

## Procurement of Electric Vehicles to Reduce Transport Emission: An Empirical Study of Consumer Motivation towards Purchase Intention

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**Abstract:** Transportation is critical in contributing to the quality of life development; however, it has also negatively impacted human life and the environment with carbon emissions. Electric Vehicles (EVs) are believed to be the best solution to reduce transport emissions. The EV adoption rate in developed countries is growing annually, but in developing countries very low, especially in Malaysia. Against this background, this study aims to identify the significant factors that can influence consumer motivation toward purchasing EVs. To the best of the author's knowledge, this contribution is the first where the unified theory of acceptance and use of technology (UTAUT) was modeled with performance expectancy, effort expectancy, fuel efficiency, technophilia, and advertisement to maximize the consumer motivation toward adoption of EVs. SmartPLS has analyzed independent variables' influence in this study by drawing a conceptual framework. The data has been collected from 150 respondents inside Malaysia through online questionnaires. Results of the study revealed that all factors except effort expectancy are most important in enhancing consumer motivations. Furthermore, this research has shown the elements with the determinant of motivation and advertisement interrelated with consumer intentions towards EVs and offered managerial implications. These factors will give insights to the transportation sectors in bridging the demand and supply of EVs.

**Keywords:** electric vehicles, motivation, unified theory of acceptance and use of technology, purchase intention, sustainability.

### 采购电动汽车以减少交通排放：消费者购买意愿动机的实证研究

**摘要：**交通对于提高生活质量至关重要；然而，它也因碳排放而对人类生活和环境产生了负面影响。电动汽车被认为是减少运输排放的最佳解决方案。发达国家的电动汽车采用率每年都在增长，但在发展中国家非常低，尤其是在马来西亚。在此背景下，本研究旨在确定影响消费者购买电动汽车动机的重要因素。据作者所知，这是第一次将技术接受和使用的统一理论与性能预期、努力预期、燃油效率、技术狂热和广告建模，以最大限度地提高消费者采用电动汽车的动机。智能偏最小二乘法通过绘制概念框架分析了自变量在本研究中的影响。这些数据是通过在线问卷从马来西亚境内的150名受访者那里收集的。研究结果表明，除了努力预期之外的所有因素对增强消费者的积极性都是最重要的。此外，这项研究表明，决定动机和广告的因素与消费者对电动汽车的意图相关，并提供了管理启示。这些因素将为运输部门在连接电动汽车的需求和供应方面提供见解。

**关键词：**电动汽车、动机、技术接受和使用的统一理论、购买意愿、可持续性。

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## 1. Introduction

Sustainable Development Goals (SDGs) 2030 have gained significant attention from researchers and policy-makers to provide multiple benefits for the environment, health, and economy, particularly the urban areas, which will have more than 2/3 of the population in 2050 [1]. UN Secretary-General, in 2019, called all the sectors to accelerate ecological actions to meet the global challenges of reducing emissions in climate change, poverty, and inequality [2]. Many countries worldwide experience these multiple challenges overpopulation, climate change, lack of inadequate infrastructure and resources, extreme weather, related illness, air pollution, and loss of productivity [3, 4]. Promoting the SDGs for addressing environmental health intrusions, such as Climate Change (Goal 13) of reducing carbon emissions, which should be enhanced for well-being and good health worldwide, depends on transport infrastructure [4]. It is an urban or rural area, and the transport sector contributes a lot towards life quality improvement [5]. Due to the adverse global situation, the primary concern is to reduce the ratio of GHG emissions and promote SDGs to address the environmental health intrusions, such as Climate Change (Goal 13) should be enhanced for the well-being and good health (Goal 3) [6]. Well-planned sustainable transport, renewable energy, land use, and waste management can improve the quality of the environment, life, and health [3].

Worldwide, nations' development is dependent on transport infrastructure effectiveness. Efficient transport infrastructure is required for the well-being of cities and inhabitants to have a good source of income. A well-organized transport system effectively improves the environment and economic development [5], consumer shift toward sustainable transport is required. Energy consumed by the transport sector creates a dependency totally on petroleum fuels [5]. Usage of the Internal Combustion Engine (ICEs) vehicles leads to the emission of several gases, and worldwide authorities are more concerned about discouraging the use of ICE vehicles by implementing strict policies; consumer intention needs to shift towards eco-friendly behavior. Globally, authorities are more concerned with moving consumers towards sustainable transport [7] to maximize EV purchases. It can be possible by adopting marketing strategies and motivating consumers toward low emission innovative transport, i.e., Electric Vehicles (EVs), Hybrid Electric Vehicles (HEVs), Plug-in Hybrid Electric Vehicles (PHEVs), Battery Electric Vehicles (BEVs), and Fuel-cell Vehicle (FCVs) as the primary source of sustainable transport.

Malaysia is the 25th most significant greenhouse gas (GHGs) emitter worldwide, and the transport sector

is the 2nd most crucial contributor to carbon emission in Malaysia [8]. Malaysia has the 3rd largest ICE vehicle ownership globally with a 93% percentage [9]. The consistent urbanization, economic growth, and rising incomes have led to a rapid upsurge in vehicle ownership, air pollution, and environmental hazards from GHG emissions are the primary concerns [10]. Malaysia has also announced to cut GHG emissions by 2030 in Greentech Master Plan [11], and the second leading cause of carbon emission is transport in Malaysia. The mere introduction of sustainable vehicles is not sufficient until consumer acceptance and support are adopted.

Acceptance of innovative technologies in developing countries like Malaysia needs financial and educational support and consumer acceptance [12-14]. If the consumers do not intend to purchase EVs, the production alone is not sufficient. EVs have a meager market share, despite having environmental benefits. There are still significant challenges in the smooth uptake of EVs inside Malaysia. However, the purchase of EVs can be uplifted by the possible support from the consumer supply and demand sides. EVs automakers should introduce efficient selling strategies to motivate and enhance consumer intentions to maximize the sale of EVs. Financing the EVs production requires high capital costs, which can influence its end prices; government should support local experts to initiate their technology which can introduce subsidies to make the product more affordable [8].

Furthermore, consumer awareness and motivation about EVs can be further effective in creating demand [15]. Without knowing the consumer demands, the EV market will have unclear directions. EVs supply in the Malaysian market is already available. However, demand for sales of EVs is not adequate. So, this research aims to identify the factors which can enhance consumer intention toward EVs sale. Maximum adoption of EVs can be helpful for the Malaysian government to have a carbon-free environment and attain SDGs of climate change.

UTAUT has been actively used to describe the consumer adoption of new technology. However, challenges are faced by innovative technologies developers to encourage the consumers toward the product and improve the product's future market share [16]. Researchers have used different models to explain motivation, like the consumer choice model, time-series model [17], cohort estimation model for vehicle survival [18], and UTAUT [15]. According to Sang and Bekhet [19], social, environmental, financial, performance, demographic, infrastructure readiness, and government intrusion are more inspired to enhance consumer purchase behavior. An actual purchase of

EVs in Malaysia is meager than consumers' stated preference [20]. Li et al. [21] labeled the factors that affect the purchase intentions of electric vehicles and flexible fuel vehicles by using the Probit model. Diffusion of EV market forecasting models proposed by different researchers [22]. Various studies have used other theories and models to explain EV. However, rare studies look into the factors which can influence consumer intentions to purchase EVs. This study specifically looks into the factors which can motivate and enhance consumer awareness towards the EVs features. This research will analyze the UTAUT extension with an advertisement, fuel efficiency, and technophilia to determine consumer motivation toward EVs. Several factors which can influence consumer behavior towards the products are discussed below.

## 2. Unified Theory of Acceptance and Use of Technology

Venkatesh et al. [23] analyzed related works. First, they conducted an empirical investigation. They combined several parts of the eight behavioral intention models utilized in prior technology acceptance scenarios to search for a complete IT acceptance model. This UTAUT model has approximately 70% variance toward the intention. Eight models identified and examined by these researchers were the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), combined TAM and TPB, Model of PC Utilization (MPCU), Motivation Model (MM), Social Cognitive Theory (SCT), and Innovation Diffusion Theory (IDT). These models and theories have been widely and successfully applied by many studies related to technology adoption, technology dissemination, or innovation diffusion in a broad range of disciplines such as marketing, management, psychology, and information system. As a result, the researchers used the UTAUT model to unite the various views about how people accept technology.

This theory plays a significant role in defining the diffusion of innovative vehicles among society members.

The UTAUT model provides a theoretical framework for investigating the customer acceptability of innovative technology-based systems or services. The model elucidates customers' adoption intents through four components: performance expectations, effort expectations, social influence, and enabling factors [23]. However, numerous research demonstrates that not all aspects of the UTAUT model are essential to understanding customer acceptance of new technologies or services. For instance, considerable research has shown that only performance and effort expectancy factors are significant predictors of customers' intentions to adopt new technology- or mobile-based systems or services [24, 25]. Thus, this study examines two constructs from the UTAUT

model: performance expectancy and effort expectancy, to explain consumer motivations toward sustainable vehicles.

Factors that can enhance consumer behavior have been discussed in different aspects. Like constructs used in the literature are effort expectancy, performance expectancy, government incentives, social influence, environmental concern, perceived enjoyment, innovative technology, and fuel efficiency. This study discusses encouraging factors that appear to be significant to enhance consumer behavior. In his research, T. L. Childers [26] identified the intrinsic motivational factors (customization, advancement, and perceived enjoyment), improving consumer behavioral intention. However, other constructs mentioned above have not been used in the sense of motivational factors. This study will analyze the factors which can influence consumer motivation and awareness of the EVs knowledge.

Based on an exploratory study, five motivational factors to enhance consumer adoption intention have been employed to pursue EVs: performance expectancy, effort expectancy, fuel efficiency, technophilia, and advertisement.

### 2.1. Performance Expectancy (PE)

Performance expectancy is well-defined as “the degree to which individuals anticipate that using this specific system will benefit them in operating advanced technology in volunteer scenarios” [23, 27]. PE construct has been propelled out by perceived usefulness explained in TRA and TAM. PE refers to the students' attitudes toward using mobile learning to improve their academic performance. Venkatesh et al. [23] explored that PE is a more potent driver of users' behavioral intention in using technology. While in current technology, this vehicle's buying behavior, or the quantity to which it has been decided that buying an EV will bring about better performance than traditional automobiles [93]. Venkatesh et al. [23] found out that PE is the most powerful determinant of a user's BI to undertake a technology. PE also played a significant role in influencing client attitudes toward cloud adoption in Pakistan [28]. PE has been proven to substantially affect the acquisition of modern technology goods within the literature. PE extensively influences purchasing of modern technology [28, 29]. Tran, et al. [29] PE appears to have a beneficial impact on consumer intentions in China regarding electric car sharing. Thus, this study proposed hypothesis:

*Hypothesis 1:* Performance expectancy will positively affect consumer purchase intention toward EVs.

### 2.2. Effort Expectancy (PE)

EE is a significant predictor of technology acceptance that is introduced in UTAUT. A perceived level of comfort and ease connected with using new

technology is referred to as EE. The literature indicates EE's usefulness in forecasting consumer intentions toward new technology [29-31]. Madigan et al. [30] confirmed that EE has a significant impact on consumer adoption of modern road transportation systems in European areas. EE favorably influences consumer adoption intentions of cloud technology among Pakistanis [28]. Consumer intention to utilize and actual use of a specific technology are both positively influenced by EE [32]. EE refers to a consumer's perception of how easy it is to use sustainable electric vehicles in this study. EVs being modern technology, will have no hassles and will be simple to operate. As a result, if consumers expect EVs to perform efficiently, they will be more inclined to acknowledge and adopt them. Therefore, consumer motivation to buy electric vehicles is likely to improve due to EE. According to existing literature, Šumak et al. [33], Khalilzadeh et al. [34], behavioral intention is directly influenced by both factors PE and EE. As a result, the following hypothesis is put forth:

*Hypothesis 2:* Effort expectancy will positively affect consumer purchase intention toward EVs.

### 2.3. Fuel Efficiency (FE)

The purchase price of EVs is an essential factor in consumer acceptance. Electric vehicles are considered fuel-efficient and lower fuel costs in the long run compared to conventional combustion engine vehicles [19]. Lower fuel cost advantage can be an efficient tool for consumer motivation, as humans by nature look for the thing which gives efficiency and reduces cost. Fuel efficiency advantage can be a promotional technique to enhance and motivate consumers toward EVs [35]. The fuel efficiency and meager maintenance cost of EVs can be effective in improving consumer behavior. With the help of advertisement and awareness, consumer motivation levels can support purchasing sustainable vehicles. Different studies showed that ICE users could save the higher fuel and gasoline cost by adopting these low fuel cost EVs in the long run [22]. This study proposed the following hypothesis:

*Hypothesis 3:* Fuel efficiency will positively affect consumer purchase intention toward EVs.

### 2.4. Technophilia (TEC)

Technophilia is related to consumer interest, openness, and fascination with technology. According to Rogers [36], consumers are keen to adopt technophiles about innovative technology development at an initial stage when the product is not widely available in the market. Barrientos-Gutierrez et al. [37] viewed new technology products as a desire to find out something innovative and different. Being tech-savvy and skeptical about innovative products encourages consumer purchase intention [38]. At the same time, EVs drivers share their experiences with others about new technology. A consumer seeking innovative

technology is influenced by new products [39]. The efficient performance of the product is a core factor in the acceptance of innovative technology.

*Hypothesis 4:* Technophilia will positively affect consumer purchase intention toward EVs.

### 2.5. Advertisement (ADV)

Advertising helps the company know the products to the public, which is possible with social media's help [40]. Misconception and poor awareness regarding EVs have led the consumer concept of innovative technology out of sight [41]. Consumer awareness and knowledge about EVs are limited, and social media can enhance consumer purchase behavior. In the modern world, consumers are more concerned about using different platforms of social media like Whatsapp, Facebook, Youtube, Twitter, Google+, etc. [42, 43]. Mentioned that social media platforms enhance humans and organizations to signify a new place educationally, socially, commercially, and politically to exchange information and interact about the products [44]. The diffusion of advertisements about EVs on these platforms can enhance consumer awareness and encourage them to purchase these vehicles. Social media can change the behavior and nature of humans towards products, society, or organizations. Social media enhances marketing activities and makes an active platform worldwide for advertisement. The adoption level of EVs is shallow, and the main reason is that consumers are mostly unaware of the EVs and their specifications. An advertisement can be considered responsible for shifting consumer preferences and values towards products.

*Hypothesis 5:* Advertisement will positively affect consumer purchase intention towards EVs.

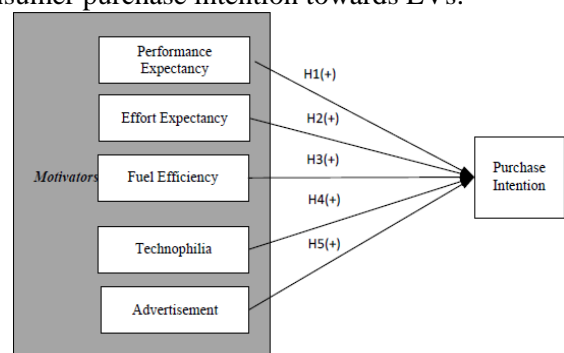


Fig. 1 Conceptual framework

The framework shown in fig. 1 describes the independent and dependent variable and their relationship based on discussed literature review. This framework has five factors to explore: performance expectancy, effort expectancy, fuel efficiency, technophilia, and advertisement towards purchase intention.

## 3. Methodology

An online survey was carried out of 150 respondents over five weeks from Sep to Oct 2020 to

evaluate the influence of motivational factors on consumer purchase intention. In addition, a questionnaire explaining this research purpose was e-mailed to the respondents. Out of 600 desired respondents contacted, only 150 valid responses were received with a 25% response rate. The distribution of online questionnaires was selected based on high-income groups in Malaysia. Identified income-based groups in Malaysia are B40, M40, and T20 (where M stands for Medium and is categorized into 4 groups M1, M2, M3, M4, and T for Top that consist of 2 groups, T1 and T2) [45]. The set research criteria were respondents residing and having an income (M4, T1, and T2) in Malaysia, where details of respondents are mentioned in Table 1. The reason for selecting high-income respondents was that these vehicles' cost is higher than ICE vehicles and to know why they do not plan to buy EVs although they have a good income. One type of non-probability sampling technique i.e., purposive sampling, was used in this study, including the respondent's research judgment to meet research objectives and considered the most relevant research [46, 47].

#### 4. Results and Discussion

The descriptive data were analyzed using SmartPLS 3.2 to evaluate the data normality and discovered that all variables were normally distributed. Further analysis revealed that the relationship between purchase intention and independent variables was significant and positive except for one.

Table 1 Demographic profiles (Authors' estimations)

Demographic characteristics	Frequency	Percentage
Male	81	54%
Female	69	46%
<b>Age</b>		
18-29	14	9.3%
30-39	49	32.6%
40-49	49	32.6%
50-59	28	18.6%
60 years and above	10	6.6%
<b>Race</b>		
Malay	85	56.6%
Chinese	15	10%
Indian	15	10%
Others	35	23.3%
<b>Income</b>		
RM 5000 or below	35	23.3%
RM 5001 - RM 10000	53	35.3%
RM10001 - RM15000	31	20.6%
RM15001 - RM20000	9	6%
RM20001 - RM25000	12	8%
RM 25001 above	9	6%

This study used 8 items of performance expectancy with 0.898 Cronbach Alpha and 6 scale items with 0.819 Cronbach Alpha of effort expectancy, which was identified by Venkatesh et al. [23]. The fuel efficiency has been measured using 7 items scale adopted from Balagopal G. Menon, Biswajit Mahanty [47]. Cronbach

Alpha showed an excellent level of validity and reliability based on testing performed, i.e.,  $\alpha = 0.910$ . Technophilia has been measured using 9 items scale adopted from Seebauer et al. [48]. The Cronbach Alpha reliability of the technophilia is  $\alpha = 0.854$ . Advertisement has been measured by 4 items scale by Katawetawaraks and Wang [49]. The Cronbach Alpha for the reliability of advertisement is  $\alpha = 0.919$ . Moreover, purchase intention has been measured on 5 items scale by Ajzen and Fishbein [50, 51]. Cronbach Alpha for the reliability of purchase intention is  $\alpha = 0.886$ . The average variance extracted (AVE) of constructs was higher than the crucial value of 0.50 [52]. Results of reliability and validity are mentioned in Table 2.

Table 2 Reliability and validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
ADV	0.919	0.922	0.943	0.805
EE	0.819	0.816	0.874	0.584
FE	0.910	0.923	0.930	0.657
PE	0.898	0.902	0.925	0.713
PI	0.872	0.886	0.906	0.660
ADV	0.854	0.872	0.894	0.629

Notes: ADV - advertisement, EE - effort expectancy, PE - performance expectancy, FE - fuel efficiency, PI - purchase intention, TEC - technophilia

Moreover, the Heterotrait-Monotrait Ratio (HTMT) was utilized to evaluate the discriminant validity. Table 3 shows overall results satisfying the validity and reliability requirements in establishing the model.

HTMT ratio of correlations was calculated as a new tool for analyzing constructs' discriminant validity [53]. The value of HTMT greater than .85 shows a problem in discriminant validity [52]. Furthermore, all values in this study are less than the threshold level of 0.85, indicating no discriminant validity issue.

#### 4.1. Hypothesis Testing

To test the hypothesis, the Smart-PLS 3 performed a more advanced analysis. Hair Jr et al. [52] stated that hypothesis testing includes acceptance or rejection criteria based on beta's R2 value and t-value using bootstrapping with a 4,999 resample [53]. Furthermore, the effect magnitude ( $f^2$ ) and predictive relevance ( $Q^2$ ) must be indicated.

Multiple regression has been used to examine the influence of the independent variables in the meantime, Effort expectancy (EE), Performance expectancy (PE), Fuel efficiency (FE), Technophilia (TEC), and findings demonstrated that the independent variables.

##### 4.1.1. Advertisement (ADV) on Purchase Intention (PI)

The overall R2 value is .64, which means 64% of the cases predict the dependent variable, and the Q2 value is .403, which means 40% predictive relevance mentioned in Fig. 2.

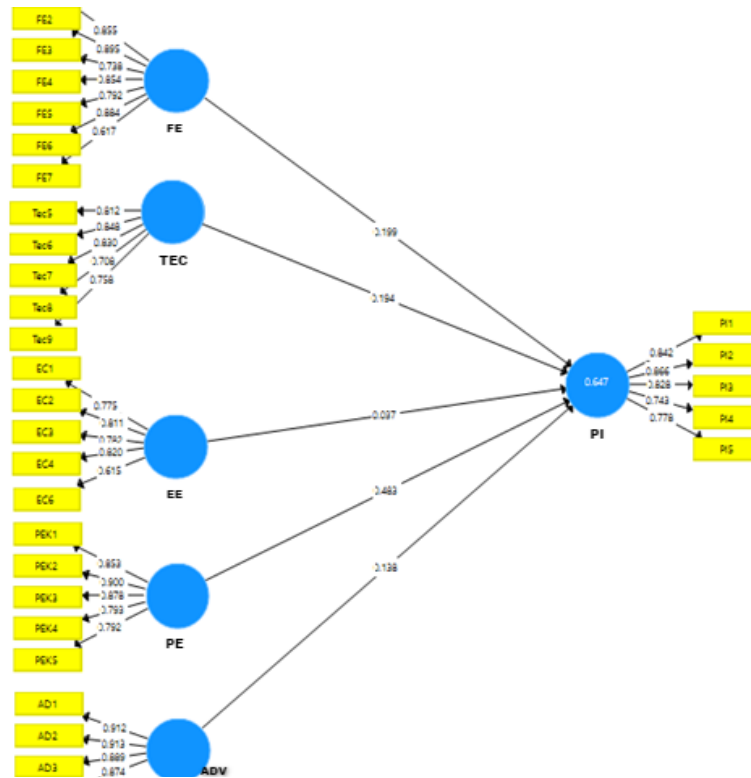


Fig. 2 Structural model

These results have proposed a model of 64.7% of explanatory power for purchase intention with  $R^2 = 0.647$ . Moreover, it is found that the relationship between TEC, FE, PE, and ADV and purchase

intention is positive and significant. However, the relationship between EE and PI is negative and found insignificant. A summarized overview of the findings is mentioned in Table 4.

Table 4 Mean, STDEV, T-values, P-values

	Original Sample (O)	Sample Mean (M)	Std Deviation (STDEV)	T-Statistics ( O/STDEV )	P-Values	Hypotheses
AD ->PI	0.138	0.143	0.058	2.390	0.017	Supported
EE -> PI	0.037	0.035	0.072	0.511	0.609	Not Supported
FE -> PI	0.199	0.202	0.099	2.017	0.044	Supported
PE -> PI	0.483	0.474	0.064	7.521	0.000	Supported
TEC -> PI	0.194	0.201	0.083	2.341	0.019	Supported

## 5. Discussion

The direct influence of performance expectancy on PI was revealed to be significantly positive ( $T = 7.521$ ,  $p = .000$ ), and  $H_5$  is accepted. Performance expectancy affects consumer decision-making significantly based on information he possesses; it is a significant factor in enhancing consumer intention. The empirical results between effort expectancy and purchase intention revealed a negative relationship towards Evs ( $T = .511$ ,  $p = .609$ ); based on the results,  $H_3$  is not accepted. The factor loading of item EE5 was low and removed, but the effort expectancy significance level has not improved and remained statistically negative. However, effort expectancy in literature has been a significant and positive effect on environmental product purchase and is a strong predictor of improving consumer purchase intentions [54]. The direct effect of fuel efficiency and purchase intention showed significant ( $T = 2.017$ ,  $p = .044$ ), and based on the results,  $H_1$  is

accepted. Fuel efficiency as an EVs motivational factor can enhance consumer purchase intention. Fuel efficiency has been used first time in the EVs context and found significant in enhancing consumer intentions. Advertisement's direct effect on purchase intention showed positive significance ( $T = 2.390$ ,  $p = .017$ ), and based on results,  $H_5$  is accepted. The awareness level of the consumer about the specific product can be improved with the help of advertisements; it can be a significant factor in enhancing consumer motivation. The suggested relationship between technophilia and purchase intention was examined as positive. Technophilia as a motivator has revealed a statistically significant relationship with purchase intentions ( $T = 2.341$ ,  $p = .019$ ); based on the results,  $H_2$  was supported. Factor loadings of the first 4 items, TEC1, TEC2, TEC3, and TEC4, were less than 0.5; that is why items were removed and analyzed again. Innovative technology as

an aspect of internet connectivity, home charging facilities, and quick chargers could significantly influence consumers [55].

Based on analyzed data and results, there is a positive relationship among variables except for EE. This study also proved that motivational factors could affect consumer purchase intention toward EVs. It supports that consumer awareness and knowledge can be boosted with fuel efficiency, technophilia [56], performance expectancy, and advertisement. Advertisement can effectively enhance consumer awareness and knowledge about EVs' features. The fuel efficiency of EVs supposedly helps the consumer to accept them instead of ICE vehicles. Previous studies reveal that a particular product is related to finding mutual understanding through messages available by advertisement. The information delivered to consumers via advertising also needs to show qualitative features, such as precision, timeliness, and efficacy, significantly affecting consumer purchase intention towards specific products. According to Jan et al. [56], most respondents feel that advertising helps people live in a modern world, enhancing their awareness and intention. Consumer knowledge about the environment makes them more confident about the sustainability and purchase of EVs to reduce transport emissions.

Meanwhile, the lowest mean score is on the EE\*PI through path coefficient,  $p = .609$ . Based on the obtained results, the effort expectancy aspect of the EVs has not shown significant results. However, the EE has been considered an influential factor to enhance consumer purchase intentions. The survey has observed that consumer awareness of the electric vehicle prospects is limited; that is why the knowledge and sale of these vehicles are low. This research suggests the solution to enhance consumer motivation toward electric vehicles by using UTAUT.

## 6. Conclusion

Based on the study model, five routes have been linked in this research related to EV adoption, including fuel efficiency, technophilia, effort expectancy, performance expectancy, and advertisement. Effort expectancy and performance expectancy factors are related to the UTAUT model, where this model has been used to reduce transport carbon emissions significantly. Overall, the findings of this research are promising to emphasize and influence consumer motivation toward EVs. Results analyzed that all independent variables except effort expectancy efficiently enhance consumer motivation. Measuring the sustainability dimensions in the context of motivation makes it more relevant in the prevailing scenario. Other factors like advertisement and marketing strategies guide are aware of and motivate consumers toward EV sustainability.

Many neglected factors related to EVs have been explored among UTAUT by adding fuel efficiency,

technophilia, and advertisement in this study to examine the acceptance of EVs in Malaysia. However, studies are insufficient for research related to consumer motivation toward the purchase of EVs. This research space in by analyzing the consumer EVs motivation. To the best of the author's knowledge, this contribution is the initial step where the unified theory of acceptance and use of technology (UTAUT) was modeled with performance expectancy, effort expectancy, fuel efficiency, technophilia, and advertisement to maximize the consumer motivation towards adoption of EVs. This study aims to identify the significant factors that can influence consumer motivation toward purchasing EVs.

The study's outcome is striking motivational factors, which significantly influence consumer adoption of EVs and possibly establish a potential benefit for the automakers and the environment. The possible influence of an awareness campaign will improve consumer motivation and interest in EV adoption. Specifically, this research contributed by considering the advertisement toward the acceptance of EVs in the automotive context. The study's findings also revealed that higher advertisement campaigns would be more likely to enhance consumer motivations toward EVs.

Although EVs are available in the Malaysian market, the demand for EVs is deficient. The main reason is consumer unawareness and limited knowledge about EVs, which the industries can counter with effective marketing strategies. Therefore, the government should be introduced to empower EV sales.

The acceptance of EVs is helpful to reduce transport carbon emissions and attain the sustainable development Goal of Climate Change. Therefore, the companies should sponsor and advertise EVs to motivate consumers to boost their sustainable purchase behavior, leading to the Sustainable Development Goal and Green Technology Master Plan 2030 of reducing transport carbon emissions. The motivating factors suggested in this study will effectively enhance consumer adoption intention behavior towards EVs. With the help of awareness and advertisement, the motivation level of the consumer will be encouraged to develop purchase behavior towards EVs.

### 6.1. Limitations and Future Research

This study acknowledges some limitations, which can drive future researchers. This study includes the two constructs from UTUAT performance expectancy and effort expectancy in this research. Although in predicting consumer intentions, these two constructs tend to be most critical towards adopting new technology [57], future studies can consider all constructs of UTAUT to investigate consumer purchase intention towards EVs.

Future research could implement these studies into the large data size to get better results, as this study

data was limited to 150 respondents and cannot be generalizable in the whole context, and ruled out its analysis with structural equation modeling. There is still room for further studies with a mixed-method approach to analyze the significant factors that can influence consumer motivation. The EV emotional factor to overcoming barriers can also be studied in the future. The key finding of this paper was that consumer motivation, awareness, and knowledge of EVs is shallow that should be extended across the country (Malaysia).

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