International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

Analysis of Electric Vehicle Purchase Intentions in Indonesia Using the Extension C-TAM-TPB Model

Indira Rachmawati[1], Rafi Amani Muflih Rahardi[2]
[1,2] School of Economics and Business, Telkom University, Indonesia

ABSTRACT: The success of electric vehicles is influenced by how they are accepted and adopted by society. Identifying driving factors can help stakeholders take appropriate steps to drive Electric Vehicle Purchase Intentions. This study examined the driving variables of EV Purchase Intention using the C-TAM-TPB model approach and six extension variables in an emerging market context. This research is quantitative research. Data were collected from a questionnaire distributed to 385 people using a purposive sampling technique. PLS is used in the data analysis technique. Based on the research results, Perceived Usefulness and Perceived Ease of Use significantly and positively affects Attitudes Toward EV. Furthermore, Attitude Toward EVs, Price Value, and Cognitive Status significantly and positively affect EV Purchase Intention. Meanwhile, the Infrastructure Barrier significantly and negatively affect EV Purchase Intention. Meanwhile, Incentive Policy Perception, Functional Value, and Perceived Risk have no significant effect on EV Purchase Intention.

KEYWORDS: C-TAM-TPB, Indonesia, Infrastructure Barrier, Electric Vehicle, Purchase Intention, Transportation.

INTRODUCTION

High transport activity and the use of fossil fuels make the transport sector one of the biggest contributors to global greenhouse gas emissions (Singh et al., 2023). Concerns about environmental damage have led to increased public awareness about the importance of environmental conservation (Zaremohzzabieh, et al., 2021). In reducing the impact of greenhouse gases and air pollution, it is critical to reduce the use of fossil energy to move toward a low-carbon transportation system, one of which is electric vehicles (Tarei et al., 2021).

Electric vehicles are considered one of the responses to reduce oil energy use and carbon emissions from the transportation sector (Safarian, 2023). Replacing combustion vehicles with electric vehicles can potentially solve various transportation sector problems, including reducing air pollution and dependence on petroleum (Miranda & Delgado, 2020).

The Indonesian government encourages electrification by issuing various regulations and policies to support the use of electric vehicles (Rahardi & Rachmawati, 2023). That will provide opportunities for automotive manufacturers to produce and sell their electric vehicle in Indonesia (Tu & Yang, 2019). However, the number of electric vehicles in Indonesia is still limited. Based on sales data in Indonesia, the number of electric cars sold in Indonesia in 2022 was 15,437 units, far behind the overall number in 2022 of 1,013,582. Total EVs sold in 2022 amounted to only 1.52% of overall car sales (GAIKINDO, 2023). Compared to the EV market share in Southeast Asia, Indonesia is the second largest in Southeast Asia, with a market share of 25.20%, which is still below Thailand as the first EV market share in ASEAN, with a market share of 59.20% (Yasyi, 2022).

Most people are enthusiastic about EVs and would like to own one , but their interest in adopting EVs is currently relatively low (She et al., 2017). Limited range, high purchase price, and long charging duration are challenges. The large number of people who do not know about EVs is also a problem of the low penetration of EVs in society (Dwipayana et al., 2023). In developing countries, the level of EV usage is still minimal. Stronger knowledge, awareness, and attitude change on EV transportation are needed (Krishnan & Koshy, 2021).

Given the low adoption of EVs, it is essential to analyse the factors affecting EV Purchase Intention (Vafaei-Zadeh et al., 2022). These influential factors describe the ideal conditions of the users (Utami et al., 2020). It is important to know the factors that encourage and also hinder consumers from buying or using a product, because consumers make the final decision to buy a particular product (Indrawati & Haryoto, 2015). It aims to formulate prioritized policies and strategies to help manufacturers, governments, and other stakeholders formulate policies and measures to accelerate EV adoption (Utami et al., 2020).

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

LITERATURE REVIEW

The majority of studies conducted on electric vehicles in developed countries, such as China (Huang & Ge, 2019; X. W. Wang et al., 2021), Portugal (Miranda & Delgado, 2020), Australia (Loengbudnark et al., 2022), Greece (Mpoi et al., 2023), or the Netherlands (Noppers et al., 2019). A few studies have been conducted on EV Purchase Intention in developing countries, especially Indonesia. Indonesia is a developing country with many differences compared to other developed countries, such as geographical differences, infrastructure, differences in EV products sold, differences in regulations, and differences in consumer behavior. These differences can allow for differences in EV Purchase Intention between Indonesia and other countries.

In determining the factors influencing EV Purchase Intention, Vafaei-Zadeh et al. (2022) adopted the C-TAM-TPB model developed by Taylor & Todd in 1995. The study was conducted by considering the level of technology adoption by the public in the TAM model and the two components of Subjective Norms and Perceived Behavioral Control to measure users' behavioral intentions comprehensively. Despite the fact that TAM is explaining how innovation has been accepted in society, there is still a lack of explanation for consumers' behavior. On the other hand, the impact of behavioral intentions on three factors has been investigated using TPB, i.e., Perceived Behavioral Control, Subjective Norms, and Attitude (Ajzen, 1991). Vafaei-Zadeh et al. (2022) built a model to determine the factors affecting EV Purchase Intention using the C-TAM-TPB model.

The Technology Acceptance Model (TAM) is widely used to determine the adaptation to the use of new technology (Zhang et al., 2020). TAM is one of the technology or system adoption models. It has been proven that this model can be used to explain the analysis of consumer acceptance and use of innovative technologies (Gandajati & Mahyuni, 2022). However, this model has the disadvantage of not having social factors and social control. These two variables are sufficient to explain the influence of the components of technology used by consumers, so the TPB model is combined to fulfill the shortcomings of these two factors (Taylor & Todd, 1995).

In order to enhance the perspective on countries with developing EV markets, this research is also adding additional variables. This study also expands the framework with several variables consumers consider before buying an electric vehicle. These additional variables consist of Incentive Policy Perception (X. W. Wang et al., 2021), Price Value (Vafaei-Zadeh et al., 2022), Functional Value (Febransyah, 2021), Cognitive Status (Huang & Ge, 2019), Infrastructure Barrier (Tarei et al., 2021; Vafaei-Zadeh et al., 2022), and Perceived Risk (Hu et al., 2023; Vafaei-Zadeh et al., 2022).

In their study, Vafaei-Zadeh et al. (2022) suggested Perceived Usefulness as a measure of people's belief that EV could improve quality of life, particularly in terms of the environment. This relates to the consumption of green products that have more significant environmental benefits when compared to conventional products. Chen and Lu (2016) argued that Perceived Usefulness is how consumers observe green products will improve users quality of life, thus influencing their consumption intention. Based on this, the first hypothesis is: **H1**. Perceived Usefulness has a significant positive effect on Attitude Toward EV.

Perceived Ease of Use determines how something can be understood or used. Davis (1989) argued that a person tends to use items that are much simpler. In this case, the ease of use that users feel toward electric vehicles. The Perceived Ease of Use is the extent to which persons perceive they do not need any further efforts in learning how to use EV (Krishnan & Koshy, 2021). Users tend to believe electric vehicles are easy to use and easy to learn (Vafaei-Zadeh et al., 2022). Based on this, the second hypothesis is: **H2**. Perceived Ease of Use has a significant positive effect on Attitude Toward EV.

Ajzen (1991) and Taylor and Todd (1995) argued that there was a substantial influence between Attitude and Intention. Attitude is a psychological process that determines an individual's like or dislike of something. Therefore, it is more likely for individuals to take action to buy an electric vehicle if they develop a positive opinion about the purchase of an EV (Vafaei-Zadeh et al., 2022). Based on this, the third hypothesis is: **H3**. Attitude has a significant positive effect on EV Purchase intention.

Subjective Norms refer to social pressure to do or not do an action. Subjective Norms are based on the idea that certain individuals or groups will support and encourage certain behaviors. In other words, someone important to individuals takes action to care for the environment, then it becomes rational for others to follow (Vafaei-Zadeh et al., 2022). Subjective Norms are defined as consumers' beliefs about the fact that somebody who is important to them may have an impact on their EV Purchase Intention (Huang & Ge, 2019). Based on this, the fourth hypothesis is: **H4**. Subjective Norms have a significant positive effect on EV Purchase intention.

Perceived Behavior Control PBC refers to individuals' perceptions of the various limitations that can be encountered in a particular act, such as time constraints, comfort and economic situations; it is based on experience or expectations from previous

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

experiences. PBC in this study refers to the level of difficulty consumers perceive regarding the intention to purchase an electric vehicle (Huang & Ge, 2019). Vafaei-Zadeh et al. (2022) stated a significant positive relationship between Perceived Behavioral Control and EV Purchase Intention. Based on this, the fifth hypothesis is: **H5**. Perceived Behavioral Control has a significant positive effect on EV Purchase intention.

Incentive policies involve the tangible benefits that government provides for consumers, which may stimulate their rational perception. Sierzchula et al. (2014) examined financial incentives policies in 30 countries and found that they are positively correlated with the market share of electric vehicles. Wang et al. (2018) divided perceived government policies into perceived financial incentive policies, perceived information provision policies, and perceived convenience policies. Positive consumer attitudes are further benefits from government incentive policies (Ajzen, 1991; X. W. Wang et al., 2021). Based on this, the sixth hypothesis is: **H6**. Incentive Policy Perception has a significant positive effect on EV Purchase intention.

From the cost management perspectives, price value is based on consumers' utility. Consumers perceive a product or service to be good value when the benefits of an item exceed its cost. Compared to petrol, the running cost of an EV is cheaper and it's more energy effective than a conventional combustion engine. This helps to reduce transport costs and is also cost effective in the long run. The price will reflect a high value when consumers know that using electric vehicles can save money. (Vafaei-Zadeh et al., 2022). Based on this, the seventh hypothesis is: **H7**. Price Value has a significant positive effect on EV Purchase intention.

Functional values can be considered the primary cause of consumer choice. For EVs, functional values represent the functionality, utility, or benefits derived from the functions performed by the EV. Vehicle performance considerations play a vital role in the purchase decision-making process. If EV performance meets their needs, they intend to adopt it (Han et al., 2017). Febransyah (2021) stated that Functional Value is a factor consumers highly consider in purchasing EVs. Based on this, the eighth hypothesis is: **H8**. Functional Value has a significant positive effect on EV Purchase intention.

The purchase intentions and behavior of consumers towards low carbon vehicles will be influenced by the cognitive status of the current environmental, energy, and low carbon vehicle policies. When government policies are well understood by the consumer, it is generally more likely that he will purchase EV. A significant positive relationship was established between cognitive status and the intention to purchase an EV (Huang & Ge, 2019). Widodo and Wahid (2023) define that a moral person will be responsible for the environment, adopt an environmentally friendly lifestyle, buy environmentally friendly products, and consume environmentally friendly products. This is consistent with a study by Shakeel (2022), which concluded that cognitive status has a strong positive influence on the EV Purchase Intention. Based on this, the ninth hypothesis is: **H9**. Cognitive Status has a significant positive effect on EV Purchase intention.

One of the most important variables that can influence EV Purchase Intentions is infrastructure barriers. Without supporting infrastructure, the public's adoption intention to use electric vehicles is relatively low. Previous studies have shown that the availability of support facilities can have a direct impact on the competitiveness of EV (Vafaei-Zadeh et al., 2022). Biresselioglu et al. (2018) have pointed out that the most important barrier to public adoption of EV is lack of infrastructure for this energy source. Giansoldati et al. (2020) argued that the absence of charging facilities is the most significant barrier to EV adoption. Based on this, the tenth hypothesis is: **H10**. Infrastructure Barrier has a significant negative effect on EV Purchase intention.

A number of studies have suggested that perceived risk is a factor preventing consumers from using new technologies or services (Vafaei-Zadeh et al., 2022). Perceived Risk can be classified into six aspects: functional, financial, social, psychological, and time-based risk (Li et al., 2017). Perceived Risk often influences decisions concerning changing, delaying, or canceling purchase orders. Electric vehicles are a new technology, and consumers feel worried about the safety and security of these electric vehicles due to their perception that the technology used by electric vehicles is immature (Hu et al., 2023). Individuals tend to decrease their purchasing intentions as they feel a greater amount of risk (Vafaei-Zadeh et al., 2022). Based on this, the eleventh hypothesis is: **H11**. Perceived Risk has a significant positive effect on EV Purchase intention.

Based on the background, this study aimed to determine EV Purchase Intention in Indonesia using the C-TAM-TPB model developed by Vafaei-Zadeh et al. (2022). Furthermore, six variables were added to the model. These variables are vital to measure the factors that influence EV Purchase Intention. This study obtained information about the EV purchase intention of Indonesian consumers and the key factors that influence the purchase intention. Based on the hypothesis formulated, the framework used is in Figure 1.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

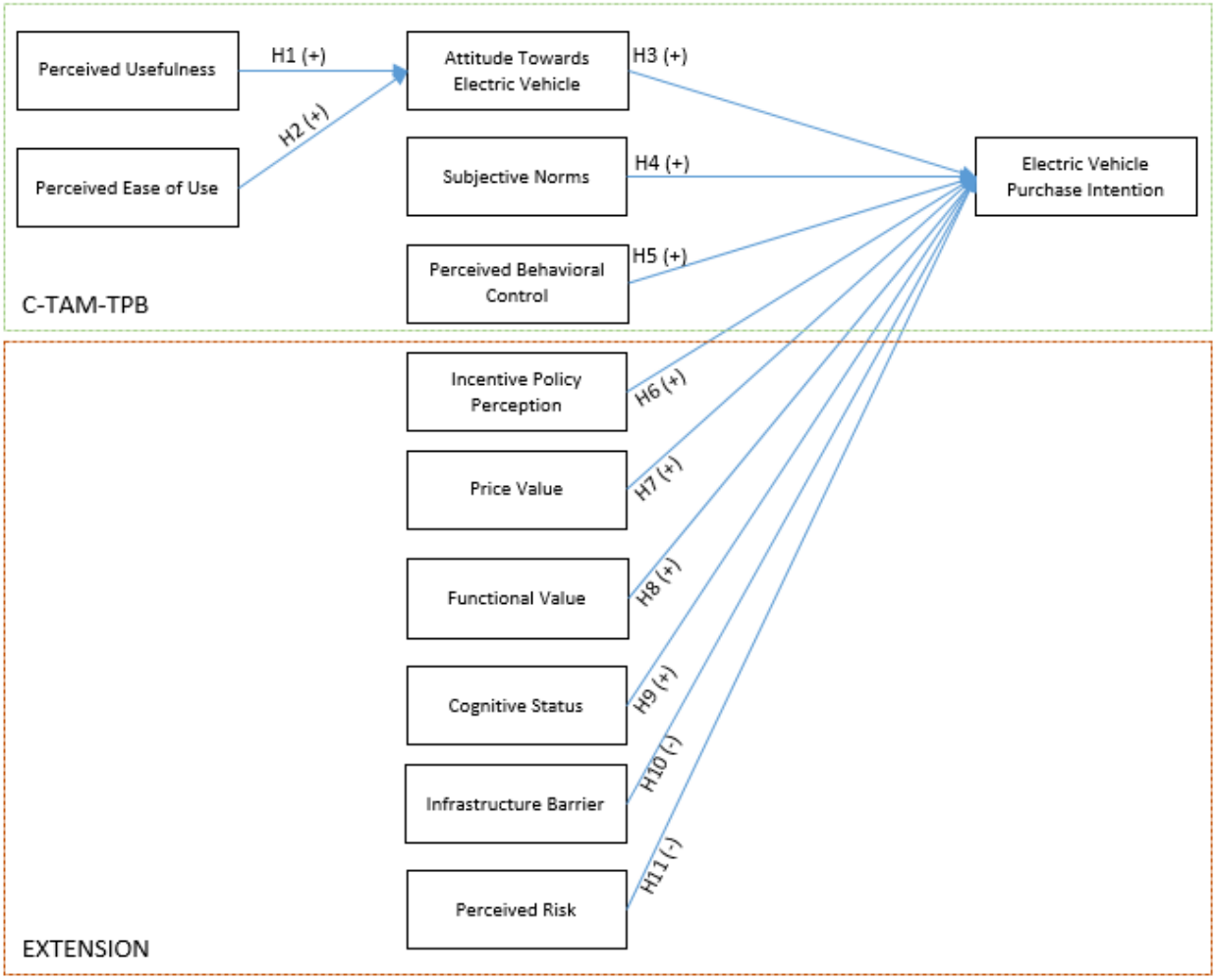

Figure 1. Theoretical Framework

METHODS

The study population was an unknown number of vehicle users. Because the population size is unknown, based on the Bernoulli's equation with an error rate of 5%, the minimum sample size in this study is 385 respondents. This study used quantitative data using the distribution of questionnaires with Google Form. The technique used was nonprobability sampling with purposive judgment sampling. It is a sampling technique with certain considerations, i.e., respondents domiciled in Indonesia, over 17 years old, car users, and know about electric vehicles.

In the first stage, a pretest was conducted using 30 random respondents to check whether there were problems regarding instrument clarity, wording, and completion time. Based on the feedback from the pretest, minor changes were made, such as removing irrelevant items, changing the wording, and correcting survey layout, until publishing the final version of the questionnaire instrument. In the second stage, the instrument was distributed over a 40-day collection period until it met the minimum number of respondents of 385. The survey was voluntary without offering any incentives.

For all variables, this study used a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measurement items of Perceived Ease of Use, Perceived Usefulness, Attitude Toward EV, Perceived Behavioral Control, Price Value, and EV Purchase Intention were adapted from Vafaei-Zadeh et al. (2022). Subjective Norms measurement items were adapted from R. Wang et al. (2021). Measurement items of Incentive Policy Perception were adapted from X. W. Wang et al. (2021). Functional Value measurement items were developed from research Febransyah (2021). Cognitive Status measurement items were developed

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

from Huang and Ge (2019). Infrastructure Barrier measurement items were adapted from Tarei et al. (2021). Perceived Risk measurement items were adapted from Hu et al. (2023).

For the analysis conducted in this study, a partial Least Square (PLS) has been used to analyze the framework and verify the hypothesis. In the case of small sample sizes and complex models, PLS-SEM works effectively. The use of the PLS method provides researchers with a high level of accuracy when estimating parameter values, which is achieved through greater statistical power compared to CB-SEM. Greater statistical power means that PLS-SEM is more likely to make certain relationships significant when they exist in the population (Hair et al., 2021). This study used many complex structures, making PLS suitable for use in this study. This study utilized a two-step approach, i.e., measurement and structural models.

RESULT AND DISCUSSIONS

A. Demographic Profile

The complete demographics are in Table 1. Based on the demographic data, it discovered that most respondents were male (56.6%). Based on age, the majority are 27-36 years old (37.1%). Based on education, the majority have a bachelor's degree (58.7%). Based on occupation, most work as private employees (26%). Based on income, the majority earn Rp8,000,001-16,000,000 (46%). Based on marital status, the majority are married (54%). Based on the number of car owners, most have one car (55.6). Based on the location of residence, the majority reside in the city (76.6%). Furthermore, the respondent data is distributed across 29 provinces, where the majority resides in West Java (31.4%).

Table 1. Respondent Demographic

Variables	Category	Respondent	Percentage (%)
Gender	Male	218	56.6
	Female	167	43.4
Age	17-26 years old	94	24.4
	27-36 years old	143	37.1
	37-46 years old	87	22.6
	47-56 years old	41	10.6
	57-66 years old	17	4.4
	above 66 years old	3	0.8
Educational Background	Junior High Schools	1	0.3
	Senior High School	23	6.0
	Associate Degree	33	8.6
	Bachelor Degree	226	58.7
	Graduate Degree	93	24.2
	Postgraduate Degree	9	2.3
Marital Status	Single	177	46.0
	Married	208	54.0
Numbers of Cars Owned	0	2	0.5
	1	214	55.6
	2	113	29.4
	More than 2	56	14.5
Monthly Income (Rp)	Under Rp 8.000.000	68	17.7
	Rp 8.000.001-16.000.000	177	46.0
	Rp 16.000.001-24.000.000	71	18.4
	Rp 24.000.001-32.000.000	30	7.8

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

Variables	Category	Respondent	Percentage (%)
	Rp 32.000.001-40.000.000	14	3.6
	More than Rp40.000.000	25	6.5

B. Measurement Model

In determining values of convergent validity, discriminant validity and reliability the measurement model has been used. The results of testing the measurement model are presented in Table 2. Testing convergent validity used the outer loading value and the average variance extract (AVE) (Hair et al., 2021). Based on the outer loading value, all indicators used are between 0.713 to 0.890, higher than the value suggested by Hair et al. (2021) of 0.70. Furthermore, based on the AVE value, all variables used are valued between 0.558 and 0.781, higher than the value suggested by Hair et al. (2021) of 0.50. Furthermore, discriminant validity testing was performed using the Fornell-Larcker value found in Table 3. Based on the Fornell-Larcker value, all variables used are between 0.747 to 0.884, higher than the correlation value between other constructs.

Reliability testing uses the value of composite reliability and Cronbach's Alpha in Table 2. Based on the Composite Reliability value, all variables' values range between 0.841 to 0.943, higher than the value suggested by Hair et al., (2021) of 0.70. Based on Cronbach's Alpha value, all variables used are valued between 0.718 to 0.933, higher than the value suggested by Hair et al. (2021) of 0.70.

Table 2. Measurement Model

Variable	Item	Outer Loading	AVE	CR	Cronbach's Alpha
Perceived Usefulness	PU1	0.753	0.558	0.863	0.802
	PU2	0.717			
	PU3	0.754			
	PU4	0.791			
	PU5	0.718			
Perceived Ease of Use	PEOU1	0.813	0.639	0.841	0.718
	PEOU2	0.832			
	PEOU3	0.750			
Attitude Towards EV	ATT1	0.794	0.676	0.862	0.761
	ATT2	0.820			
	ATT3	0.852			
Subjective Norms	SNN1	0.826	0.617	0.865	0.792
	SNN2	0.765			
	SNN3	0.759			
	SNN4	0.790			
Perceived Behavioral Control	PBC1	0.778	0.572	0.870	0.815
	PBC2	0.726			
	PBC3	0.735			
	PBC4	0.777			
	PBC5	0.765			
Incentive Policy Perception	IPP1	0.738	0.598	0.912	0.888
	IPP2	0.730			
	IPP3	0.786			
	IPP4	0.809			
	IPP5	0.788			
	IPP6	0.793			

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

Variable	Item	Outer Loading	AVE	CR	Cronbach's Alpha
	IPP7	0.765			
Price Value	PV1	0.867	0.723	0.887	0.808
	PV2	0.877			
	PV3	0.804			
Functional Value	FV1	0.783	0.610	0.887	0.840
	FV2	0.772			
	FV3	0.785			
	FV4	0.772			
	FV5	0.792			
Cognitive Status	CS1	0.839	0.640	0.876	0.811
	CS2	0.820			
	CS3	0.713			
	CS4	0.823			
Infrastructure Barrier	IBB1	0.882	0.723	0.928	0.906
	IBB2	0.880			
	IBB3	0.878			
	IBB4	0.868			
	IBB5	0.731			
Perceived Risk	PR1	0.766	0.647	0.943	0.933
	PR2	0.821			
	PR3	0.840			
	PR4	0.761			
	PR5	0.811			
	PR6	0.787			
	PR7	0.826			
	PR8	0.827			
	PR9	0.796			
Purchase Intention	PI1	0.889	0.781	0.860	0.860
	PI2	0.872			
	PI3	0.890			

Table 3. Discriminant Validity Fornell-Larcker

Variable	ATT	CS	EVPI	FV	IPP	IBB	PBC	PEOU	PR	PU	PV	SNN
ATT	0.822											
CS	0.715	0.800										
EVPI	0.727	0.723	0.884									
FV	0.724	0.734	0.690	0.781								
IPP	0.567	0.569	0.581	0.578	0.773							
IBB	-0.145	-0.235	-0.260	-0.201	-0.103	0.850						
PBC	0.694	0.676	0.723	0.674	0.629	-0.105	0.756					
PEOU	0.710	0.709	0.751	0.707	0.511	-0.219	0.665	0.799				
PR	-0.289	-0.372	-0.383	-0.345	-0.238	0.616	-0.266	-0.382	0.804			
PU	0.743	0.708	0.746	0.730	0.629	-0.144	0.687	0.756	-0.309	0.747		
PV	0.701	0.674	0.710	0.684	0.582	-0.215	0.607	0.705	-0.350	0.701	0.850	
SNN	0.730	0.732	0.707	0.722	0.643	-0.163	0.649	0.655	-0.298	0.703	0.681	0.785

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

C. Structural Model

According to Matthews et al. (2018), one can see two criteria in evaluating the structural model, i.e., R-Square and the level of significance of the Path Coefficient. R-Square aims to determine the amount of variation in the dependent variable by the independent variable. The R-Square value ranges from 0 to 1. Hair et al. (2021) stated that an R2 value of 0.75 is significant, 0.50 is moderate, and 0.25 is poor.

Based on the research results, the Attitude Toward EV variable has an R-square of 0.604 with an adjusted R-square of 0.602 included in the moderate category. It shows that Perceived Ease of Use and Perceived Usefulness affect Attitude Toward EV variable by 60.2%. Furthermore, the EV Purchase Intention variable has an R-square of 0.704 with an adjusted R-square of 0.697 included in the moderate category. It shows that it Perceived Ease of Use and Perceived Risk affect Attitude Toward EV variable by 60,2%. And furthermore, Attitude Toward EV, Subjective Norms, Perceived Behavioral Control, Price Value, Incentive Policy Perception, Functional Value, Cognitive Status, Infrastructure Barrier, and Perceived Risk affect EV Purchase Intention variable by 69.7%. Next is Effect Size to measure whether the predictor variables affect the structural model. The effect size in this study is presented in Table 4 and Figure 2.

Based on the Goodness of Fit test results, it can be seen that the SRMR value is below 0.08, so the model has a good fit. Apart from that, based on the NFI value of 0.739, it is included in marginal fit because it has a value below 0.90. Furthermore, based on the RMStheta value in Table 4.34, it has a value of 0.110, which shows that the model has good fit because it is close to 0. This shows that the outer model and inner model in this study are relatively strong for prediction.

Path Coefficient analysis analyses previously formulated hypotheses. The results of testing the path coefficient of this study are in Table 4. Based on the test results, it revealed that Perceived Usefulness (H1: $\beta = 0.482$, $p < 0.001$) and Perceived Ease of Use (H2: $\beta = 0.346$, $p < 0.001$) have a significant positive effect on Attitude Toward EV. Next, Attitude Towards EV (H3: $\beta = 0.160$, $p < 0.001$), Subjective Norms (H4: $\beta = 0.124$, $p < 0.001$), Perceived Behavioral Control (H5: $\beta = 0.271$, $p < 0.001$), Price Value (H7 : $\beta = 0.197$, $p < 0.001$), and Cognitive Status (H9: $\beta = 0.141$, $p < 0.001$) have a significant positive effect on EV Purchase Intention. Meanwhile, Infrastructure Barrier (H10: $\beta = 0.482$, $p < 0.001$) has a significant negative effect on EV Purchase Intention. However, the variables Incentive Policy Perception (H6: $\beta = 0.012$, $p > 0.784$), Functional Value (H8: $\beta = 0.025$, $p > 0.644$), and Perceived Risk (H6: $\beta = -0.048$, $p > 0.173$) do not have a significant effect on EV Purchase Intention. Based on the results of the Structural Model analysis (Path Coefficient and T Value) it can be seen that H1, H2, H3, H4, H5, H7, H9, and H10 are accepted, while H6, H8, and H11 are rejected.

Table 4. Hypotesis Testing

Hypotesis	Relationship	Coefficient	Std.Dev	t-value	R2	P-values	Supported
H1	PU -> ATT	0.482	0.063	7.667		0.000	Supported
H2	PEOU -> ATT	0.346	0.061	5.681	0.602	0.000	Supported
H3	ATT -> PI	0.160	0.057	2.777	0.697	0.005	Supported
H4	SN -> PI	0.124	0.062	2.005		0.045	Supported
H5	PBC -> PI	0.271	0.043	6.284		0.000	Supported
H6	IPP -> PI	0.012	0.043	0.274		0.784	N. Supported
H7	PV -> PI	0.197	0.050	3.947		0.000	Supported
H8	FV -> PI	0.025	0.054	0.463		0.644	N. Supported
H9	CS -> PI	0.141	0.055	2.594		0.009	Supported
H10	IBB -> PI	-0.077	0.030	2.599		0.009	Supported
H11	PR -> PI	-0.048	0.035	1.364		0.173	N. Supported

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

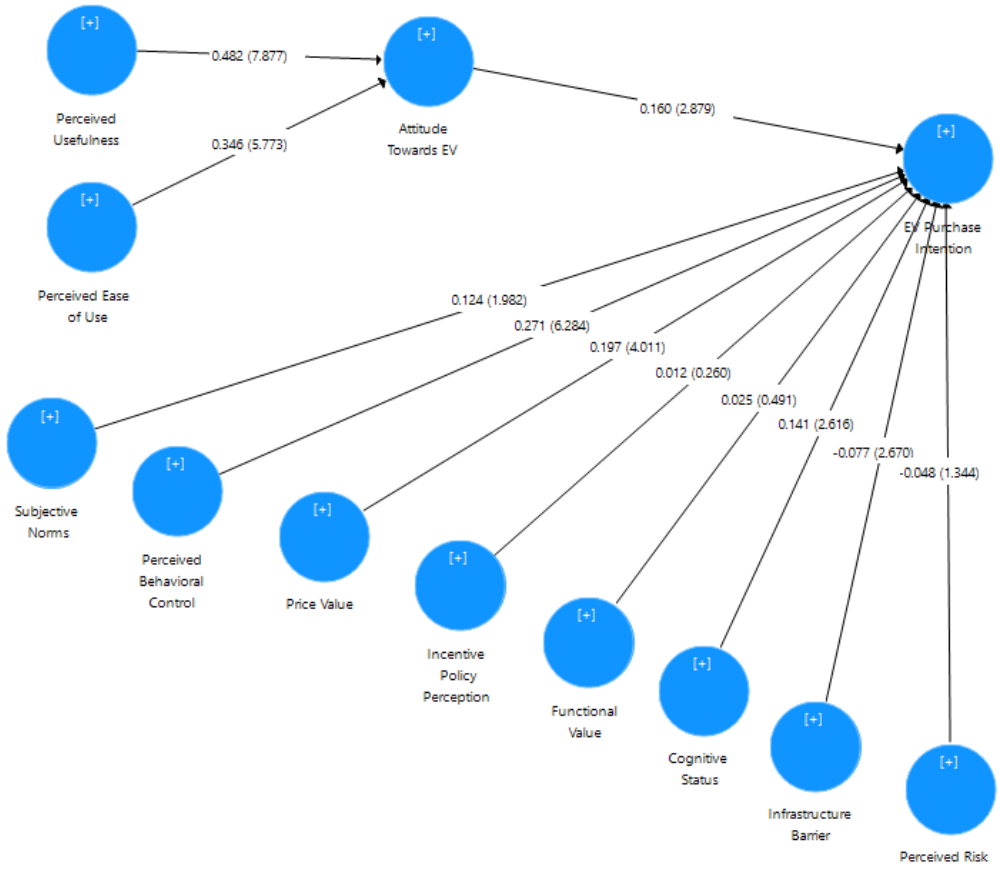

Figure 2. Path Coefficient and t-value

D. Discussion

The transportation sector is the cause of high pollution, especially in metropolitan cities like Jakarta. Based on research results in 2018, the transportation sector is the main source of air pollution consisting of NOx (72.40%), CO (96.36%), PM10 (57.99%), and PM2.5 (67.03%) pollutants (Yuliani, 2021). Concerns about environmental and health damage due to pollution have increased awareness of various parties on the importance of environmental conservation (Zaremohzzabieh et al., 2021). One of them is an electric car, which is one of the responses to reduce oil energy use and carbon emissions from the transportation sector (Cecere et al., 2018; Han et al., 2017; Junquera et al., 2016).

EV sales have been increasing since 2017, but based on statistics, EV sales penetration is only about 1.47 percent of all cars sold in Indonesia annually. It remains low compared to overall car sales (GAIKINDO, 2023). Compared to the EV market share in Southeast Asia, Indonesia is the second largest in Southeast Asia, with a market share of 25.20%, which is still below Thailand as the first EV market share in ASEAN, with a market share of 59.20%. EVs still face the problem of low adoption rate, and the market share of EVs is still relatively small than the conventional vehicles (She et al., 2017).

This study used the C-TAM-TPB model to assess Perceived Ease of Use, Perceived Usefulness, Attitude Toward EV, Perceived Behavioral Control, and Subjective Norms. Moreover, this study added extension variables that consumers consider in buying electric vehicles, i.e., Incentive Policy Perception, Price Value, Functional Value, Cognitive Status, Infrastructure Barrier, and Perceived Risk.

Perceived Usefulness has a significant positive effect on Attitude Toward EV. Chen and Lu (2016) stated that Perceived Usefulness is a consumer action to observe environmentally friendly products that will improve their quality of life, thus affecting their consumption intentions. If a product is considered useful, people tend to have a positive attitude that encourages willingness to accept it (Wang et al., 2021a).

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

Perceived Ease of Use has a significant positive effect on Attitude Toward EV. According to Davis (1989), people tend to use simpler things. When consumers find a certain technology easy to operate, they tend to form a positive attitude towards it (Loengbudnark et al., 2022). Butt and Singh (2022) argued that Perceived Ease of Use positively affects behavioral intentions to use electric vehicles. People will use electric vehicles if they are easy to use and have access and resources to use them.

Attitude Toward EVs has a significant positive effect on EV Purchase Intention. Loengbudnark et al. (2022) asserted that Attitude refers to certain technologies that positively influence the intention to accept these technologies or vice versa. Zaremohzzabieh et al. (2021) stated that consumers with a caring attitude towards the environment will try to learn about environmentally friendly products and tend to buy them than conventional products. Individuals who develop positive opinions or attitudes toward buying EVs are more likely to take action to buying EVs (Vafaei-Zadeh et al., 2022).

Subjective Norms have a significant positive effect on EV Purchase Intention. Shakeel (2022) stated that there is a significant relationship between Subjective Norms and EV Purchase Intention. In this case, social pressure will influence consumer action or interest in buying an electric vehicle. If many individuals important to a person take pro-environmental actions, it becomes rational for that person to follow (Vafaei-Zadeh et al., 2022). Subjective Norms are consumers' beliefs that someone valuable to them can influence their EV Purchase Intention (Huang & Ge, 2019).

Perceived Behavioral Control has a significant positive effect on EV Purchase Intention. Perceived Behavioral Control in electric vehicles refers to an individual's perception of the difficulty in performing certain behaviors. Potential consumers with the ability and resources will be more confident that purchasing an electric vehicle can be done in the future. Thus, if consumers feel the ease of purchasing and using electric vehicles, it increases consumer interest to purchase them (Shakeel, 2022).

Incentive Policy Perception has a positive but insignificant effect on EV Purchase Intention. In this case, financial policies significantly influence EV Purchase Intention, because they directly encourage consumers to purchase at various discounts (X. W. Wang et al., 2021). However, public perceptions of policies that are informational or convenient in nature do not have a significant effect on EV Purchase Intention. It may be because not all policies regarding driving comfort are implemented. Therefore, people tend to be unwilling to use electric vehicles. The inconsistency of policies also causes a negative perception of EV Purchase Intention (Han et al., 2017).

Price Value has a significant positive effect on EV Purchase Intention. Price Value affects individual behavioral intentions to use new technology (Venkatesh et al., 2012). If the benefits of the product exceed its cost, consumers perceive the product or service to be of good value (Tarei et al., 2021). Electric vehicles, using less power than gasoline and more efficient than conventional combustion engines, run on electricity. In the long run, this will help to cut transport costs and is cost effective. Consumers will prefer buying and using electricity vehicles when they are aware of the cost savings that can be achieved with this type of vehicle (Weiss et al., 2019; Weldon et al., 2018).

Functional Value has a positive but insignificant effect on EV Purchase Intention. It does not follow a study by Febransyah (2021) demonstrating that functionality is the most important factor consumers consider in purchasing a vehicle. Based on the consumer's point of view, consumers will not diversify all the functions available in a product and will only choose the product that makes the most sense to use (Kato, 2021). It has been confirmed that increasing the number of choices and functions does not affect consumer purchasing behavior (Kato & Tsuda, 2019). As a result, even if a product is objectively superior, it will easily be surpassed by a product that has utility value that appeals to consumer sensibilities. This phenomenon is called feature fatigue and makes products equipped with excessive functions less attractive to consumers (Kato, 2021).

Cognitive Status has a significant effect on EV Purchase Intention. Huang and Ge (2019) showed that it is more likely that consumers who know more about EVs and the incentives offered by the government will buy them. Ozaki and Sevastyanova (2011) stated that knowledge about an innovation can motivate consumers to learn more about its functions until it is adopted. It shows busy communication about electric vehicles and the potential benefits of their functions.

Infrastructure Barrier has a significant negative effect on EV Purchase Intention. Biresselioglu et al. (2018) argued that the lack of EV-supporting infrastructure is the most significant barrier to EV adoption by the public. Giansoldati et al. (2020) argued that the absence of charging facilities is the most significant barrier to EV adoption. Skippon and Garwood (2011) claimed that the availability of charging facilities makes most respondents consider using electric vehicles. The availability of charging infrastructure may influence the growth rate of electric vehicle mobility.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

Perceived Risk has a negative but insignificant effect on EV Purchase Intention. Risk is an essential psychological variable in social science. Featherman et al. (2021) suggest that risk assessment is difficult for consumers to carry out because this reduces the enjoyment of the consumer's consumption process, thereby making purchasing decisions more complicated. Furthermore, risk assessments are often influenced by personal bias. consumers will tend to avoid risky decisions to maintain their mood, so consumers will ignore potential risks in their purchasing decisions and prefer to focus on hedonic benefits or positive consumption emotions.

CONCLUSION

The adoption of electric vehicles not only aims to reduce emissions and save fuel energy. However, it is also an effort to maintain sustainable development in the automotive industry. This study uses the C-TAM-TPB model to determine EV Purchase Intention in Indonesia using Perceived Usefulness, Perceived Ease of Use, Attitude toward EV, Subjective Norms, and Perceived Behavioral Control. In addition, this study also expands the research variables by adding other factors that consumers consider before buying an electric vehicle. These factors are Incentive Policy Perception, Price Value, Functional Value, Cognitive Status, Infrastructure Barrier, and Perceived Risk.

Based on the study results, Perceived Usefulness and Perceived Ease of Use significantly and positively affect Attitudes Toward EV. Furthermore, Attitude Toward EVs, Price Value, and Cognitive Status significantly and positively affect EV Purchase Intention. Meanwhile, the Infrastructure Barrier significantly and negatively affects EV Purchase Intention. Meanwhile, Incentive Policy Perception, Functional Value, and Perceived Risk insignificantly affect EV Purchase Intention.

RECOMMENDATION

The first variable that has the greatest influence on Attitude Towards EV is Perceived Usefulness. This indicates that stakeholders can increase the usefulness of electric vehicles to society. Marketers can also improve public perceptions and attitudes towards the usefulness of electric vehicles. Apart from that, electric vehicle manufacturers can add various features that make it easier for people to drive. The second variable that has the greatest influence on Attitude Towards EV is Perceived Ease of Use. This indicates that stakeholders can increase ease of access to drive electric cars anywhere to increase public perception of electric vehicles.

The first variable that has the greatest influence on EV Purchase Intention is Perceived Behavioral Control. This indicates that stakeholders can encourage people to use electric vehicles to travel. In this case, electric vehicles must be available when consumers want to buy and use them.

The second variable that has the greatest influence on EV Purchase Intention is Price Value. This indicates that stakeholders can make electric vehicles cheaper to increase people's desire to buy electric vehicles. The decline in electric vehicle prices is an important driving factor for electric vehicle sales.

The third variable that has the greatest influence on EV Purchase Intention is Attitude Towards EV. This indicates that stakeholders can increase public satisfaction in using electric vehicles to increase people's desire to buy electric vehicles. With increasing public awareness and attitudes towards environmentally friendly behavior, stakeholders can use it to market electric vehicles which are considered more environmentally friendly than conventional vehicles.

The fourth variable that has the greatest influence on EV Purchase Intention is Cognitive Status. This indicates that stakeholders can increase public understanding of electric car product brands to increase people's desire to buy electric vehicles. In this case the government and manufacturers can take steps to provide more information about electric vehicles and relevant policies to encourage people to buy electric vehicles. It is critical for companies and governments to collaborate to educate consumers about electric vehicles.

The fifth variable that has the greatest influence on EV Purchase Intention is Subjective Norms. This indicates that stakeholders can increase recommendations from relatives to consumers to increase their influence on consumers buying electric cars. Subjective Norms can be subjective opinions from friends, family, mass media, government policies and available information regarding electric vehicles. Stakeholders can provide various positive opinions regarding electric vehicles to increase people's desire to buy electric vehicles. With positive opinions about electric vehicles from various parties, it will encourage people to buy electric vehicles.

The sixth variable that has the greatest influence on EV Purchase Intention is Infrastructure Barrier. This indicates that stakeholders can increase the availability of reliable electrical energy for charging electric vehicles to increase consumers' desire to buy electric cars. To facilitate charging, policymakers should not only focus on the number of charging stations, but also consider the

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

location, distribution, and universality of charging infrastructure. With the lower Infrastructure Barrier, it will increase people's desire to buy electric vehicles.

To address several identified limitations, this study presents several recommendations for future research: This research does not divide the three types of electric vehicles HEV, PHEV, and EV. These three types of vehicles have different features and performance. Therefore, aspects of perceived usefulness or functionality cannot be fully applied to a specific product. Future research can differentiate these three classifications of electric vehicles to obtain specific results. Furthermore, this research did not examine further geographical conditions in Indonesia, such as city/district areas, provinces, or other geographical aspects that might result in different perceptions of respondents due to differences in infrastructure, Electric Vehicle product and price, or other differences.

REFERENCES

1. Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Process*, *50*. https://doi.org/https://doi.org/10.1016/0749-5978(91)90020-T
2. Biresselioglu, M. E., Demirbag Kaplan, M., & Yilmaz, B. K. (2018). Electric mobility in Europe: A comprehensive review of motivators and barriers in decision making processes. *Transportation Research Part A: Policy and Practice*, *109*(January), 1–13. https://doi.org/10.1016/j.tra.2018.01.017
3. Butt, M. M. H., & Singh, J. G. (2022). Factors Affecting Electric Vehicle Acceptance, Energy Demand and Co2 Emissions in Pakistan. *SSRN Electronic Journal*, *2*(3), 100081. https://doi.org/10.2139/ssrn.4153365
4. Cecere, G., Corrocher, N., & Guerzoni, M. (2018). Price or performance? A probabilistic choice analysis of the intention to buy electric vehicles in European countries. *Energy Policy*, *118*(March), 19–32. https://doi.org/10.1016/j.enpol.2018.03.034
5. Chen, S., & Lu, C. (2016). A Model of Green Acceptance and Intentions to Use Bike-Sharing : YouBike Users in Taiwan. *Networks and Spatial Economics*, 1103–1124. https://doi.org/10.1007/s11067-015-9312-8
6. Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *JSTOR*, *13*(3), 319–340. https://doi.org/10.5962/bhl.title.33621
7. Dwipayana, A. D., Pradana, A., & Sulistyo, A. B. (2023). Barriers to Electric Car Acceptance : Analysis of Consumer Perceptions Regarding Safety and Security. *ASTONJADRO*, *12*(2), 469–479.
8. Featherman, M., Jia, S. (Jasper), Califf, C. B., & Hajli, N. (2021). The impact of new technologies on consumers beliefs: Reducing the perceived risks of electric vehicle adoption. *Technological Forecasting and Social Change*, *169*(December 2020), 120847. https://doi.org/10.1016/j.techfore.2021.120847
9. Febransyah, A. (2021). Predicting purchase intention towards battery electric vehicles: A case of indonesian market. *World Electric Vehicle Journal*, *12*(4). https://doi.org/10.3390/wevj12040240
10. GAIKINDO. (2023). *Gaikindo Data Wholesales January - December 2022*.
11. Gandajati, A. F., & Mahyuni, L. P. (2022). Kendaraan Listrik di Mata Gen Y: Faktor Apa yang Menjelaskan Minat Belinya? *Forum Ekonomi: Jurnal Ekonomi, Manajemen Dan Akuntansi*, *24*(4), 717–723. https://doi.org/10.30872/jfor.v24i4.10436
12. Giansoldati, M., Monte, A., & Scorrano, M. (2020). Barriers to the adoption of electric cars: Evidence from an Italian survey. *Energy Policy*, *146*(June), 111812. https://doi.org/10.1016/j.enpol.2020.111812
13. Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook. In *Structural Equation Modeling: A Multidisciplinary Journal* (Vol. 30, Issue 1). Springer Nature Switzerland.
14. Han, L., Wang, S., Zhao, D., & Li, J. (2017). The intention to adopt electric vehicles: Driven by functional and non-functional values. *Transportation Research Part A: Policy and Practice*, *103*, 185–197. https://doi.org/10.1016/j.tra.2017.05.033
15. Hu, X., Zhou, R., Wang, S., Gao, L., & Zhu, Z. (2023). Consumers' value perception and intention to purchase electric vehicles: A benefit-risk analysis. *Research in Transportation Business and Management*, *49*(July 2022), 101004. https://doi.org/10.1016/j.rtbm.2023.101004
16. Huang, X., & Ge, J. (2019). Electric vehicle development in Beijing : An analysis of consumer purchase intention. *Journal of Cleaner Production*, *216*, 361–372. https://doi.org/10.1016/j.jclepro.2019.01.231
17. Indrawati, & Haryoto, K. S. (2015). The Use of Modified Theory of Acceptance and Use Of Technology 2 to Predict Prospective Users' Intention in Adopting TV Streaming. *Proceedings of the 5th International Conference on Computing and*

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

Informatics, ICOCI 2015, *125*, 206–215.
18. Junquera, B., Moreno, B., & Álvarez, R. (2016). Analyzing consumer attitudes towards electric vehicle purchasing intentions in Spain: Technological limitations and vehicle confidence. *Technological Forecasting and Social Change*, *109*, 6–14. https://doi.org/10.1016/j.techfore.2016.05.006
19. Kato, T. (2021). Functional value vs emotional value: A comparative study of the values that contribute to a preference for a corporate brand. *International Journal of Information Management Data Insights*, *1*(2), 0–6. https://doi.org/10.1016/j.jjimei.2021.100024
20. Kato, T., & Tsuda, K. (2019). Impact of the Variety of Functional Options on Willingness to Pay. *Proceedings of the 20th Asia Pacific Industrial Engineering & Management Systems*, *July*, 85–90.
21. Krishnan, V. V., & Koshy, B. I. (2021). Evaluating the factors influencing purchase intention of electric vehicles in households owning conventional vehicles. *Case Studies on Transport Policy*, *9*(3), 1122–1129. https://doi.org/10.1016/j.cstp.2021.05.013
22. Li, W., Long, R., Chen, H., & Geng, J. (2017). A review of factors influencing consumer intentions to adopt battery electric vehicles. *Renewable and Sustainable Energy Reviews*, *78*(December 2016), 318–328. https://doi.org/10.1016/j.rser.2017.04.076
23. Loengbudnark, W., Khalilpour, K., Bharathy, G., Taghikhah, F., & Voinov, A. (2022). Battery and hydrogen-based electric vehicle adoption: A survey of Australian consumers perspective. *Case Studies on Transport Policy*, *10*(4), 2451–2463. https://doi.org/10.1016/j.cstp.2022.11.007
24. Matthews, L., Hair, J., & Matthews, R. (2018). PLS-SEM: The Holy Grail for Advanced Analysis. *Marketing Management Journal*, *28*(1), 14–15.
25. Miranda, J. L., & Delgado, C. J. M. (2020). Determinants of electric car purchase intention in Portugal. *Developments in Corporate Governance and Responsibility*, *15*, 161–172. https://doi.org/10.1108/S2043-052320200000015009
26. Mpoi, G., Milioti, C., & Mitropoulos, L. (2023). Factors and incentives that affect electric vehicle adoption in Greece. *International Journal of Transportation Science and Technology*, *xxxx*, 1–16. https://doi.org/10.1016/j.ijtst.2023.01.002
27. Noppers, E., Keizer, K., Milovanovic, M., & Steg, L. (2019). The role of adoption norms and perceived product attributes in the adoption of Dutch electric vehicles and smart energy systems. *Energy Research and Social Science*, *57*(October 2018), 101237. https://doi.org/10.1016/j.erss.2019.101237
28. Ozaki, R., & Sevastyanova, K. (2011). Going hybrid : An analysis of consumer purchase motivations. *Energy Policy*, *39*(5), 2217–2227. https://doi.org/10.1016/j.enpol.2010.04.024
29. Rahardi, R. A. M., & Rachmawati, I. (2023). Pendekatan Hierarki Kebutuhan Maslow pada Motivasi Pembelian Electric Vehicle di Indonesia. *Jurnal Riset Manajemen (IMAGE)*, *12*(1), 13–26.
30. Safarian, S. (2023). Environmental and energy impacts of battery electric and conventional vehicles: A study in Sweden under recycling scenarios. *Fuel Communications*, *14*(December 2022), 100083. https://doi.org/10.1016/j.jfueco.2022.100083
31. Shakeel, U. (2022). Electric vehicle development in Pakistan: Predicting consumer purchase intention. *Cleaner and Responsible Consumption*, *5*(November 2021). https://doi.org/10.1016/j.clrc.2022.100065
32. She, Z. Y., Qing Sun, Ma, J. J., & Xie, B. C. (2017). What are the barriers to widespread adoption of battery electric vehicles? A survey of public perception in Tianjin, China. *Transport Policy*, *56*(July 2016), 29–40. https://doi.org/10.1016/j.tranpol.2017.03.001
33. Sierzchula, W., Bakker, S., Maat, K., & Wee, B. Van. (2014). The in fluence of financial incentives and other socio-economic factors on electric vehicle adoption. *Energy Policy*, *68*, 183–194. https://doi.org/10.1016/j.enpol.2014.01.043
34. Singh, H., Singh, V., Singh, T., & Higueras-Castillo, E. (2023). Electric vehicle adoption intention in the Himalayan region using UTAUT2 – NAM model. *Case Studies on Transport Policy*, *11*(August 2022). https://doi.org/10.1016/j.cstp.2022.100946
35. Skippon, S., & Garwood, M. (2011). Responses to battery electric vehicles : UK consumer attitudes and attributions of symbolic meaning following direct experience to reduce psychological distance. *Transportation Research Part D*, *16*(7), 525–531. https://doi.org/10.1016/j.trd.2011.05.005

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 12 December 2023
DOI: 10.47191/ijcsrr/V6-i12-61, Impact Factor: 6.789
IJCSRR @ 2023

36. Tarei, P. K., Chand, P., & Gupta, H. (2021). Barriers to the adoption of electric vehicles: Evidence from India. *Journal of Cleaner Production*, *291*, 125847. https://doi.org/10.1016/j.jclepro.2021.125847
37. Taylor, S., & Todd, P. (1995). Understanding information technology usage: A Test of Competing Model. In *Information Systems Research* (Vol. 6, Issue 2, pp. 144–176). https://www.jstor.org/stable/23011007
38. Tu, J. C., & Yang, C. (2019). Key factors influencing consumers' purchase of electric vehicles. *Sustainability (Switzerland)*, *11*(14). https://doi.org/10.3390/su11143863
39. Utami, M. W. Dela, Yuniaristanto, Y., & Sutopo, W. (2020). Adoption Intention Model of Electric Vehicle in Indonesia. *Jurnal Optimasi Sistem Industri*, *19*(1), 70–81. https://doi.org/10.25077/josi.v19.n1.p70-81.2020
40. Vafaei-Zadeh, A., Wong, T. K., Hanifah, H., Teoh, A. P., & Nawaser, K. (2022). Modelling electric vehicle purchase intention among generation Y consumers in Malaysia. *Research in Transportation Business and Management*, *43*(February 2021), 100784. https://doi.org/10.1016/j.rtbm.2022.100784
41. Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, *36*(1), 157–178. https://doi.org/10.1109/MWSYM.2015.7167037
42. Wang, N., Tang, L., & Pan, H. (2018). Analysis of public acceptance of electric vehicles: An empirical study in Shanghai. *Technological Forecasting and Social Change*, *126*(June 2017), 284–291. https://doi.org/10.1016/j.techfore.2017.09.011
43. Wang, R., Zhao, X., Wang, W., & Jiang, L. (2021). What factors affect the public acceptance of new energy vehicles in underdeveloped regions? A case study of Gansu Province, China. *Journal of Cleaner Production*, *318*(967). https://doi.org/10.1016/j.jclepro.2021.128432
44. Wang, X. W., Cao, Y. M., & Zhang, N. (2021). The influences of incentive policy perceptions and consumer social attributes on battery electric vehicle purchase intentions. *Energy Policy*, *151*(February). https://doi.org/10.1016/j.enpol.2021.112163
45. Weiss, M., Zerfass, A., & Helmers, E. (2019). Fully electric and plug-in hybrid cars - An analysis of learning rates, user costs, and costs for mitigating CO 2 and air pollutant emissions. *Journal of Cleaner Production*, *212*, 1478–1489. https://doi.org/10.1016/j.jclepro.2018.12.019
46. Weldon, P., Morrissey, P., & O'Mahony, M. (2018). Long-term cost of ownership comparative analysis between electric vehicles and internal combustion engine vehicles. *Sustainable Cities and Society*, *39*, 578–591. https://doi.org/10.1016/j.scs.2018.02.024
47. Widodo, A., & Wahid, N. A. (2023). Mediating Role of Environmental Attitude Between Consumers' Satisfaction and Repeat Purchase of Eco-friendly Petrol in Indonesia. *Jurnal Manajemen Indonesia*, *23*(2), 168. https://doi.org/10.25124/jmi.v23i2.5461
48. Yasyi, D. (2022). *Electric Vehicles Sales Southeast Asia Countries 2022 | Seasia.co*. https://seasia.co/2022/12/02/electric-vehicles-sales-southeast-asia-countries-2022
49. Yuliani, P. A. (2021). *Kendaraan Bermotor Penyumbang Utama Polusi Udara*. https://m.mediaindonesia.com/infografis/detail_infografis/442518-kendaraan-bermotorpenyumbang-utama-polusi-udara
50. Zaremohzzabieh, Z., Ismail, N., Ahrari, S., & Abu Samah, A. (2021). The effects of consumer attitude on green purchase intention: A meta-analytic path analysis. *Journal of Business Research*, *132*(May 2019), 732–743. https://doi.org/10.1016/j.jbusres.2020.10.053
51. Zhang, T., Tao, D., Qu, X., Zhang, X., Zeng, J., Zhu, H., & Zhu, H. (2020). Automated vehicle acceptance in China: Social influence and initial trust are key determinants. *Transportation Research Part C: Emerging Technologies*, *112*(January), 220–233. https://doi.org/10.1016/j.trc.2020.01.027