATA ANALYSIS AND INTERPRETATION

A. Introduction

This chapter presents the findings of the study based on the data collected from the respondents in relation to the objectives of the study. The objectives of the study were to understand the buying behaviour of the respondent toward electronic vehicle.

The questionnaire was formed keeping in mind the likes and dislikes form the potential customer of electronic vehicle and their willing to change to electronic vehicle.

The questionnaire was divided into three parts

- Section 1

The personal information of the respondent.

- Section 2

Weather the respondent is willing to switch to an electronic vehicle or not and the reason.

- Section 3

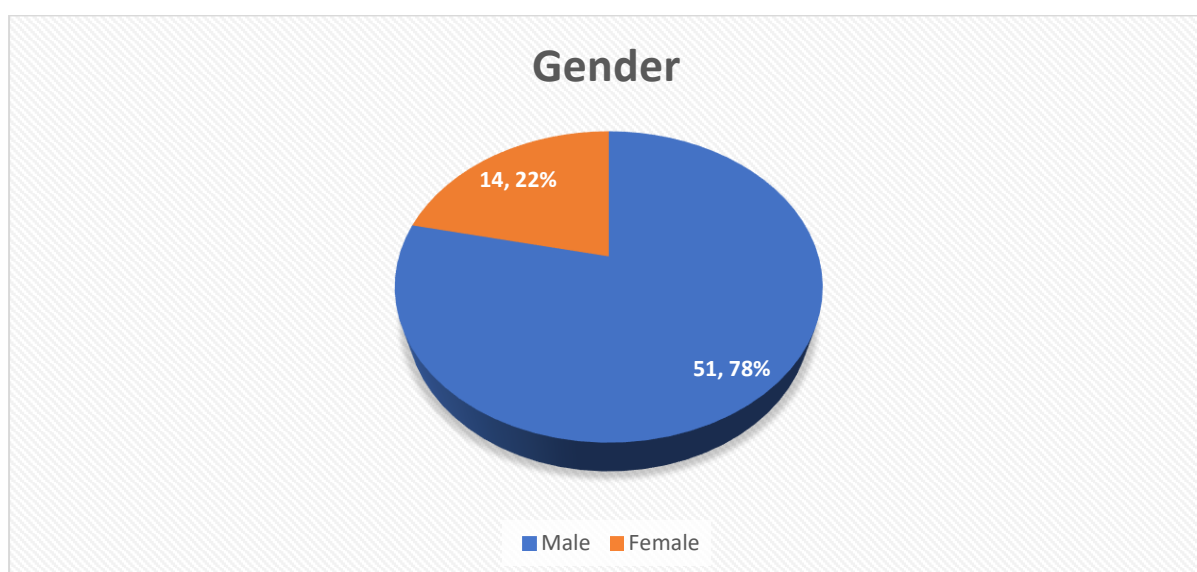
The point of view of the respondent towards electronic vehicle.

- Section 1: The personal information of the respondent**

S. No.	Gender	Frequency	Percentage (%)
1.	Male	51	78.5%
2.	Female	14	21.5%
	Total	65	100%

Table 2: Gender of the respondent

In Table 2, the respondent was divided into 2 groups based on the respondent Gender. The frequency and percentage of the respondents are shown in table 1. Out of 65 respondents, 51 respondents (78.5%) are male and 14 respondents (21.5%) are female. This has been explained in the graph:1 below.

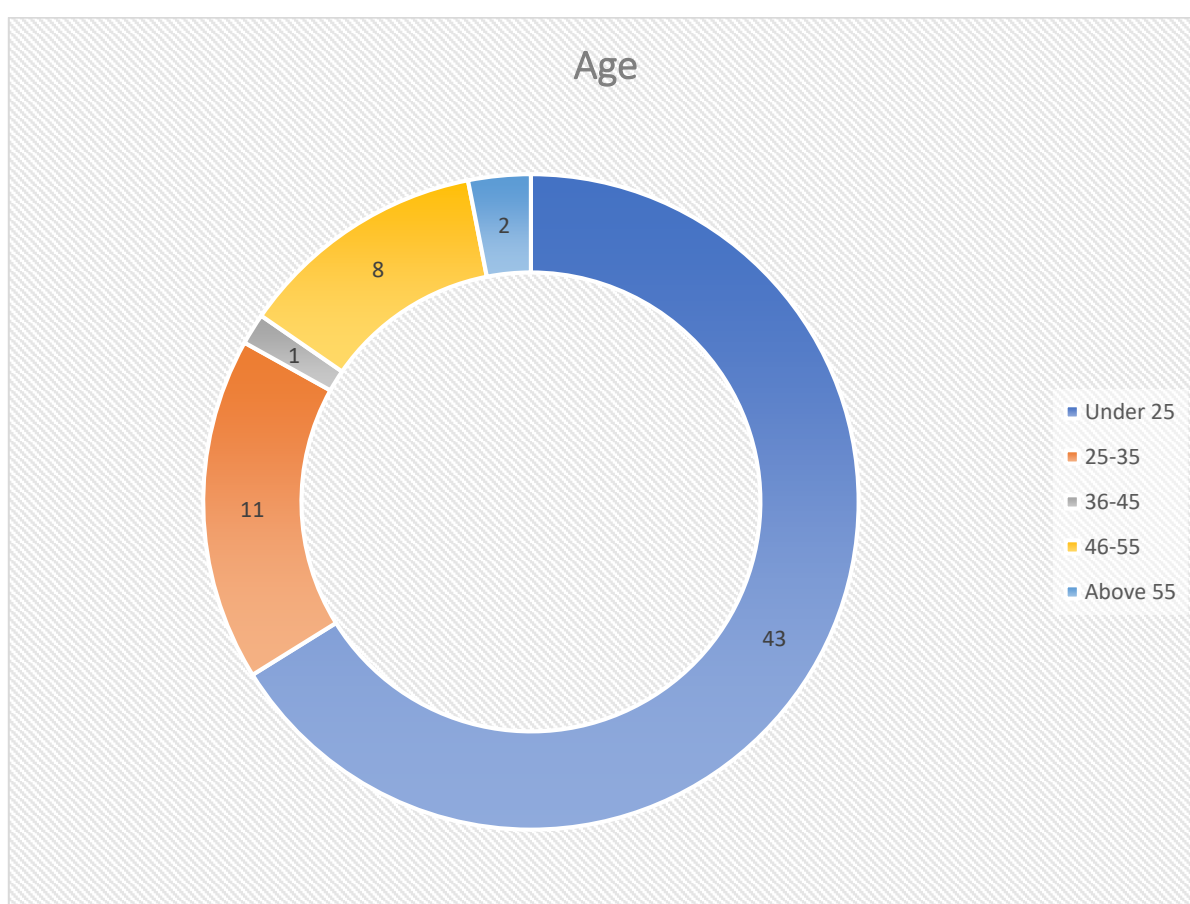


Graph 1

S. No.	Age	Frequency	Percentage (%)
1.	Under 25	43	66.2%
2.	25-35	11	16.9%
3.	36-45	1	1.5%
4.	46-55	8	12.3%
5.	Above 55	2	3.1%
	Total	65	100

Table 3: Age of the respondent

In Table 3, the respondent was divided into 5 groups based on the respondent age group. The frequency and percentage of the respondents are shown in table 2. Out of 65 respondents, 43 respondents (66.2%) were under 25 years, 11 respondents (16.9%) were in the age between 25-35 years, 1 respondent (1.5%) was in the age between 36-45 years, 8 respondents (12.3%) were in the age between 46-55 and 2 respondents (3.1%) were above 55 years. This has been explained in the graph:2 below.



Graph 2

S. No.	Qualification	Frequency	Percentage (%)
1.	Undergraduate	28	43.1%
2.	Postgraduate	28	43.1%
3.	Diploma	9	13.8%
	Total	65	100%

Table 4: Qualification of the respondent

In Table 4, the respondent was divided into 3 groups based on the respondent Qualification. The frequency and percentage of the respondents are shown in table 3. Out of 65 respondents, 28 respondents (43.1%) were having Undergraduate degree, 28 respondents (43.1%) were having Postgraduate degree and 9 respondents (13.8%) were having diploma degree. This has been explained in the graph:3 below.



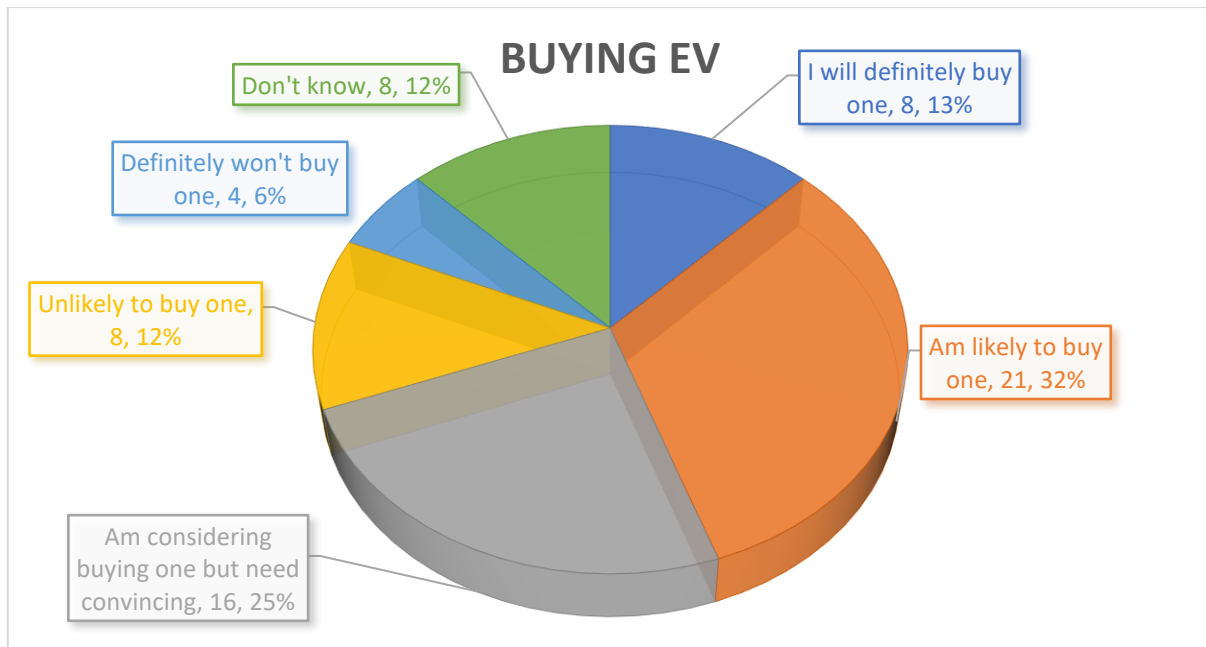
Graph: 3

• **Section 2 : Weather the respondent is willing to switch to an electronic vehicle or not and the reason**

S. No.	Buying EV	Frequency	Percentage (%)
1.	I will definitely buy one	8	12.3%
2.	Am likely to buy one	21	32.3%
3.	Am considering buying one but need convincing	16	24.6%
4.	Unlikely to buy one	8	12.3%
5.	Definitely won't buy one	4	6.2%
6.	Don't know	8	12.3%
	total	65	100%

Table 5: How likely are respondent considering to buy an electric vehicle in the next 2 years?

In Table 5, the respondent was divided into 6 groups based on the interest to buy an electronic vehicle. The frequency and percentage of the respondents are shown in table 4. Out of 65 respondents, 8 respondents (12.3%) were definitely going to buy one, 21 respondent (32.3%) were likely to buy one, 16 respondents (24.6%) were considering to buy but need some convincing, 8 respondents (12.3%) were unlikely to buy, 4 respondents (6.2%) were definitely not going to buy and 8 respondents (12.3%) were not knowing whether they are going to buy it or not. This has been explained in the graph:4 Below.

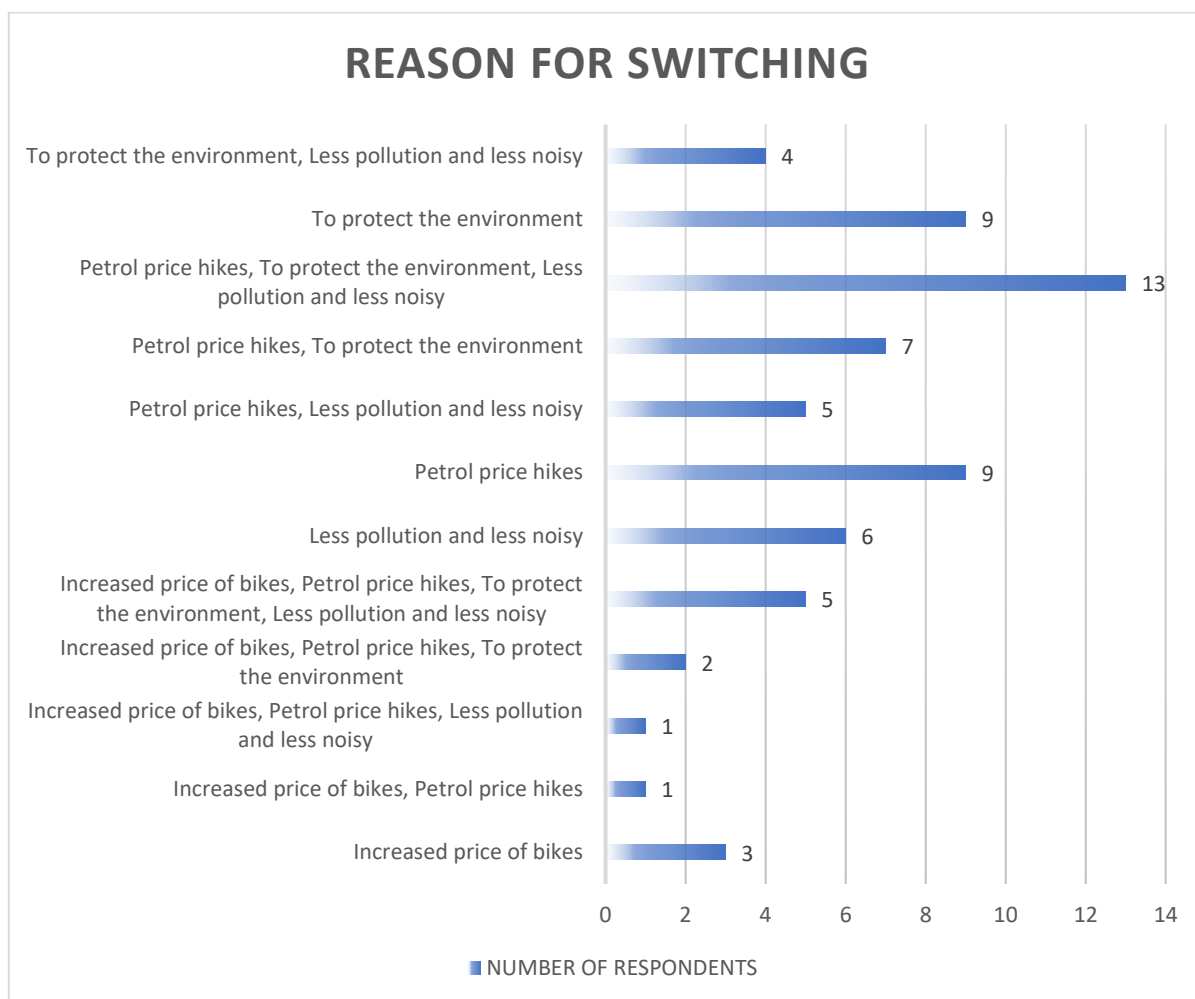


Graph 4

S. No	Reason	Frequency	Percentage (%)
1.	Increased price of bikes	12	18.5%
2.	Petrol price hikes	43	66.2%
3.	To protect the environment	40	61.5%
4.	Less pollution and less noisy	35	52.3%
	Total		

Table 6: Why the respondent is willing to switch to an EV?

In table 6, the respondent was having multiple choice to select the reason for willing for switching to an EV. The frequency and percentage of the respondents are shown in table 5. Out of 65 respondents, 12 of the respondents (18.5%) chose Increased price of bikes, 43 of the respondents (66.2%) chose Petrol price hikes, 40 of the respondents (61.5%) chose to protect the environment and 35 of the respondents (52.3%) chose Less pollution and less noisy. This has been explained in the graph:5 below.

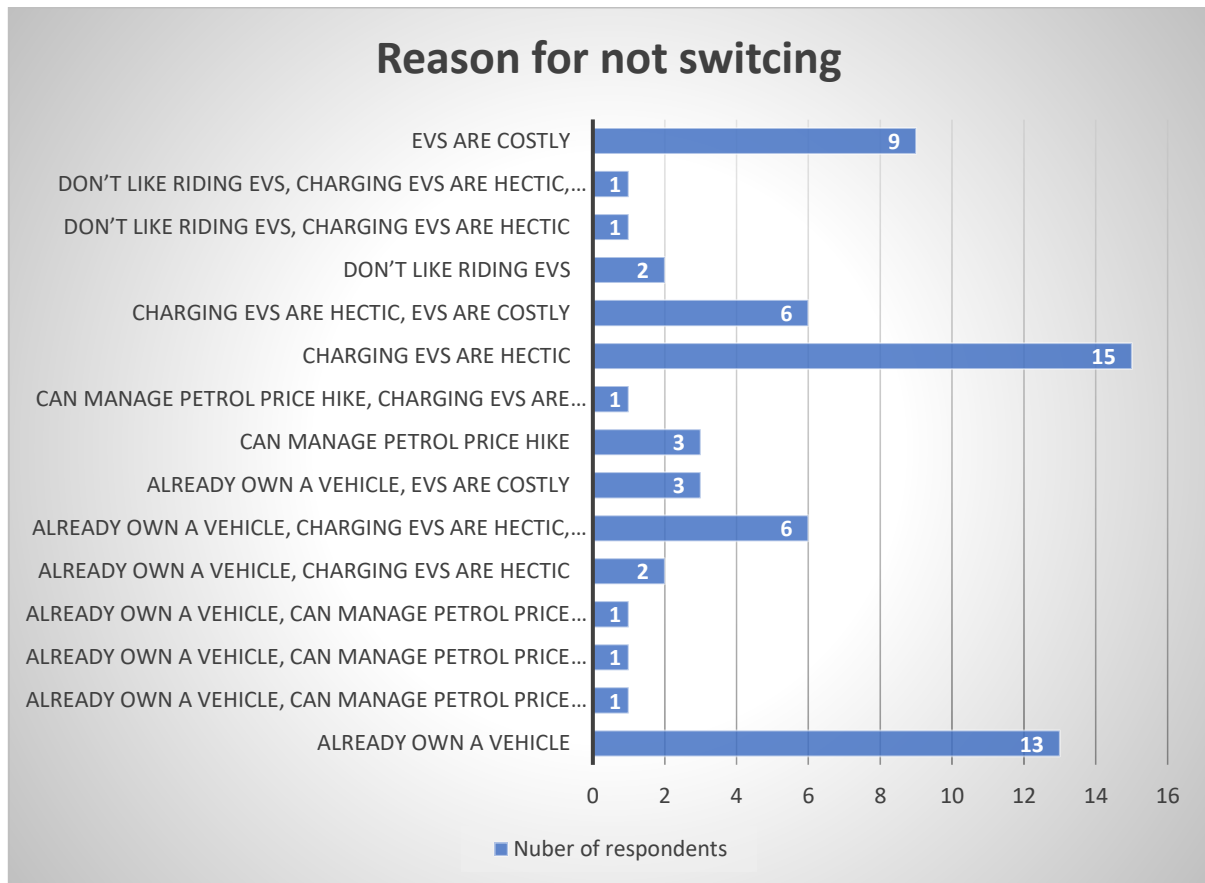


Graph 5

S. No.	Reason	Frequency	Percentage (%)
1.	Already own a vehicle	27	41.5%
2.	Can manage petrol price hike	7	10.8%
3.	Don't like riding EVs	5	7.7%
4.	Charging EVs are hectic	33	50.8%
5.	EVs are costly	28	43.1%
	Total		

Table 7: Why the respondent is not willing to switch to an EV?

In table 7, the respondent was having multiple choice to select the reason for not willing for switching to an EV. The frequency and percentage of the respondents are shown in table 6. Out of 65 respondents, 27 of the respondents (41.5%) selected already own a vehicle, 7 of the respondents (10.8%) selected can manage petrol price hike, 5 of the respondents (7.7%) selected don't like riding EVs, 33 of the respondents (50.8%) selected charging EVs are hectic and 28 of the respondents (43.1%) selected EVs are costly. This has been explained in the graph:6 below.



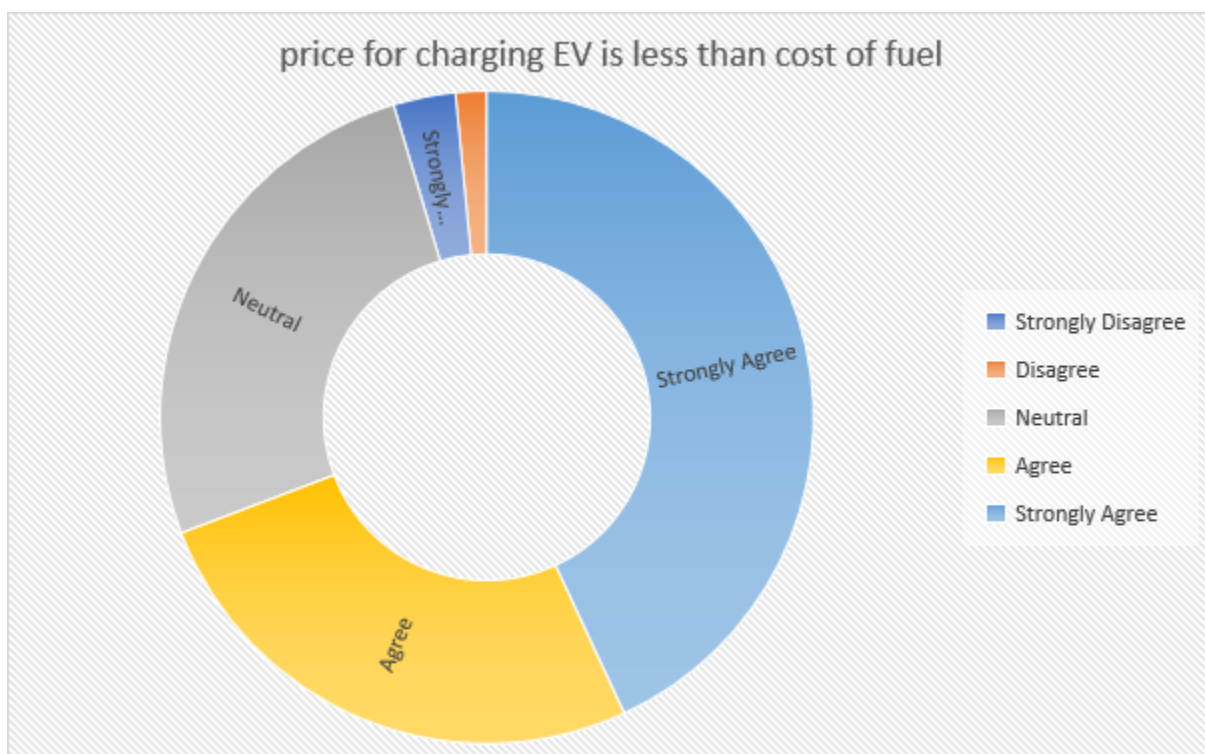
Graph 6

• Section 3: The point of view of the respondent towards electronic vehicle.

S. No.	Views	Frequency	Percentage (%)
1.	Strongly Disagree	2	3.1%
2.	Disagree	1	1.4%
3.	Neutral	17	26.2%
4.	Agree	17	26.2%
5.	Strongly Agree	28	43.1%
	Total	65	100%

Table 8: The cost to charge an electric vehicle is much less than the fuel costs for a petrol or diesel vehicle

In table:8, the respondent was divided into 5 groups based on the respondent point of view towards the statement. The frequency and percentage of the respondents are shown in table 7. Out of 65 respondents, 2 respondents (3.1%) were strongly disagreed with the statement, 1 respondent (1.5%) were disagreed with the statement, 17 respondents (26.2%) were neutral with the statement, 17 respondents (26.2%) were agreed with the statement and 28 respondents (43.1%) were strongly agreed with the statement. This has been explained in the graph:7 below.

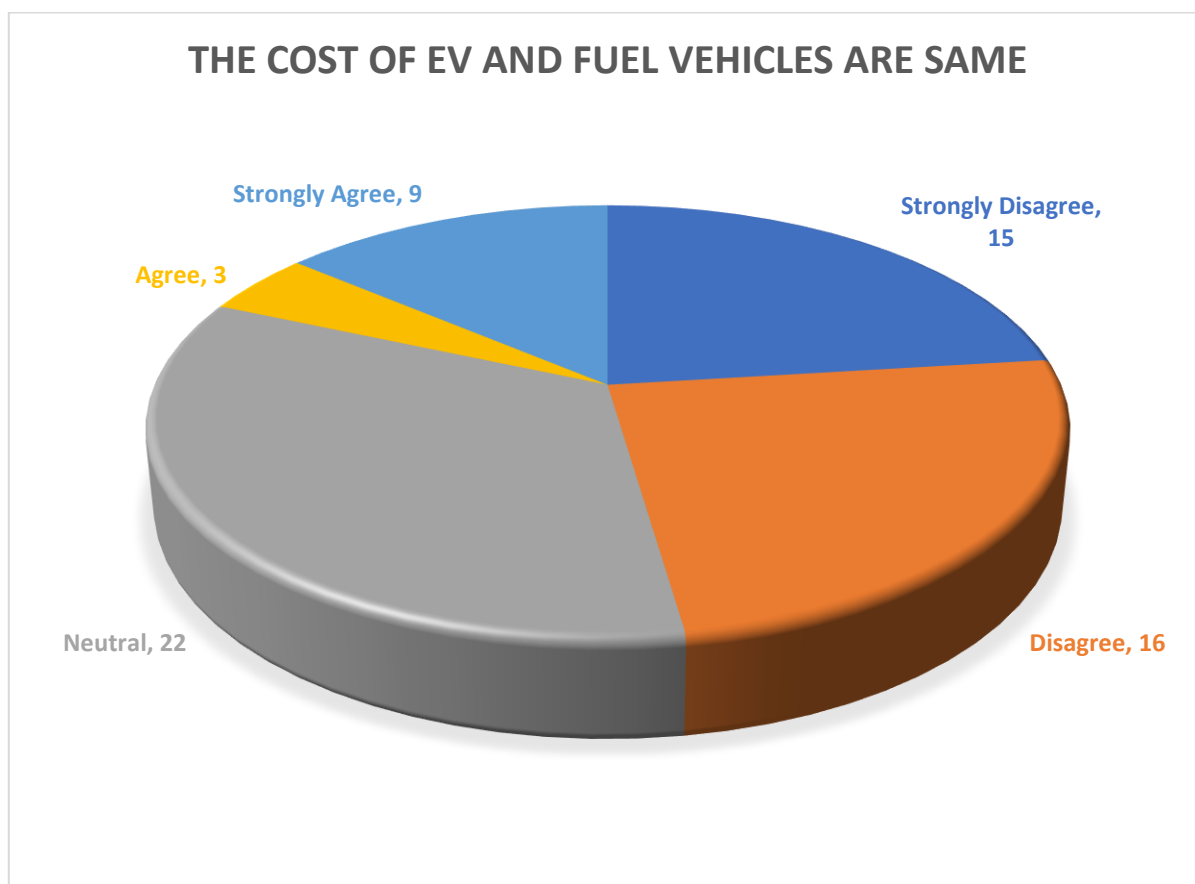


Graph 7

S. No.	Views	Frequency	Percentage (%)
1.	Strongly Disagree	15	23.1%
2.	Disagree	16	24.6%
3.	Neutral	22	33.8%
4.	Agree	3	4.5%
5.	Strongly Agree	9	13.8%
	Total	65	100%

Table 9: Electric vehicles cost about the same to buy as petrol or diesel vehicles

In table: 9, the respondent was divided into 5 groups based on the respondent point of view towards the statement. The frequency and percentage of the respondents are shown in table 8. Out of 65 respondents, 15 respondents (23.1%) were strongly disagreed with the statement, 16 respondent (24.6%) were disagreed with the statement, 22 respondents (33.8%) were neutral with the statement, 3 respondents (4.6%) were agreed with the statement and 9 respondents (13.8%) were strongly agreed with the statement. This has been explained in the graph:8 below.

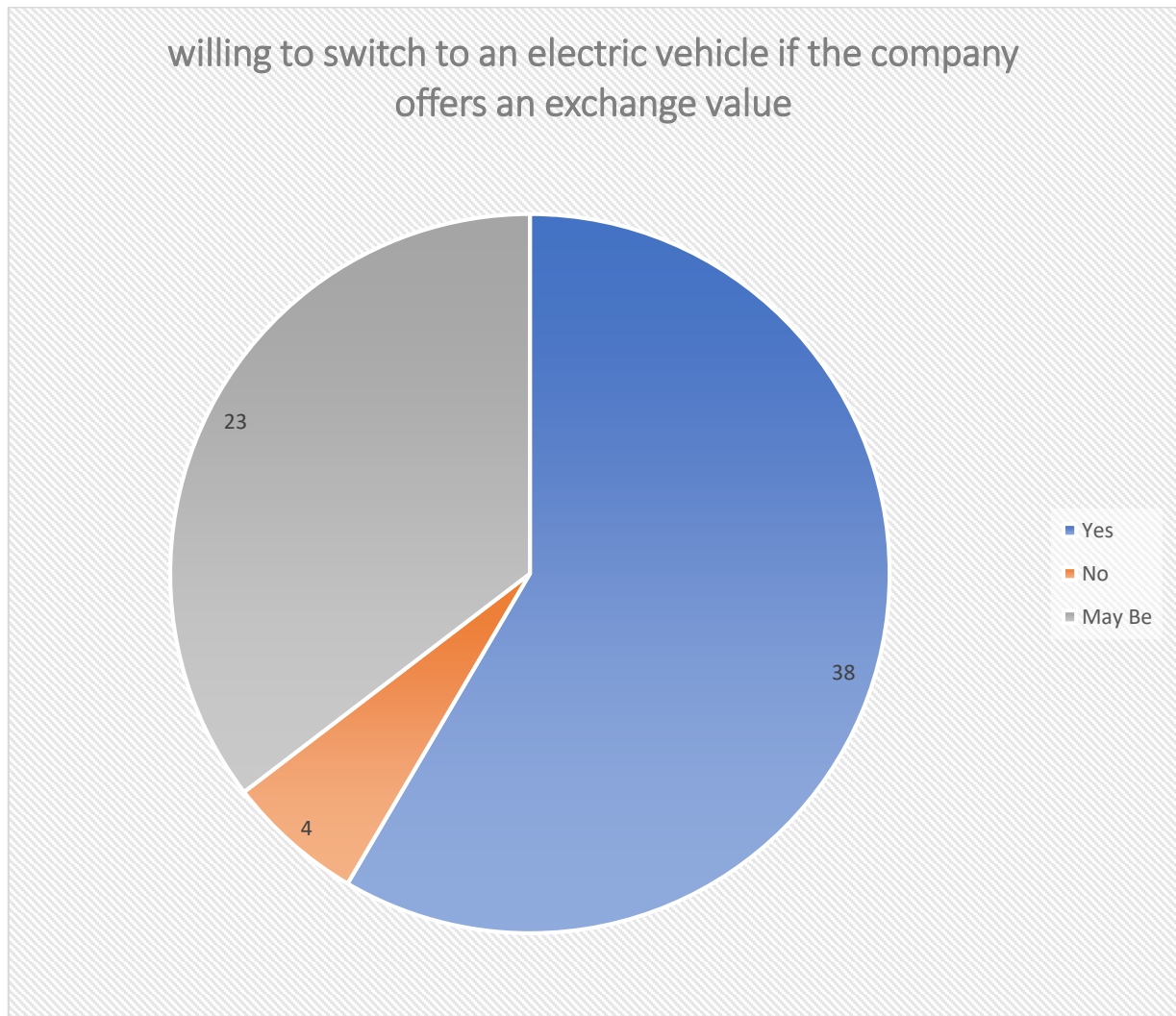


Graph 8

S. No.	Will you switch	Frequency	Percentage (%)
1.	Yes	38	58.5%
2.	No	4	6.1%
3.	May be	23	35.4%
	Total	65	100%

Table 10: Will you switch to an electric vehicle if the company offers an exchange value on your owned vehicle to buy an electronic vehicle?

In Table 10, the respondent was divided into 3 groups based on the willing to switch to an electric vehicle if the company offers them an exchange value. The frequency and percentage of the respondents are shown in table 10. Out of 65 respondents, 38 respondents (58.5%) selected yes to switch, 4 respondents (6.1%) selected no to switch and 23 respondents (35.4%) selected may be to switch. This has been explained in graph:9 below.

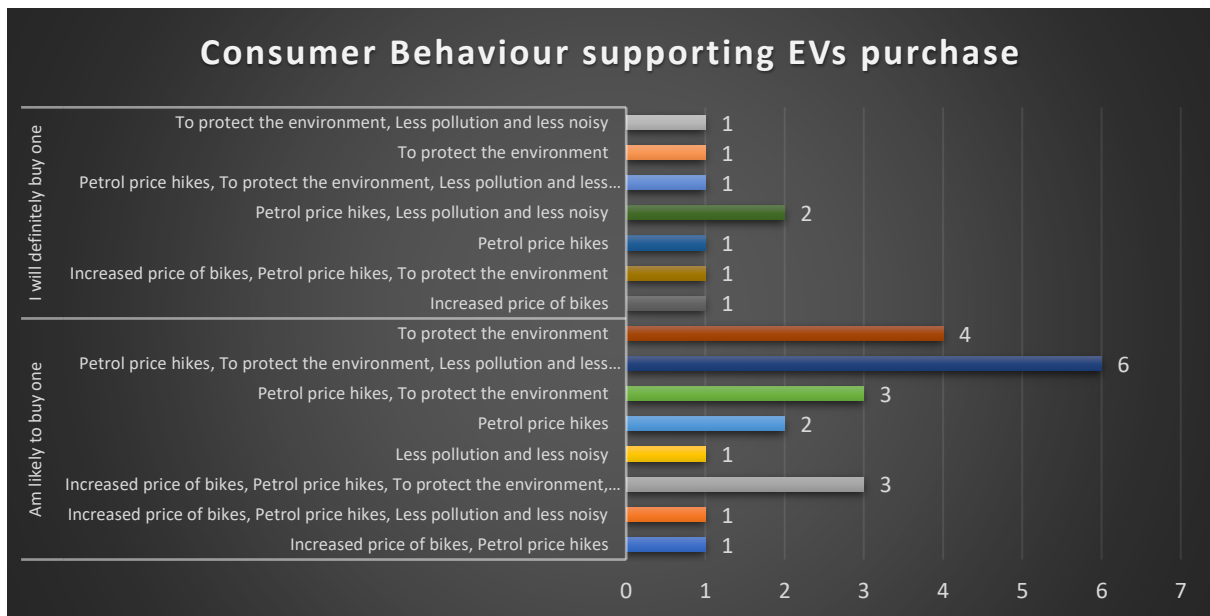


Graph 9

CHAPTER 4

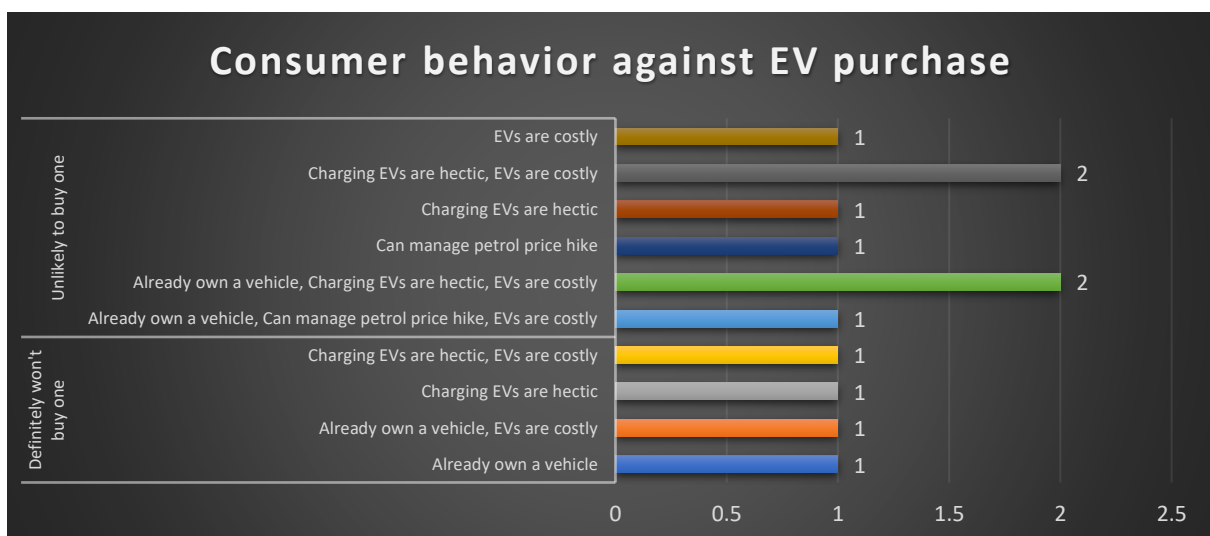
FINDINGS

The objective of this study was to understand the buying behaviour of consumers towards electronic vehicles. This was done keeping in mind the basic characteristics of respondents, over certain parameters. The study identifies 65 respondents for this study. This chapter highlights the major findings and conclusion of the study.



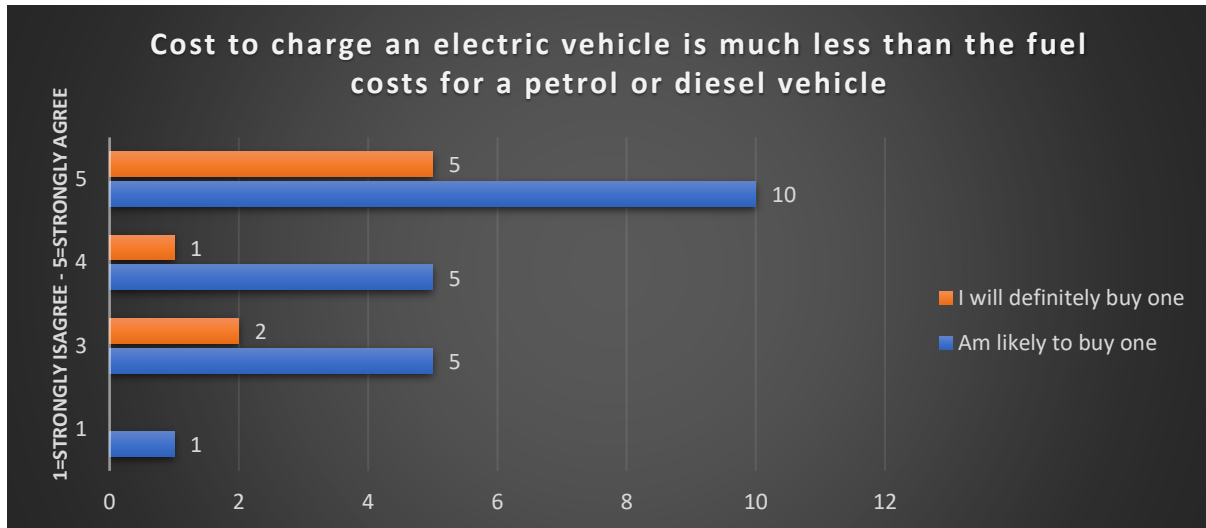
Graph 10

Petrol price hikes, increasing prices of bikes are the major concerns of consumers who are willing to switch to electric vehicles. Electric vehicles causing less pollution and noise is also a major reason why consumers are wanting to switch, which in a way they believe will protect the environment.



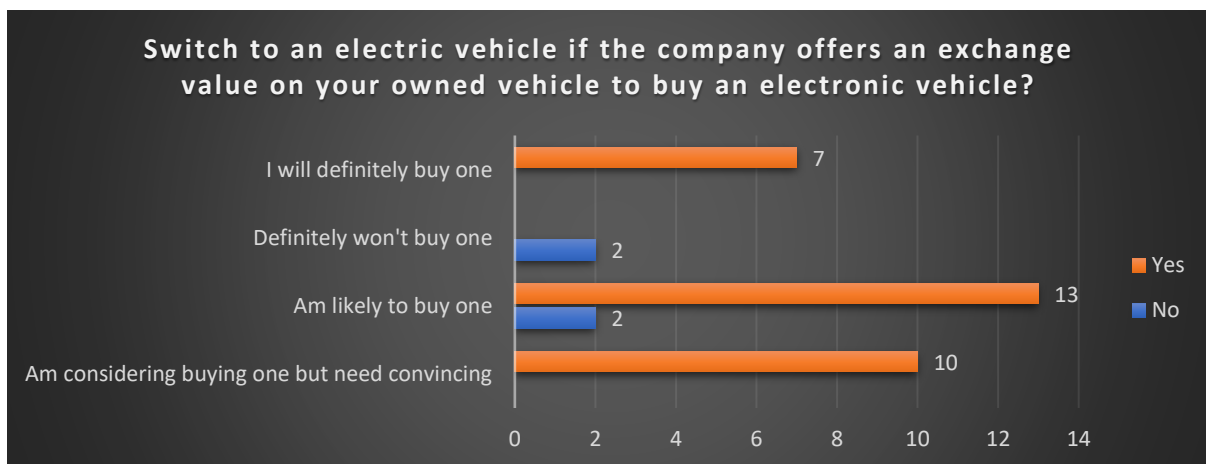
Graph 11

The major reasons consumers are against EV purchases are they feel that charging electric vehicles are costly and charging electric vehicle on a daily basis is hectic. The ones who already own a vehicle are not willing to switch to an electric vehicle as there is a switching cost involved in this process. Some consumers also find petrol prices manageable hence, not wanting to switch.



Graph 12

The majority of consumers strongly agree that the cost to charge an electric vehicle is much less than the fuel costs for a petrol or diesel vehicle and hence they are willing to buy an electric vehicle or switch to one.



Graph 13

The consumers who want to have an electric vehicle are also willing to exchange one with their owned vehicle provide the company provides them with an exchange value. Some also feel they might exchange their vehicle with an electric vehicle if they are motivated enough towards buying an electric vehicle. This can be done through awareness campaigns and advertisements. However, some are completely against exchanging their owned vehicles as they have emotions attached to them.

CHAPTER 5

CONCLUSION

Majority of the ones who are inclined towards buying an electric vehicle are concerned about the pollution caused by internal combustion engines and want to protect the environment. Petrol price hikes are also an alarming situation to them and that is a significant reason for them wanting to shift to EVs. The ones who are likely to buy an EV are also interested in buying if the company offers an exchange value on their owned vehicle to buy an electronic vehicle. They also believe that the cost to charge an electric vehicle is much less than the fuel costs for a petrol or diesel vehicle. But also feel charging an EV is hectic. The major reason behind the slow growth of the EV industry in India is the lack of infrastructure and lack of charging pumps which is why a majority of consumers are against EV purchases. Also, there lack of awareness among consumers towards EVs. Better infrastructure, awareness campaigns, promotional activities of electric vehicles will surely help this industry penetrate the Indian automobile market.

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ANNEXURE

1. Name?
2. Gender?
 - Male
 - Female
3. Age group?
 - Under 25
 - 25-35
 - 36-45
 - 46-55
 - Above 55
4. Qualification?
 - Undergraduate
 - Postgraduate
 - Diploma
5. How likely are you to consider buying an electric vehicle in the next 2 years?
 - I will definitely buy one
 - Am likely to buy one
 - Am considering buying one but need convincing
 - Unlikely to buy one
 - Definitely won't buy one
 - Don't know
6. Why are you willing to switch to an electronic vehicle?
 - Increased price of bikes
 - Petrol price hikes
 - To protect the environment
 - Less pollution and less noisy
7. Why are you not willing to switch to an electronic vehicle?
 - Already own a vehicle
 - Can manage petrol price hike
 - Don't like riding EVs
 - Charging EVs are hectic
 - EVs are costly
8. The cost to charge an electric vehicle is much less than the fuel costs for a petrol or diesel vehicle
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

9. Electric vehicles cost about the same to buy as petrol or diesel vehicles
 - Strongly Disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly Agree

10. Will you switch to an electric vehicle if the company offers an exchange value on your owned vehicle to buy an electronic vehicle? *
 - Yes
 - No
 - May be