



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact Factor: 6.078

(Volume 7, Issue 5 - V7I5-1366)

Available online at: <https://www.ijariit.com>

Preference and adoption towards electronic vehicles among youngsters

George Sebastian

georgesebastian@kecollege.ac.in

Kuriakose Elias College, Mannanam, Kerala

ABSTRACT

Road transportation is the preferred mode of transportation in India. Using conventional fuel vehicles has led to pollution and global warming. The production of electric vehicles and their related components are anticipated to increase share of manufacturing in GDP to over 24% by 2022-23. The study is evident that preference for electric vehicles is increasing especially among youngsters. They are aware that EV has better performance and low operating cost. Their concern is regarding lack of charging stations and high initial cost of the vehicle. Companies only have a few EV models, and customers have very limited choice.

Keywords: EV, Hybrid, Green tax, FAME etc.

1. INTRODUCTION

A common need to travel from one place to another in search of life, vocation, education and joy. Various modes of transportation have helped in the last few centuries to make life faster. India has third-largest road network in the world were travelling through road seemed to be the preferred choice for over 50% of the common man. Different vehicles we use today produce toxic gases, dust and leads to global warming. Our central Government has initiated several policies, to discourage the use of polluting conventional cars. Imposition of Green tax while re-registering the vehicle after 15 years is one such policy. Increased fuel taxes may enlighten the consumers to buy fuel-efficient or electric cars, or better not to drive. Awareness and promotion regarding EV must be fostered through government policies and support of companies and media.

2. FAME INDIA SCHEME 2015 and NEMMP 2020

The FAME India Scheme stands for Faster Adoption and Manufacturing of Electric vehicles. It aims at promotion of electric vehicles. It also gives financial incentives for gearing EV manufacturing and the creation of infrastructure. It was launched in 2015 by the Ministry of Heavy Industries and Public Enterprises.

NEMMP 2020 is a National Vision to faster adoption of EVs and its production in our country. National Electric Mobility Mission Plan (NEMMP) has been designed to raise fuel security, to advance to eco-friendly transportation, and to attain manufacturing leadership globally in electric vehicles.

3. NEED OF THE STUDY

While we live in times of great concern for environment and shortage of fuels, Electric vehicles have a role to play. All market studies show that preference and adoption of electric vehicles are growing. It helps us to acquire fuel security and advance to eco-friendly transportation. Import of crude oil can also be reduced with increasing scope for EV. Youngsters must understand the uses of Electric vehicles and prefer to use such vehicles. The study is significant in identifying preference of youngsters over various types of vehicles.

4. REVIEW OF LITERATURE

Kishore, Shweta & John Vieira, Dr & Tupe, Omkar (2021) Automobile sector in our country consider Electric Vehicles as an answer for questions regarding current depletion of fuels and price hike. However, now the market penetration is relatively low than expected. Potential scope of EV is studied and consumer perception is analysed through this paper.

Ng, Tian. (2021), Fuel vehicles lead to emission of toxic gases, contamination of fossil fuels and increase in world temperature to a higher level. A clean and affordable transportation system can bring down all these global problems. To bring down gas pollution in vehicles, to create a green, sustainable environment, and to stop the depletion of energy resources, humanity has to consider EV as an alternative.

Tu, Jui-Che & Yang, Chun (2019), EV market in China has flourished quickly, making China the global electric vehicle market. Research on all aspects of electric vehicles is highly necessary. It has a reference value for other countries to develop their electric vehicles market.

Muniamuthu, Sumathy & Arjun, S. & Jalapathy, M. & Harikrishnan, S. & Vignesh, A. (2018), We could witness large amount of switch from pollution causing fuel automobiles, to pollution free EV cars are eventually increasing. My review aims to study reports, articles, journals, statistical data and blogs to bring forth the preference of electric vehicles. Some major limitations of electric vehicles and its infrastructure were analysed to render solutions. The boosting demand for electric vehicles, government policies and plans to foster the usage were also analysed. The journal concludes that producing green electricity and usage of EV will help to create a pollution free, depletion free, sustainable environment in the near future.

Fanchao Liao, Eric Molin & Bert van Wee (2017) By encouraging the adoption of EVs helps in lessening environmental pollution, oil dependency, fossil depletion and global warming. A comprehensive review of works and papers on consumer preferences for Electric vehicles give path and direction for further research. The economical approach towards awareness and preference for Electric vehicles were compared. The financial and technical features of Electric vehicles is generally found more significant, including its initial and service cost, speed and performance and availability on the market. The density of electric charging stations positively affects the promotion of EV.

Udaeta, Miguel & Chaud, Carolina & Gimenes, André & Galvao, Luiz. (2015), the aim of the study was to evaluate electric mobility over time. Focus was laid on the development of the hybrid and electric car. The following were the variables which determine performance of EVs, assessment of acceleration and speed, analysis of facts related to source of energy and distance travelled. Analysis was conducted from 1930s to the first decade of this century. In the initial stages, the penetration of the electric vehicle was commercially harmed due to limitations of batteries and its capacity. There have been regular updation and improvements in all the features and attributes, demonstrating the maturity of EVs.

5. OBJECTIVES

- To analyse preference of customers on various types of vehicles.
- To evaluate the factors that lead to selecting an electronic vehicle.
- To point out the factors limiting customers in buying electric vehicles.
- To test the relationship between income of respondents and their preference over types of vehicles.

6. METHODOLOGY AND TOOLS

The study is analytical in nature. 164 samples were collected from employed youngsters who are using cars at present. Stratified random sampling was used in collecting samples. Samples were collected from various professionals and employees who vary in income, living standard and educational qualification. A questionnaire was circulated among the respondents and data were analysed in detail. Secondary data was collected from published journals, edited books, travel magazines and internet websites.

Tables were used for presentation of data and percentage study, cross tab and Chi-square test were used for analysis. The relationship between two attributes (Income and Preference) were analysed and chi square test is best suitable for the situation.

7. ANALYSIS AND INTERPRETATIONS

7.1 Income level of respondents

Annual income level of respondents was collected and presented in table in 1. Majority of the respondents (37%) earn more than 5 lakhs, 32% earn between 1 and 3 lakhs, 27% have an income between 3 to 5 lakhs and remaining 4% earn below 1 lakh.

Table 1

Education of respondents	No. of respondents
Below 1 lakh	07
1 lakh – 3 lakhs	51
3lakhs – 5lakhs	45
Above 5 lakhs	61
Total	164

(Source: primary data)

7.2 Preference over various types of vehicles

A study was conducted to evaluate the customer preference over various types of vehicles. Out of the total of 164 respondents, 76 (46%) prefer conventional fuel vehicles and balance 88(54%) prefer electric vehicles. Survey results are given in table No. 2

Table 2

Customer Preference	No. of Respondents
Conventional Fuel vehicle	76
Electric Vehicle	88
Total	164

(Source: Primary data)

7.3 Factors for selecting an Electric Vehicle

Various factors that lead to selection of an electric vehicle were analysed during this study. 37% of the respondents opt increasing fuel cost as the reason, 35% opt high performance, 20% due to their concern for environment, 7% opt low service expenses and only 1% opt financial incentives from Government. For survey results see Table No.3

Table 3

Factors Influencing Customers	No. of Respondents
Increasing fuel cost	61
High performance	58
Concern for environment	32
Low service expenses	11
Financial incentives from Government	2
Total	164

(Source: Primary data)

7.4 Factors Limiting customers from buying electric vehicles

Various factors that limit customers from buying an electric vehicle were analysed as a part of the study. 33% of the respondents opt limited charging stations as the reason, 32% opt high cost of vehicles, 21% opt limited selection of models, 7% due to more time for charging and expensive battery replacement respectively. For survey results see Table No.4

Table 4

Factors Limiting Customers	No. of Respondents
Limited charging stations	55
High cost of vehicles	52
Limited selection of models	33
More time for charging	12
Expensive battery replacement	12
Total	164

(Source: Primary data)

7.5 Cross tab of Income and Customer Preference

Setting up of hypothesis

H0: There is no significant relationship between income of respondents and their preference.

H1: There is significant relationship between income of respondents and their preference.

$$\text{Test statistic: } X^2 = \sum (O-E)^2/E.$$

$$\text{Degree of freedom} = (r-1)(c-1) = (2-1)(4-1) = 1*3=3$$

Level of significance= 5%

Test criterion; Accept H0 if X² is less than table value

Table 5

	Conventional fuel vehicle	Electric vehicle	Total
Below 1 lakh	4	3	7
1 lakh- 3 lakhs	38	13	51
3 lakhs – 5 lakhs	26	19	45
Above 5 lakhs	8	53	61
Total	76	88	164

(Source: Primary Data)

$$X^2 = \sum (O-E)^2/E = 44.65$$

7.6 Chi- Square values

Table 6

	Value	Level of Significance	Degree of Freedom
Chi-Square distribution (Table Value)	7.815	.05	3
Calculated X ² Value	44.65		
Number of Valid Cases	164		

(Source: Table 5)

Inference: Since calculated value (44.65) is greater than table value (7.815), we reject H0 and accept H1. There is significant relationship between income of respondents and their preference over various types of vehicles.

8. FINDINGS

The study shows that the preference of Electric vehicles has risen during the past decade. Majority of the respondents (54%) prefer electric cars over fuel cars. Increasing fuel cost and better performance of electric cars are the factors that influenced majority of customers to prefer electric vehicles. Less number of charging stations and high initial cost of Electric vehicles limits majority of

customers from buying EV. It was also analysed that there is significant relationship between income of respondents and their preference over various types of vehicles.

9. CONCLUSIONS

Electric vehicles are beneficial in tackling increasing demand for fuels and increased global temperature. Ecological concerns are growing day by day. Electric vehicles have a role to play in creating a sustainable mode of energy. Governments should also promote electric vehicles by providing subsidies and installing charging stations all throughout the nation. This will reduce initial cost of electric vehicles and increase its sales. Also, people should be made aware that electric vehicles have low operating and service cost. Companies should avail more electric models, so that customers can choose from them.

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