European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

Determining the Purchase Reasons Behind the Acceptance of Electric Vehicles in the Indian Automobile Market

Subhash Chander Arora[1], Nainsee Singh[1], Vitin Kumar[*], Vinod Kumar Singh[2]

[1]PhD Research Scholar, Faculty of Management Studies, Gurukula Kangri (Deemed University), Haridwar, Uttarakhand, India.

[2]Professor, Faculty of Management Studies, Gurukula Kangri (Deemed University), Haridwar, Uttarakhand, India.

Corresponding author email: sash.arora.91@gmail.com

ABSTRACT

The transportation industry, along with its associated carbon emissions, has been under constant scrutiny due to its role in exacerbating global temperatures and worsening air quality. Adoption of fuel-efficient technology, such as electric vehicles that are energy-rich and green, is crucial to solving this issue.

Objective: This research examines consumer adoption of electric vehicles (EVs) in the local Indian market, with a focus on this trend. The challenge was to learn more about the factors that drove people to embrace this new environmentally friendly technology.

Methodology: 266 current EV owners (of any brand) were given a questionnaire as part of the study, which asked them about their reasons for buying EVs and whether or not state agencies' and the government's transportation-related policies had encouraged them to act more sustainably.

Findings: The data was analysed with the help of SPSS and the results of Exploratory Factor Analysis (EFA) revealed perceived economic benefits, personal innovativeness towards EVs and subjective norms playing an important role towards EV purchase behaviour followed by driving experience, environmental awareness and moral norms of Indian consumers. Besides, several other factors were identified in open comments like favourable government policies, brand consciousness, compatibility and functional benefits in terms of comfortable and noiseless driving which tend to drive the decision of Indian consumers towards buying EVs.

Novelty: This study is relevant and fulfils the underlying gap in the existing literature related to actual motivations that consumers look for before buying a high involvement product such as EVs.

Keywords Transportation; electric vehicles; environment; pollution; purchase motivations; purchase decision.

1. INTRODUCTION

The COP-27 held in Egypt discussed the severity of changing climatic conditions that the world may witness few years from now and pitched the partner countries to take urgent actions so as to restrict the global warming to below 2° Celsius and precisely below 1.5° Celsius compared to pre-industrial levels [1]. The transportation sector contributes roughly twenty five percent to global energy demand [2] and twenty three percent to global carbon dioxide emissions [3] and this share is expected to increase to fifty percent in the forthcoming years. Moreover, road transport is the principal emitter with contribution of nearly seventy five percent to urban air pollution [4].

Lowering energy use and reducing reliance on fossil fuels are crucial social and economic goals [5]. Many new products and advancements have hit the market recently, enabling customers to demonstrate their environmental behaviour and accomplish the aforementioned goals. To achieve subsequent rebound effects, it is imperative that customers comprehend the true benefits of these transportation-related advances, such as electric vehicles. Customer acceptance is essential for technological advancements to occur and result in a successful and sustainable transportation system in the future.

For a country like India which is densely populated and relies heavily on foreign nations for its domestic crude oil demand, it is necessary that alternative sources of energy generation and procurement should be exploited. India has been witnessing increased number of new private vehicle registrations on a year-on-year basis [6]. As per statistics, the total registration in passenger vehicles category stood at 2,386,316 in last fiscal [7]. Literature on pro-social behaviour advocated limiting the use of private cars and imbibe energy conservation measures by urging individuals to restrain their

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

egoistic tendencies in favour of collective benefits to the society [8]. Although this rising demand for new vehicles is adding to the economic growth of the country yet in the longer run, it will prove to be unsustainable in the form of high pollution from ICE vehicles and resultant health consequences [9].

Consumers in India have still not welcomed the electric automobile technology with much enthusiasm and the current Indian EV industry is still being categorised in an early adopter stage [10]. The Indian Government has been proactive in inculcating a spirit of environmentalism among the domestic consumers to make them purchase EVs [12]. This is evident from the Phase-II of FAME scheme adopted under the National Electric Mobility Mission Plan passed by the Union government (Ministry of Heavy Industries) to promote the EV culture in the Indian domestic transportation market and to reduce the dependency upon the fossil fuels such as petrol and diesel [13].

However, the EV industry is prone to many challenges occurring both on the demand (buyers of EVs) and supply side (automobile makers, innovators and government) of the market and comprises building, expanding and meeting market sentiments which are presently well-served by the conventional vehicular technology [14-15]. In light of these challenges, an eye on statistics reveals the discomforting numbers. Although demand for electric 2W and 3W (considered to be the low hanging fruits of the Indian EV industry) continues to show upward swing with monthly registration in February'23 amounting to 65,572 and 35,657 respectively, the volume for electric cars is nowhere near to that number with total registrations in the month of December'22, January'23, February'23 around 3,739 3,346 and 4,164 respectively [16].

Taking this into account, the purpose of this research was to understand what made consumers to buy these electric cars and whether backdoor policies encouraged them to perform this behaviour. Previous empirical studies have revealed several reasons behind consumers adopting EVs such as financial benefits, technological enthusiasm and environmental values [17]. However, how these reasons cluster to form predisposition in the minds of consumers is yet to be studied in the context of a developing nation such as India. Thus, this paper attempts to examine the dimensions of such predisposition and what made consumers to buy EVs in the Indian context. To do so, we carried out a survey with current users of electric vehicles in India.

2. THE SUSTAINABLE ADOPTION AND BEHAVIOURAL THEORIES

Much research related to pro-environmental adoption behaviour of consumers is based on cognitive and normative theories [18]. This includes the classic theories such as theory of planned behaviour in 1991 by Ajzen and theory of reasoned action by Ajzen and Fishbein in the year 1980. TRA says that individual's attitude is determined by the consequences of performing a certain behaviour [19]. Social norms, on the other hand, are the result of how an individual perceives the expectations of the external environment of which she or he is a part [20]. This includes the friends or family members or people in the society. The theory holds that intentions are the best predictors of behaviour or leads to actual behaviour [21].

TPB is an extension of TRA and adds another variable (perceived behavioural control) to predict these intentions. PBC signifies how individual perceives the given action and whether it is easy or difficult to perform a certain behaviour. Existing literature on TPB confirmed the positive influence of attitude, social norms and perceived behavioural control on purchase intention of consumers towards organic products [22], smart home devices [23] and other green products like EVs [24].

The succeeding work is based or derived from a standard or norm. It includes Schwartz's Norm Activation theory of pro-environmental behaviour [25]. This theory sees personal norms or moral obligation to act in a certain way, as the major determinant of environment friendly behaviour and neglects the role of intentions in performing the intended behaviour [26]. Moreover, these personal norms are the result of two aspects: awareness of consequences and ascription of responsibility [27].

This has been followed by New Environmental Paradigm advocated by [28]. It consists of a system of core values to preserve the biodiversity and respect for the natural environment. For instance, Stern and colleagues developed the Value Belief Norm (VBN) framework to measure the green behaviour of consumers. All these theories have been widely used to research upon the green consumption behaviour of different consumer groups by emphasizing the importance of values, beliefs and norms that lead to pro-environmental action [29].

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

2.1 DIFFUSION OF INNOVATION AND CONSUMER FRAMEWORK

The DOI framework is aptly used in the context of new innovations [30]. It is said that any eco-innovation usually follows a normal distribution concerning time and space which implies that initially it is the early adopters who receive the innovation. The associated innovation diffusion theory argues that consumers' perception of the associated characteristics (five in total) of the innovation helps explain the rate of adoption among potential consumers: *relative advantages* is the degree to which an innovation is better than its counterparts; *compatibility* is the degree to which an innovation is consistent with the values and thoughts of an individual; *complexity* is the degree to which an innovation is difficult to use or require extra efforts; *trialability* is the degree to which an innovation is available to use before actual buying and *observability* is the degree to which the results of the innovation are visible to others. The framework pointed out that these perceived characteristics explain most of the variance (49-87%) in adoption rates [31].

From the above discussion, it is clear that consumers' basket contains multiple dimensions while purchasing goods especially innovations such as EVs. Hence, an investigation of purchase motives requires an overall understanding of both these dimensions. In this study, the authors have tried to investigate both these dimensions and other related reasons like personal meaning they attach to products while buying green energy technology such as EVs.

3. THEORETICAL BACKGROUND AND EV PURCHASE MOTIVATIONS

Past researchers identified various motivations that plays an important role in purchasing alternative fuel vehicles. However, most of these studies are being conducted in Western and European countries like USA, UK and some developing countries like China where studies of hypothetical preferences are being carried out [32]. This section therefore, draws out a summarized view of various motives that actually led individual customers to opt for EVs in various global markets.

To start with, the various constructs chalked out can be categorised into six main themes. Study by [33] revealed the presence of perceived economic benefits s in terms of low operating or running cost of EVs as a potential reason for consumers going for EV adoption. As per Rogers, the specific benefits that an innovation offers than its counterparts influence an individual to purchase it. It is believed that these new characteristics are critical to accept or reject an innovation. In particular, these aspects are analysed and evaluated in terms of cost, maintenance, performance like acceleration and power and the fashion trend that it commands. Moreover, absence of parking fees, freedom of driving in reserved lanes thereby avoiding traffic congestion caused by traditional vehicles, is also seen as a potential benefit [34].

Past studies found out the impact of environmental awareness towards the purchase of green products. A special term by the name of *environmentalists* was being coined for the people in USA for being environmentally aware, consuming fewer natural resources and taking actions for protecting the biodiversity [35]. People like to showcase their greenness by using and driving sustainable vehicular innovations such as hybrid or battery operated EVs. They believe that other people will notice the behaviour and will drift towards the green image of these vehicles.

Study by [36] noted the influence of subjective norms on the purchase intention of Indian consumers towards EVs. People tend to buy green products so as to conform to the norms of the society of which they are a part. Consuming goods that the society is advocating has an important impact on an individual's decision to buy certain products. New products entering the market always catch the attention of certain consumer groups. As per diffusion of innovation theory, a product penetrates the market gradually with early adopters embracing the technology first and then it slowly transcends into other segments of the society. This initial group is the trendsetter for new innovations and are attracted to buying goods as soon as they enter the market. Study by [37] found the positive impact of consumers' innovativeness towards EV purchase adoption.

Besides social norms that are externally driven, moral norms are purely intrinsic in nature and influence an individual to take responsibility for performing certain behaviours. It holds importance in psychological matters and is considered as the foundation of Norm Activation Model. People who are internally motivated and understand their responsibility towards the environment are better viewed as potential EV buyers [38]. As per the Construal level theory [39], psychological distance of consumers from certain products leads to abstraction of products. Past studies identified the positive influence of pre-purchase driving experience on the adoption decision of EVs. According to drivers' feedback, first-hand experience may significantly change people's opinion with regard to EV purchase decision and can actually lead to actual adoption. Based on this empirical literature, it can be stated that there are multiple factors that affect an individual's decision to purchase EVs in the market. A total of 24 dimensions have been identified (given in Table 1) which affected the consumers' decision to purchase EVs in varied world markets.

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

Table 1 Motivational and purchase reasons identified in existing literature.

Consistent with group norms	Rising temperatures
Awareness about climatic events	Early adopters
Adoption of new innovations	Noise pollution
Trialability	Responsible behaviour
Green movement	Rising petrol prices
Air pollution	Compassion towards others
Operational savings	Social acceptability
Symbolic meaning	Doing the right thing
Government incentives/policies	Cheaper electricity
Separate lanes	Zero parking fees
Depleting natural resources	Technology enthusiast
Sharing community values	Favourable experience

This shows the extant literature that has been being identified and examined from time to time by different studies. However, we are interested in identifying dimensions that made consumers to adopt EVs in the Indian market. By undertaking this investigation, the current work tends to provide a holistic view of actual reasons that propelled the intake of EVs in the Indian automobile market and adds to the scant literature in this regard. Thus, this study broadly has the following objectives: to understand what dimensions comes into play in the current consumer EV purchase behaviour in the domestic market; to find out whether there are other reasons that are peculiar to the Indian automobile market which influenced consumers to adopt this technology and lastly, to analyse the impact of this behaviour on local policies.

4. METHODOLOGY

To achieve the purposes of our study, the authors decided to shoot a questionnaire among the consumers who have purchased any EV variant (hybrid or battery) in the domestic automobile market such as TATA Nexon, Hyundai Kona or any other electric car in the past two years. The reason why the purchases during the last two years have been considered is that since the pandemic, people have realized the true value of a healthy environment and how they have been responsible for degradation of the environment over the last many years. Moreover, the EV industry is still in an infant stage and is facing many hardships since its commercialization especially the impact of covid-19, therefore better understanding of EV market is required post-pandemic. To carry out the research, survey method was deployed as it enables information-seekers to gather large amount of data in a short period of time. Moreover, the survey also took care of gathering other motivational constructs that may play a significant role in the Indian EV market. To take care of this, use of single open-ended question was done.

4.1 DATA COLLECTION

In EVs case, the phenomena behind low commercialization is still not fully understood and thus, the coding or themes derived from the data in open-ended way could help us understand and explore the subject better for future market success. Although, the authors were aware that such information comes more precisely by conducting in-depth interviews but to gather large responses and to statistically check the results, questionnaire method was deemed appropriate. The instrument for collecting data was in operation for two months during Oct-Nov 2023 in metropolitan cities of Bengaluru Gurugram and Mumbai. The reason for selecting these is because of their consistent poor air quality and high EV registrations.

The authors also consulted the designated outlets of some companies and briefed them about the nature of study and the proposed objectives. The concerned staff helped with specific details about the technology and the overall atmosphere for these cars, how the consumers are reacting to it and how future forecast looks favourable despite the negative externalities all around. Specific features of the consumers buying these cars were also determined like young and mid-size generation in the age bracket of 35-50 years old, who are financially strong, believe in the goodwill and brand of the company and are somewhat aware of the rising pollution level because of the current transportation sector in general and personal vehicle use in particular. This was a boon for the present study as the authors were overwhelmed regarding the minute details that were disclosed by these automobile outlets. Based on that, questionnaire was forwarded to 500 electric car consumers in physical mode and a response rate of 49% was accomplished (246 surveys received back). However, after removing the outliers and unfinished questionnaires, only 209 responses were considered as complete and hence relevant for further analysis.

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

The final questionnaire is given at the end of this study (Table 7). It consisted of three parts; the first section collected the demographic details of the target respondents; the next section talks about the proposed reasons underlying the buying of electric cars by the target consumers (the first objective). Respondents were asked to describe in their own words as to why they preferred EVs over conventional vehicles (second objective). This was codified later into factors and is available in Table 6 below.

The third section asked necessary information on Likert scale based on the constructs identified in existing literature. The items were taken from the previous literature and was modified by the authors based on the advice of domain experts in academia and industry. These questions were framed in such a way so as to reveal the current dimensions being identified in the existing literature on EV purchase motivations.

5. RESULTS

As is evident from Table 2, the majority of the respondents were found to be men in the age group of 35-50 years with sound literacy and financial background. The demographic details of the respondents are being given below:

Table 2 Demographic Profile of EV consumers (n=209)

Items	Classification	Frequency	Percentage
Gender	Male	132	63.10
	Female	77	36.90
Age	18-25	21	10.10
	26-35	69	33.00
	36-50	88	42.10
	Above 50	31	14.90
Education	Intermediate	22	10.90
	Graduation	97	46.20
	Post-Graduation	56	27.00
	Above Post-Graduation	34	15.90
Annual Household Income	Upto INR 5,00,000	28	13.50
	5,00,000-10,00,000	132	63.50
	Above INR 10,00,000	49	23.00

EFA was done using PCA extraction method to obtain the desired number of factors and the number of factors were obtained using latent root criterion. In total, six factors were obtained clustering a total of 22 variables/items with a total variance explanation of 62.165 percent. Table 3 shows the individual variance and the total variance explained while table 4 shows the items revealed under each of these factors.

Table 3 Factors obtained with Eigen Value more than 1.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.321	24.186	24.186	5.321	24.186	24.186	2.719	12.361	12.361
2	2.415	10.976	35.162	2.415	10.976	35.162	2.457	11.167	23.528
3	1.985	9.022	44.183	1.985	9.022	44.183	2.312	10.511	34.038
4	1.711	7.778	51.961	1.711	7.778	51.961	2.261	10.279	44.318
5	1.187	5.394	57.355	1.187	5.394	57.355	1.999	9.085	53.402
6	1.058	4.810	62.165	1.058	4.810	62.165	1.928	8.762	62.165

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

7	.862	3.918	66.083						
8	.771	3.507	69.589						
9	.684	3.111	72.700						
10	.637	2.896	75.596						
11	.616	2.799	78.395						
12	.574	2.611	81.006						
13	.574	2.609	83.615						
14	.508	2.309	85.924						
15	.488	2.218	88.142						
16	.444	2.020	90.163						
17	.429	1.950	92.113						
18	.418	1.900	94.013						
19	.376	1.709	95.722						
20	.349	1.585	97.307						
21	.306	1.390	98.697						
22	.287	1.303	100.000						

Extraction Method: Principal Component Analysis.

Table 3 and 4 aptly describes the number of factors that were obtained with the help of SPSS software. The questionnaire used 22 metric items in total from the existing literature that reflect different motivational constructs identified in the existing literature. The principal component analysis clustered these 22 variables under 6 factors as can be evident from Table 4. The detailed overview of these six factors have been discussed below:

Table 4 Rotated Component Matrix table generating six motivational constructs.

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
PEB1	.703					
PEB 2	.602					
PEB 3	.704					
PEB 4	.721					
PEB 5	.769					
PI1		.719				
PI 2		.723				
PI 3		.760				
PI 4		.700				
EXP1				.778		
EXP2				.733		
EXP3				.800		
EXP4				.615		
SN1			.836			
SN2			.720			
SN3			.794			

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

EA1					.647	
EA2					.704	
EA3					.760	
MN1						.775
MN2						.633
MN3						.702

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Factor 1 is related to the perceived economic benefits that individuals derived from driving an electricity powered automobile. It describes the financial benefits of driving an eco-friendly car in terms of reduced expenditure on buying expensive petrol/diesel and instead using cheap electricity for daily mobility needs and other commute purposes. In a UK based study, it was concluded the promising environmental benefits of EVs as a major motivator behind people accepting this technology.

Factor 2 is associated with personal innovativeness of Indian consumers towards this innovation in the domestic market and the technological enthusiasm of certain sections of the population. It highlights the favourable inclination of consumers towards adopting new technologies available in the market and consumers' belief that controlling these new EVs is within their reach and that it is no different from conventional cars. Factor 3 described social norms and individual desire to comply with the norms of the society. This includes friends, family members, peers and others members of the community. This entourage has a significant role to play in an individual's purchase choices.

Factor 4 identified the significant influence of trialability in shaping the minds of consumers to purchase EV instead of a traditional vehicle. This is especially important in case of high-priced products like EVs and the related sceptics with this technology. This experience helped consumers regarding the functional aspects of technology like comfort, safety, easiness and the noiseless engine of EVs. This also helped in reducing the perceived fear to a certain extent and ultimately made it as their preferable choice.

Factor 5 describes the environmental awareness of Indian consumers towards the rising pollution levels in their respective cities and the threat of climate change looming large. These people act as environmentalists, spread words regarding how the environment is being threatened due to anthropogenic activities and make purchase decision that contributed to environment protection. They tend to make green choices in their daily lives and consider the carbon footprint of individual products. Factor 6 discussed the important role that inner conscience plays in purchase decision of consumers. These norms initiate one's pro-social behaviour like consumption of green vehicles. People who are not self-serving and understands their responsibility towards the environment are likely to purchase EVs as against traditional fuel vehicles.

5.1 QUALITATIVE ANALYSIS

Besides the relevance of the above factors that were determined in the previous literature and studied in our investigation, the current research also aimed to inquire into the other reasons that made consumers to buy electric car (any brand) as their preferred choice.

Table 5 Results from Binary Factor Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.369	17.107	17.107	1.369	17.107	17.107	1.158	13.479	13.479

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

2	1.135	14.183	31.290	1.135	14.183	31.290	1.140	12.251	25.730
3	1.129	11.911	43.201	1.129	11.911	43.201	1.116	11.179	36.909
4	1.104	9.301	52.502	1.104	9.301	52.502	1.097	11.081	47.990
5	1.069	9.285	61.787	1.069	9.285	61.787	1.078	10.473	58.463
6	1.036	8.579	70.366	1.036	8.579	70.366	1.059	9.407	67.870
7	1.022	7.917	78.283	1.022	7.917	78.283	1.048	9.335	77.205
8	1.010	6.570	84.853	1.010	6.570	84.853	1.023	7.648	84.853
9	.801	5.517	90.370						
10	.618	4.722	95.092						
11	.218	3.006	98.098						
12	.209	1.902	100.000						

Extraction Method: Principal Component Analysis.

To start with, initial coding was undertaken with the acquired data so as get familiar with it. After this, line by line coding was done to refine the codes and get deeper insights by coding each line or sentence. Since, automated coding can prove to be ineffective many a times, the authors indulge into the human-based coding so as to minimize technical error. The responses were coded with the help of Binary Factor Analysis and an ***8-factor solution*** was chalked out explaining 84.853 percent of the total variance. Table 5 and 6 presents the determined factors with individual variances along with the constructs obtained under each of these factors.

Table 6 Composition of factors.

Factors	Codes
Factor 1	low running costs
	cheap electricity
	rising fuel prices
Factor 2	noiseless machine
	comfortable car
	stylish
Factor 3	veteran brands
	trustworthy
	credible auto manufacturers
Factor 4	family opinion
	friends' suggestion
	pro-social behaviour
Factor 5	Interest in technology
	value for money
	satisfactory performance
Factor 6	subsidised registration fees
	numerous tax incentives
	no pollution fees
Factor 7	rising air pollution
	too much noise
	degrading environment
	threat to mother nature
Factor 8	no extra efforts
	controllable
	compatible

Factor 1 describes the presence of financial and other monetary benefits that these EVs offer when compared to gasoline-based ICE vehicles. Majority of the respondents agreed that the lower operational costs of EVs is the major reason behind their adoption decision. People with high mobility needs on a daily basis are more skewed towards the purchase of EVs.

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

Compared to gasoline-based vehicles, the cost of electricity is cheaper and hence, a lot of savings can be attained in terms of lower fuel consumption.

Factor 2 reflects functional aspects like comfort level attained while driving a sound and smooth car such as TATA Nexon or Hyundai Kona. The drivers feel relaxed and composed when sitting in these cars. Commentors stated that pre-purchase riding helped them to gain a lot about the green promises, aesthetic values that these EVs offer and hence a major reason for them to actual opt for it. Factor 3 brings out the loyalty factor, reputation and the people association with these oldest and reliable brands of the country. This factor also brings out the importance of experience of driving an eco-friendly car as well as conventional cars. The majority of the respondents agreed that the market for domestic EVs is in the hands of trustworthy brands such as TATA Motors (domestic company), Hyundai and Mahindra & Mahindra and this had a significant influence on reducing the perceived fear among the buyers with regard to this technology.

Factor 4 refers to the impact or pressure that the society exerts on an individual to comply with the collective norms of the surrounding environment. Sometimes, individuals take decisions to adhere to the rules of the game and to be a part of the society. By buying an EV, they showcase their willingness to work for the social group and to satisfy their inner pride. Factor 5 brings out the important role of new fashion in the automobile market and one's belief of using this new trend. It is also an expression of self-identity and smart consumption that have minimal harmful effects. This is a case of image management. EV owners considered themselves as someone who has a taste for new technologies entering the market and their positive outlook towards using them at the earliest.

Factor 6 brings out the green push in the mobility sector and favourable policy measures brought up by the Indian and several other state governments in the form of trivial road taxes, negligible registration costs and other purchase subsidies to incentivize the EV adoption [40]. The government should play a leading role in the technical innovation alliance of the EV industry and encourage solutions to the common, critical and cutting-edge technical problems of EVs. In particular, the "electric-thermal" safety of the power battery system should be regarded as the most critical index for the development of EVs. The technological advancement of batteries, electronic controls and motors should be promoted systematically to reduce the expected efficiency loss caused by using EVs and thus to reduce consumers' perceived risk of EVs. At the same time, the government should strengthen the safety supervision of EVs and take the lead in formulating safety management measures for EVs. The government can also set up dedicated commercial insurance for EVs to compensate consumers for the loss caused by battery performance degradation and possible spontaneous combustion incident. To some extent, all of these measures can reduce the economic, functional, and physical risks of consumers during use. This is evident from the recent reduction in the GST rates on EVs from 12 percent to 5 percent and incentive of INR 10,000 per kWh for electric cars with battery size of upto 15 kWh [41]. States like Gujarat, Maharashtra, Madhya Pradesh have finalised their EV policy or about to finalize the draft EV policy in their respective states. It is expected that this will have a strong impact on EV diffusion process and will bring transformation in the transportation system of India.

Factor 7 brings out the potential threat of rising environmental pollution and people's will to work for the preservation of the same. Global temperatures are rising to alarming extent and therefore it is necessary that individual efforts are garnered so as to protect the biodiversity for the future. Majority respondents agreed that rising air pollution is a threat to humanity and can put the functioning of economies in jeopardy.

Factor 8 brings out the perception of Indian consumers towards EVs which they consider it no different form the petrol-powered vehicles. This indicated that respondents have no confusion regarding EVs being difficult to drive and would require extra efforts. They consider EVs as regular cars with difference being that they are powered by electricity instead of gasoline and that there is battery installed to run the onboard motors. Thus, all these dimensions revealed in the open category segment of the stated questionnaire highlights the different reasons that Indian consumers took into account while buying an EV. These reasons are different to a certain extent from those identified in the previous literature and in other world markets. This also suggests that consumes motivations are more complex than previously identified and concluded.

6. DISCUSSION, IMPLICATIONS AND LIMITATIONS THEREOF

The goal of this study was to get deeper insights into the various reasons as to why people chose to buy any electric car available in the Indian domestic market over other segment (ICE vehicles). The study fulfils the underlying gap in the existing literature by helping identify reasons on the basis of which consumers made their choices of different EVs. This study is distinct in its approach as it tried to understand the perspective of current users of EVs. The findings of this study

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

could be very fruitful for the automobile makers and can help the policymakers to further the advancement of Indian EV automobile industry.

6.1 THEORETICAL FINDINGS

This research offers certain interesting inferences which can be used as guidelines for promoting the widespread adoption of electric vehicles in India and other developing economies. Initially, the important role of financial benefits was derived in the two factor analyses and it strongly influenced the buyer decision to purchase an EV. Secondly, the effect of environmental degradation and people awareness of increasing environmental issues also influenced consumers decision to purchase an EV. Thirdly, society also impacts the individual decision to adopt goods and services in the market. People respond to what the society states just to be part of the broader group. This is done so as to achieve social acceptance and contribute their bit to the overall social objectives. In addition, personal innovativeness of individuals is also the reason behind people opting for EV than conventional cars. Interest in technology acted as a driving force for many respondents. This dimension is dependent upon the prior experience of drivers. One's own experience or through positive word of mouth also affects people's decision to purchase EVs. This suggests that trialability aspect of EV should not be overlooked.

Functional aspects of the technology also influenced people to choose electric cars. Reasons like comfortable to drive, easy to learn and size of the car proves this point. Expression of self-image also brings out the importance of this factor besides the green values of a consumer. By buying an eco-friendly car, personal identification of the consumer is revealed in their consumption pattern. At last, government proactive measures in the form of purchase subsidies so as to lower the initial upfront cost of EVs reflects the seriousness of the problem and its commitment to long-term environmental agenda of the Paris Agreement of 2015 and hence is being considered as an important reason for citizens to choose EVs.

6.2 IMPLICATIONS OF THE STUDY

The study has several implications for the stakeholders operating in the Indian EV industry. *Firstly*, the study brings out the important role of financial benefits being provided alongside EV purchase. This is the right time for more such benefits to be extended so as to influence those with clear intentions to have any EV as their next car choice. Proper communication of these benefits in newspapers, over social media should be done so as to make the penetration faster in next few years.

Social norms also affect consumers to buy EVs. There is a need to pinpoint the relevance of using these EVs and how they can contribute to the humanity at large. Messages should be circulated about the potential benefits of using EVs and how one individual behaviour can make a difference. People should be made aware of their responsibility towards environment, others and the society at large. Consumer education is important in this regard and should become part of the overall public policy. Targeted messages that can evoke emotions towards environment conservation can also be utilised but still the process is rather complicated with heuristics playing a major role.

Lastly, the important role of a comfortable car and how prior experience can help reduce fears or doubts connected with the technical performance and other practical aspects was also noticed in our investigation. As Rogers has pointed out that awareness about any innovation entering the market can spark the motivation to know more about it in the form of trialability experience which ultimately can lead to its future adoption. Essentially, promotion is a communication and incentive activity in which the marketing personnel sends out various information as stimuli and passes the information to one or more target objects, such as consumers or users, to affect their attitudes and behaviours. In the current automobile consumer market, the market promotional activities for target users are limitless, such as prizes awarded with sales, cashback, free service, old-car replacement, and test drives. EVs, as innovative products, necessarily require potential users to understand their performance and features. Therefore, EV test drives and other experiential activities have become a popular way of promoting EVs. Consumers' EV driving experience directly affects their perceptions and cognitions and increases their understanding of EVs, which further affects their attitudes and intentions to adopt EVs.

6.3 LIMITATIONS AND FUTURE RESEARCH AGENDA

The study is not free from limitations. *Firstly*, the current investigation highlights the important role of related advantages in both the factor analyses and the primary reason behind consumers opting for EVs. This is acceptable provided the actual cost of these savings can be revealed in further analysis and also which segment of customers is mostly likely to benefit from these financial advantages. For this, information regarding previous car ownership can be obtained and real fuel savings in terms of driving an electric car can be explored. *Secondly*, the time period is questionable. The pandemic hit the economic life hard and purchase reasons might have been different had the survey been conducted prior to the

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

year 2020. In addition, the results of this study could not be generalised and hence more sample could be collected to further explore any other unidentified reasons by visiting other demographic areas besides the ones covered in this study. To conclude, it can be said that the decision making with respect to innovation such as EVs is a multifaceted one with many underlying variables playing their individual part. Thus, what is necessary at the moment is to put in place an effective policy that can cater to the demand of the broader group and not just the early adopters or innovators.

Table 7 Questionnaire/Survey items used.

	APPENDIX	**REFERENCING**
PEB1	I will save on fuel expenses, as running cost should be lower in case of an electric vehicle	Khurana et al. (2020)
PEB2	The maintenance cost for an electric vehicle will be less.	
PEB 3	Overall cost of owning an electric vehicle will be low due to government incentives (incentives = lower road tax/less insurance premium/cheaper loan)	
PEB 4	I am fully familiar with the economic benefits offered by the electric vehicle.	
PEB 5	Electric vehicles offer considerable financial benefits compared to conventional vehicles.	
PI1	I have the attitude to experiment new technology the moment I heard about that.	Shanmugavel and Micheal (2022)
PI 2	Usually, I will be the first one to explore new technologies among my peer group.	
PI 3	I always like to experiment with new technologies	
PI 4	Electric vehicles are highly innovative comparing to the tradition vehicles	
EXP1	The driving experience of EVs is exciting	Xu et al. (2020)
EXP2	I have mastered a certain amount of knowledge about EVs through driving experience	
EXP3	I know the details of the use (e.g., charging, maintenance) of EVs through driving experience	
EXP4	The driving experience made me want to learn more about EVs	
SN1	People will react positively when they see an electric vehicle on the road	Khurana et al., (2020)
SN2	People whose opinions are important to me find electric vehicles good	
SN3	Possessing an electric vehicle would be a status symbol for me.	
EA1	I took into account the environmental consequences when I purchased the electric vehicle.	Shalender and Sharma (2021)
EA2	I think we should live in harmony with the environment for achieving sustainable development.	
EA3	I think individuals in the society have the responsibility to protect the environment.	
MN1	I believe it is my moral responsibility to reduce environmental pollution and greenhouse gases emissions.	Shalender and Sharma (2021)
MN2	I feel morally obliged to adopt EV irrespective of what others think of me.	
MN3	I take into account environment consequences while I adopt a vehicle.	
OPEN QUESTION	Why did you bought an electric car? Mention few reasons.	

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1025
http://eelet.org.uk

REFERENCES

1. Aasness MA, Odeck J. The increase of electric vehicle usage in Norway- incentives and adverse effects. European Transport Research Review. 2015, 7(4): 1-8. https://doi.org/10.1007/s12544-015-0182-4
2. Bhat FA, Verma M, Verma A. Measuring and modelling electric vehicle adoption of Indian consumers. Transportation in Developing Economies. 2022, *8*(1), 6. https://doi.org/10.1007/s40890-021-00143-2
3. Khurana A, Kumar VVR, Sidhpuria M. A Study on the Adoption of Electric Vehicles in India: The Mediating Role of Attitude. Vision. 2020, *24*(1): 23–34. https://doi.org/10.1177/0972262919875548
4. International Energy Agency. Tracking Transport 2020. IEA, Paris. 2020. https://www.iea.org/reports/transport-energy-and-co2 Accessed 22 November 2022
5. Ozaki R, Sevastyanova K. Going hybrid: An analysis of consumer purchase motivations. Energy Policy. 2011, 39(5): 2217–2227. https://doi.org/10.1016/j.enpol.2010.04.024
6. Pradeep VH, Amshala VT, Raghuram Kadali B. Does perceived technology and knowledge of maintenance influence purchase intention of BEVs. Transportation Research Part D: Transport and Environment. 2021, *93*. https://doi.org/10.1016/j.trd.2021.102759
7. Press Trust of India. Total vehicle registration in India slips 30 percent. 2022. https://economictimes.indiatimes.com/industry/auto/auto-news/total-vehicle-registrations-in-india-slips-30-per-cent-to-15271519-units-in-2020-21-fada/articleshow/82516167.cms?from=mdr Accessed 19 December 2022.
8. Degirmenci K, Breitner MH. Consumer purchase intentions for electric vehicles: is green more important than price and range? Transportation Research Part D: Transport and Environment. 2017, 51: 250–260. https://doi.org/10.1016/j.trd.2017.01.001
9. Buhmann KM, Criado JR. Consumers' preferences for electric vehicles: the role of status and reputation. Transportation Research Part D: Transport and Environment. 2023, 114, 103530. https://doi.org/10.1016/j.trd.2022.103530
10. Rogers EM. Diffusion of innovations, 5th edition. Free Press, New York. 2003.
11. Shalender K, Sharma N. Using extended theory of planned behaviour (TPB) to predict adoption intention of electric vehicles in India. Environment, Development and Sustainability. 2021, *23*(1): 665–681. https://doi.org/10.1007/s10668-020-00602-7
12. Kumar RR, Alok K. Adoption of electric vehicles: A literature review and prospects for Sustainability. Journal of Cleaner Production. 2020, *253*: 119911. https://doi.org/10.1016/j.jclepro.2019.119911
13. Bhalla P, Ali IS, Nazneen A. A study of consumer perception and purchase intention of electric vehicles. European Journal of Scientific Research. 2018, 149(4): 362-368. http://www. europeanjournalofscientificresearch.com
14. Press Information Bureau. Implementation of National Electric Mobility Mission Plan. 2019. https://pib.gov.in/newsite/PrintRelease.aspx?relid=191337 Accessed 19 December 2022.
15. Thøgersen J, Ebsen JV. Perceptual and motivational reasons for the low adoption of electric cars in Denmark. Transportation Research Part F: Traffic Psychology Behaviour. 2019, 65: 89–106. https://doi.org/10.1016/j.trf.2019.07.017
16. Dalvi A. https://www.autocarpro.in/analysis-sales/ev-sales-charge-past-100000-units-for-fifth-month-in-a-row-and-a-million-in-fy2023s-first-11-months-114323 Access 11 March 2023.
17. Egbue O, Long S. Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. Energy Policy. 2012, 48: 717-729. https://doi.org/10.1016/j.enpol.2012.06.009
18. Peters A, Dutschke E. How do consumers perceive Electric Vehicles? A Comparison of German Consumer Groups. Journal of Environmental Policy and Planning. 2014, 16(3): 359-377. https://doi.org/10.1080/1523908X.2013.879037
19. Fishbein M, Ajzen I. Belief, attitude, intention, and behaviour: An introduction to theory and Research. Philosophy Rhetor. 1977, 10: 130–132.
20. Ajzen I. The theory of planned behaviour. Organizational Behaviour and Human Decision Processes. 1991, 50(2): 179–211.
21. Arora SC, Sharma M, Singh VK. Using diffusion of innovation framework with attitudinal factor to predict the future of mobility in the Indian market. Environmental Science and Pollution Research. 2022, 30, 98655-98670. https://doi.org/10.1007/s11356-022-23149-8
22. Eberle L, Milan GS, Borchardt M, Pereira GM, Graciola AP. Determinants and moderators of organic food purchase intention. Food Quality and Preference. 2022, 100, 104609. https://doi.org/10.1016/j.foodqual.2022.104609
23. Zhang W, Liu L. Unearthing consumers' intention to adopt eco-friendly smart home services: An extended version of the theory of planned behaviour model. Journal of Environmental Planning and Management. 2022, *65*(2), 216-239. https://doi.org/10.1080/09640568.2021.1880379

24. Sahoo D, Harichandan S, Kar SK, Sreejesh S. An empirical study on consumer motives and attitude towards adoption of electric vehicles in India: Policy implications for stakeholders. Energy Policy. 2022, 165, 112941. https://doi.org/10.1016/j.enpol.2022.112941
25. Schwartz SH. Normative influences on altruism. Berkowitz Limited Edition. *Advances in Experimental Social Psychology*. 1977, 10: 189–211. Academic Press, New York.
26. Stern PC, Dietz T, Abel TD, Guagnano G, Kalof L. A Value-Belief-Norm theory of support for social movements: The case of Environmentalism. Human Ecology Review. 1991, 6(2): 81–97. https://www.jstor. org/stable/24707060
27. Schulte E, Scheller F, Sloot D, Bruckner T. A meta-analysis of residential PV adoption: The important role of perceived benefits, intentions and antecedents in solar energy acceptance. Energy Research & Social Science. 2022, 84, 102339. https://doi.org/10.1016/j.erss.2021.102339
28. Dunlap RE, Van Liere KD. The new environmental paradigm: A proposed measuring instrument and preliminary results. Journal of Environmental Education. 1978, 9(4): 10–19. https://doi.org/10.1080/00958964.1978.10801875
29. Asadi S, Nilashi M, Samad S, Abdullah R, Mahmoud M, Alkinani MH, Yadegaridehkordi E. Factors impacting consumers' intention toward adoption of electric vehicles in Malaysia. Journal of Cleaner Production. 2021, 282, 124474. https://doi.org/10.1016/j.jclepro.2020.124474
30. Xu G, Wang S, Li J, Zhao D. Moving towards sustainable purchase behaviour: Examining the determinants of consumers' intentions to adopt electric vehicles. Environmental Science and Pollution Research. 2020, 27(18): 22535–22546. https://doi.org/10.1007/ s11356-020-08835-9
31. Min S, So KKF, Jeong M. Consumer adoption of the Uber mobile application: insights from difusion of innovation theory and technology acceptance model. Journal of Travel & Tourism Marketing. 2019, 36(7):770– 783. https://doi.org/10.1080/10548408.2018.1507866
32. Krishnan VV, Koshy BI. Evaluating the factors influencing purchase intention of electric vehicles in households owning conventional vehicles. Case Study Transport Policy. 2021, 9(3): 1122–1129. https://doi.org/10.1016/j.cstp.2021.05.013
33. Song MR, Chu W, Im M. The effect of cultural and psychological characteristics on the purchase behaviour and satisfaction of electric vehicles: A comparative study of US and China. International Journal of Consumer Studies. 2022, *46*(1): 345-364. https://doi.org/10.1111/ijcs.12684
34. Roemer E, Henseler J. The dynamics of electric vehicle acceptance in corporate fleets: Evidence from Germany. Technology in Society. 2022, *68*, 101938. https://doi.org/10.1016/j.techsoc.2022.101938
35. Kahn ME. Do greens drive Hummers or hybrids? Environmental ideology as a determinant of consumer choice. Journal of Environmental Economics and Management, 2007, 54(2): 129–145. https://doi.org/10.1016/j.jeem.2007.05.001
36. Hamzah MI, Tanwir NS. Do pro-environmental factors lead to purchase intention of hybrid vehicles? The moderating effects of environmental knowledge. Journal of Cleaner Production. 2021, 279:123643. https://doi. org/10.1016/j.jclepro.2020.123643
37. She ZY, Sun Q, Ma JJ, Xie BC. What are the barriers to widespread adoption of battery electric vehicles? A survey of public perception in Tianjin, China. Transport Policy. 2017, 56: 29–40. https://doi. org/10.1016/j.tranpol.2017.03.001
38. Westin K, Jansson J, Nordlund A. The importance of socio-demographic characteristics, geographic setting and attitudes for adoption of electric vehicles in Sweden. Travel Behaviour and Society. 2018, 13: 118–127. https://doi.org/10.1016/j.tbs.2018.07.004
39. Liberman N, Trope Y, Wakslak C. Construal level theory and consumer behaviour. Journal of Consumer Psychology. 2007, 17(2): 113-117. https://doi.org/10.1016/S1057-7408(07)70017-7
40. Banerjee A. Buying EVs to get cheaper with UP EV policy. 2022. https://timesofindia.indiatimes.com/auto/policy-and-industry/buying-evs-to-get-cheaper-with-up-ev-policy-subsidies-on-vehicle-registration-fee-road-tax/articleshow/94853148.cms Access 09 December 2022
41. Niti Aayog. Electric Vehicle Incentives. 2022. https://e-amrit.niti.gov.in/electric-vehicle-incentives Accessed 19 December 2022