PREDICTION OF GREEN PURCHASE INTENTION FOR ELECTRIC VEHICLES: A THEORY OF PLANNED BEHAVIOR APPROACH

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ABSTRACT: The campaign to switch to electric vehicles (EVs) has been reinforced to reduce global air pollution and greenhouse gas emissions. This study focuses on expanding the theory of planned behavior by adding external factors (charging facilities and vehicle performance) and individual factors (environmental concerns and knowledge), leading to green purchase behavior for electric vehicles. Data were collected from 239 respondents who use electric vehicles in East Java, Indonesia, and analyzed using Smart PLS. The results showed that Attitude, Subjective Norm, Knowledge, and Vehicle Performance affected Green purchase intention for Electric Vehicles (GPIEV). However, environmental concerns and Perceived behavioral control and Charging Facilities did not affect GPIEV. The results imply that attitudes in the form of perceptions about particular behaviors directly contribute to their interest in purchasing electric vehicles.

Keywords*: Environmental Concern; Vehicle Performance; Charging facilities; Knowledge; Green Purchase Intention to Electric Vehicle*

INTRODUCTION

Data from GAIKINDO (Indonesian Association of Automotive Industries) showed an increase in car sales by 67% (2020 sales of 532,403 units and sales in 2021 of 887,200 units. Likewise, domestic motorcycle sales in 2021 amounted to 5,057,516, and for export sales in 2021, there will be 803,931. High sales of cars and motorbikes will result in higher fuel consumption (GAIKINDO, 2022). In recent years, researchers in Indonesia and around the world have learned that oil and coal are important energy sources that continue to increase from year to year (Sperling & DeLuchi, 1989).

To overcome this situation, electric vehicles or electric vehicles (EVs) are an important step in reducing the environmental problems of transportation that use electric batteries as energy, and many countries have considered this technology (Li et al., 2017). The domestic automotive industry is now preparing to welcome the era of green and electric vehicles. Producers and the government are preparing a low-emission vehicle acceleration program through the Ministry of Industry. In addition, the government is preparing financial and non-financial policy support to enable people to use electric vehicles without incurring large additional costs. To achieve this goal, the government has developed a strategy to support the development of low-carbon vehicles (LCEV). The Ministry of Transportation noted that the number of battery-powered electric vehicles (KBLBB) in Indonesia would reach tens of thousands in July 2022 (Dananjaya & Ferdian, 2022). Several studies have shown that electric vehicles are much more efficient and environmentally friendly (Ma et al., 2017; Shi et al., 2016; Hoen & Koetse, 2014).

The role of environmental concern (EC) variables have also been demonstrated in exploratory studies highlighting environmental protection as a motivator for adopters' decisions to adopt EV Egbue & Long (2012) and Papaoikonomou et al., (2020). EC is the most important determinant, contributing to individuals changing their current behavior towards a more environmentally friendly behavior. The findings of previous studies show that Taiwanese consumers' EC positively influences attitude, subjective norms, perceived behavioral control, and willingness to buy environmentally friendly products, such as EV consumption (Dutta & Hwang, 2021). The theory of Planned Behavior (TPB) is a suitable basic theory for this research because consumer behavior is an important factor in participation, consumption, and recruitment. However, previous research on electric vehicle consumption behavior was improved by adding other green consumer behavior motivational variables (Rezvani et al., 2015).

Most consumer behavioral analyzes of individual influence on green purchase behavior assume that environmental knowledge and beliefs lead to green purchase behavior that influences customer environmental awareness and concern (Zhang & Dong, 2020). This environmentally friendly buying behavior is usually related to green purchase intention (Chan, 2017).

Several other motivations affect the green purchase intention of electric vehicles (EV), such as public support for EV promotion policies, EV knowledge,

EV performance (Vehicle Performance), and concerns about the coverage of charging infrastructure (Charging Facilities) (Sovacool et al., 2019). The ability to use charging facilities and the ability to use alternative modes of transportation for long-distance travel is a form of self-efficacy that consumers feel has a positive correlation with the intention to use electric vehicles (Bockarjova & Steg, 2014). Likewise, Srivastava & Thakur, (2021) Knowledge positively influences consumer willingness to adopt pro-environmental behavior. Previous studies have shown knowledge to be the main predictor of readiness to use electric vehicles (Rezvani et al., 2015). However, in contrast to the findings of Savacool et al. (2019), knowledge does not appear to be significantly related to willingness to adopt EVs. Sovacool et al. (2018) explored EV preferences in the Nordic region with a demographic approach; the results show that the most active market segments in adopting EVs are (1) highly educated men working full time, especially in civil society or academic positions, and those with under middle age (30-45); (2) women with higher incomes (3) Retired.

The purpose of this study is to investigate the green purchase intention of electric vehicles by using TPB as the basis for a conceptual framework adapted from the research results of Dutta & Hwang, (2021) and adding other antecedent Charging Facilities and Vehicle Performance developed by Sovacool et al. (2019) as a research novelty and adapted to government policies in Indonesia

The urgency of this research is: that EV is a new policy introduced by the Indonesian government, and from the perspective of environmental issues, EV is a topic worth considering. Therefore, in order to combat the increase in CO2 in the environment, the government needs to examine the factors that directly and indirectly influence consumer intentions to adopt this innovation for environmentally friendly vehicles.

Likewise, although adopting eco-friendly electric vehicles in developed countries has been studied extensively, more research needs to be conducted to examine these factors in the Indonesian context. As a result of its potent preemptive power, TPB has grown to be one of the most widely accepted theories in social psychology and has been used to forecast behaviour from a wide range of research angles. Furthermore, TPB has the potential to broaden the conventional framework to provide a more comprehensive explanation of the variables impacting consumers' self-interest as the primary driver of pro-environmental behaviour, such as their intention to purchase electric vehicles or go green. The literature shows that different countries face different challenges in launching new products due to their differences in culture, demographics, and social conventions. Therefore, it is advisable to consider country-specific factors such as Indonesia.

THEORETICAL REVIEW

Theory of Planned Behaviour

The theory of planned behaviour (Ajzen, 1991) and the theory of environmentally significant behaviour (Stern, 2000) are two theories that might

serve as a foundation for researching green purchasing behaviour. Green consumer behaviour is typically associated with those who value self-transcendence (altruism), openness, and universal values such as preserving human and environmental sustainability. Studies on consumer behaviour have demonstrated that because customer intention considers pertinent variables that influence behaviour, it is a useful tool for understanding and forecasting individual behaviour (Ajzen, 2005). TPB is able to elucidate the variables influencing personal purpose. The Theory of Reasoned Action (TRA) was superseded by TPB, which was established by Ajzen in 2005 to describe how customers behave during decision-making (Ajzen, 2005). TRA suggested that the driving elements are attitude and subjective norm. The perceived behavioral control variable was included by (Ajzen, 2005) in order to increase the TRA's interpretative ability. Perceived behavioral control has the ability to both directly and indirectly influence behavior in TPB. TPB has been extensively used to study environmentally friendly intents and behavior connected to green buying behavior, such as EV intention with environmental benefit, because of this compelling rationale (Zhang et al., 2018).

According to Degirmenci & Breitner (2017), environmental concerns play a substantial but not exclusive role in the EV. Some theories view knowledge as a significant determinant of human behaviour, including sustainable conduct. For instance, knowledge is a component of perceived behavioural control in Ajzen's TBP. With the combination of the previous results from other researchers and the theoretical theory of planned behavior and green purchase behavior to electric vehicles, this study focuses on extending of the theory of planned behavior, by adding that it is influenced by individual factors (such as environmental concerns and knowledge) and situational factors (charging facilities and vehicle performance.

Environmental concerns have increased dramatically in recent years due to serious environmental concerns and government demands for environmental protection. Therefore, environmental protection or consumer trust is a potential factor influencing the decision to use environmentally friendly products. Various studies on the consumption of environmentally friendly electric vehicles show that electric vehicles are an environmental innovation that can alleviate environmental problems in the transportation sector. Lai et al. (2015) proposed that EC influences individual behavioral intentions through norms (SN), attitudes (AT), and beliefs (PBC). More specifically, EC is a direct and indirect determinant of GPIEV and a major factor like the model developed by TPB. The GPI for EV adoption is positively influenced by EC, which also influences consumer attitudes (AT), subjective norms (SN), and perceived behavioral control (PBC). So the hypothesis in this study is:

H1: Environmental Concern (EC) influences Attitude (AT)
H2: Environmental Concern (EC) influences Subjective Norm (SN)
H3: Environmental Concern (EC) influences Perceived Behavioral Control (PBC)
H4: Environmental Concern (EC) influences GPIEV

Attitude (AT) is a person's evaluation of something he likes or dislikes (Ajzen, 1991). Several studies have shown a positive influence between attitudes and intentions in the context of pro-environmental behavior. Several studies show a positive correlation between consumer attitudes and willingness to adopt new technologies, especially electric vehicles. Zhang et al. (2018) and Yurdakul & Kazan (2020) found that environmental innovation has a direct impact on pollution control, resource conservation, and recycling.

Subjective Norm (SN) is the social pressure that an individual feels to perform a behavior or is the social pressure from family, friends, or other people that a person feels when deciding to do something or not. The higher the perceived stress, the more likely there is an intention to act (Ajzen, 1991). The results of previous studies showed a positive effect between SN and intention, like Chen & Tung (2009). SN positively influences behavioral intention (Dutta & Hwang, 2021; Lizin et al., 2017). But they say that due to high social pressure, those who believe they will achieve certain behaviors are more likely to do so (Papaoikonomou et al., 2020).

Perceived Behavioral Control (PBC) is the level of control an individual has over his actions (Ajzen, 1991). Perceived individual control ability and self-efficacy are factors related to behavior. Several studies have shown a positive effect between PBC and an individual's behavioral intention (Lizin et al., 2017). However, there is also the opposite (Ma et al., 2018). So it can be hypothesized:

H5: Attitude (AT) influences GPIEV
H6: Subjective Norm (SN) influences GPIEV
H7: Perceived Behavioral Control (PBC) influences GPIEV

Situational factors, in addition to personal formation as observed in the TPB, also have an impact on the attitudes and behaviours of consumers when they purchase electric vehicles. Long charging periods and limited infrastructure are two charging issues influencing a buyer's decision to purchase an electric vehicles (Adhikari et al., 2020). To overcome this problem, Jiang et al. (2021) suggested that replacing replaceable batteries could increase consumer intent, given the significantly reduced overall charge time. Chiou (1998) found that perceived value affects Attitude. Charging Facilities affect consumers' intention to use electric vehicles and their Attitude (AT) (Asensio et al., 2021). The next hypothesis is:

H8: Charging Facilities influences Attitude (AT)
H9: Charging Facilities influences GPIEV

The findings of the Dutta & Hwang (2021) Vehicle Performance study, such as safety, reliability, and range, influence Taiwanese consumers' perceived behavioral control (PBC). Shows that vehicle performance is an important concern influencing the behavior of Taiwanese consumers. Jiang et al. (2021) concluded that Vehicle Performance, especially driving distance and safety, is the main determining factor influencing consumer-perceived behavioral control. Therefore the next hypothesis is:

H10: Vehicle Performance influences Perceived Behavioral Control (PBC)

Environmental knowledge recognizes some symbols, concepts, and behavior patterns related to environmental protection (Vincente-Molina et al., 2013). Furthermore, Hassan (2014) research found that consumers with good environmental knowledge have a more positive attitude towards environmentally friendly products and are willing to pay extra to buy these environmentally friendly products. Therefore the next hypothesis is:
H11: Knowledge (KN) influences Attitude (AT)

Environmental knowledge recognizes some symbols, concepts, and behavior patterns related to environmental protection (Vincente-Molina et al., 2013). Furthermore, Hassan (2014) research found that consumers with good environmental knowledge have a more positive attitude towards environmentally friendly products and are willing to pay extra to buy these environmentally friendly products. Therefore the next hypothesis is and all hypotheses are in Figure 1.
H12: Knowledge (KN) influences GPIEV
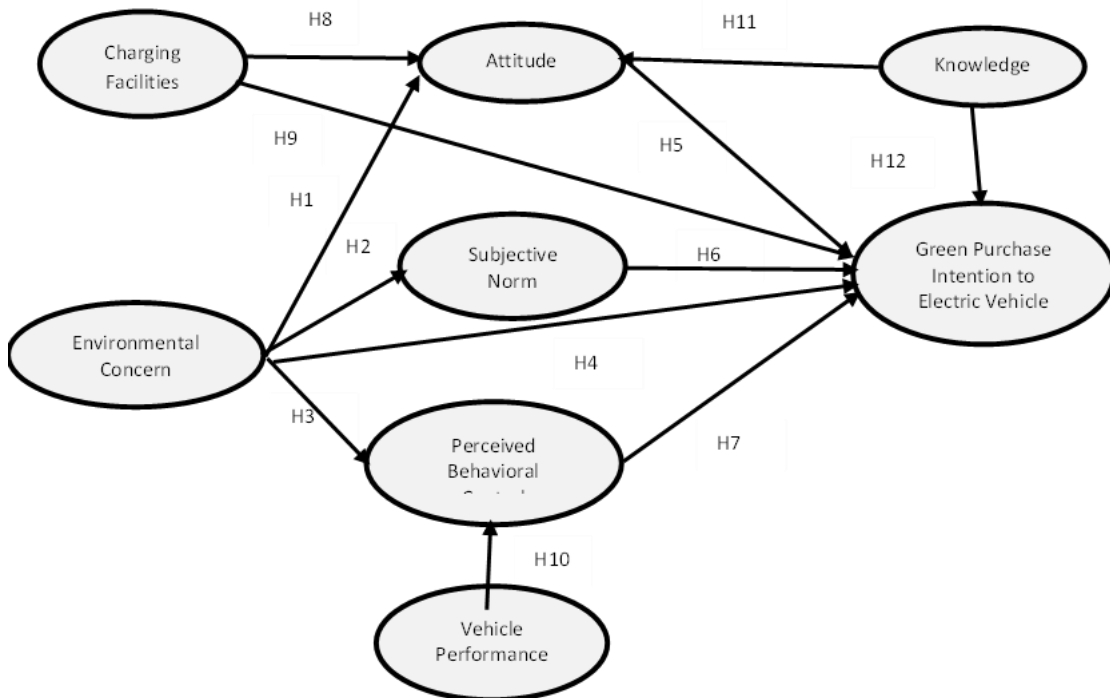

Figure 1. Conceptual Framework

METHODOLOGY

Population and sample

The population in this study are people who have used or are currently using electric vehicles in East Java. The sample in this study used purposive sampling with the criteria of being 17 years old, owning an electric vehicle and being domiciled in East Java. Before being distributed to study participants, the

validity and reliability of the questionnaire were examined. A five-point Likert scale, with 1 denoting strongly disagree and 5 denoting strongly agree, was used to verify each item. For each estimated parameter, Hair et al. (2011) recommended a minimum sample size of 5–10 observations. Since there are 34 estimated factors in this study, a minimum sample size of about 170 respondents is required. From the results of sending online questionnaires using the Google form for three months March-November 2023, 239 respondents sent their answers. They were all chosen since they met the specified requirements and were all-inclusive.

Measurement

Construct reliability test can be recognized by the Cronbach alpha score. Confidence measures the internal consistency of the variables'indices, indicating the degree to which each row points to a common variable. The configuration confidence bound is at least 0.60 (Ghozali, 2014). Variables measurements are based on a 1-7 Likert scale. Therefore, the normalized load factor will be >0.70. According to Hair et al. (2011), standart factor loading > 0.50 are great importance in terms of each element's relative importance and importance. Therefore, Appendix 1 and Figure 2 compile the observed variables with a decision of acceptable measures in the validity and reliability.
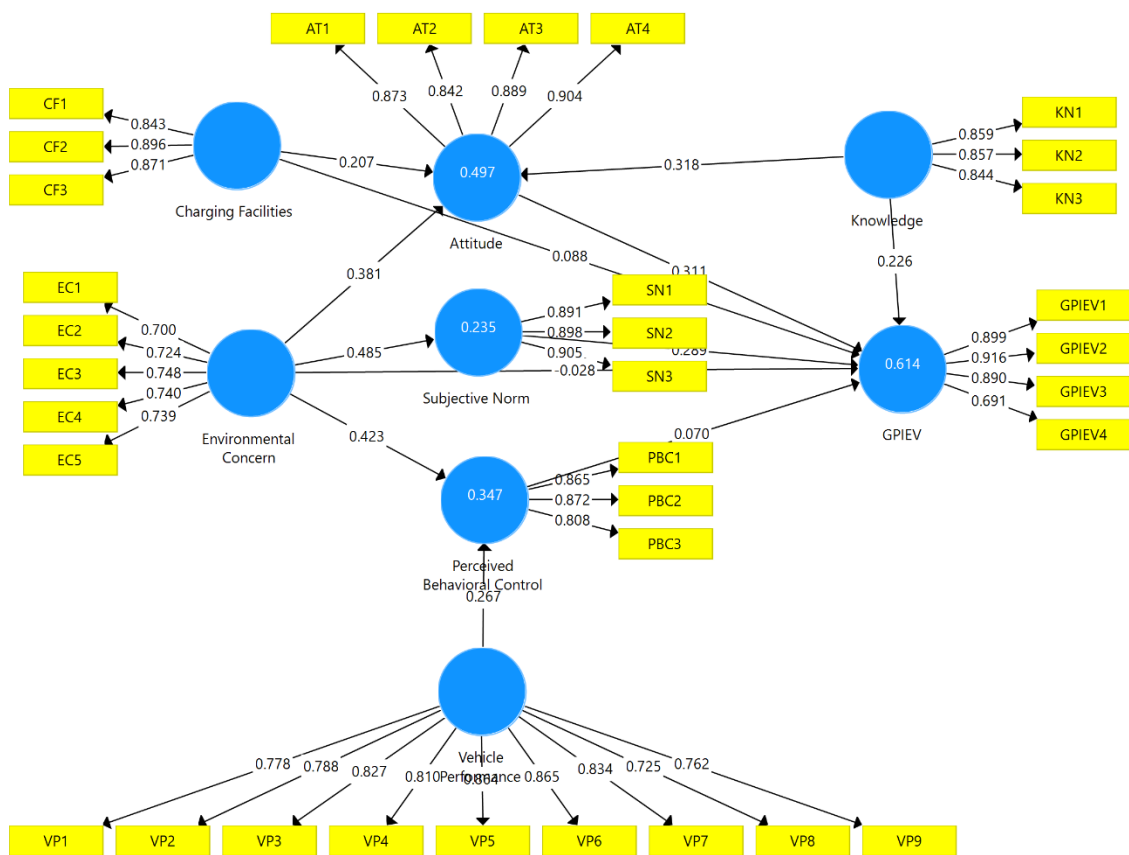

Figure 2. Measurement model assessment

Analysis

Analysis in this study is divided into two areas: descriptive analysis and inferential analysis. This analysis is used to determine the characteristics of the respondents in this survey. Inferential analysis using SEM and Smart PLS. The steps to take are (1) A measurement model (external model) is one in which the observed variables are is the latent variable to be measured Structural model (inner model) Measures estimation performance among latent variables (Ghozali, 2005). Data were collected to answer research objectives and proposed concepts framework model, data were analyzed with PLS-SEM using Smart PLS. Hair et al. (2011) evaluated the data using inner and outer measurements. Hypothesis testing is then performed according to the proposed model.

RESULTS

Respondent Characteristic

Table 1 shows the characteristics of the respondents from this study among 239 respondents, the majority were Male or 51.4%, aged 15-25 years or around 52.7%, with a monthly expenditure of between one million and three million rupiahs, around 39.3 %.

Table 1. Descriptions of Respondents

Demographic notes	Frequency	Percentage
Gender		
Male	122	51,04%
Female	117	48.96%
Age		
15-25 years old	126	52.70%
26-35 years old	41	17.20%
36-45 years old	40	16.70%
> 45 years old	32	13.40%
Expenses/month		
< 1.000.000	64	26.80%
1.000.000-3.000.000	94	39.30%
3.000.000-5.000.000	43	18%
5.000.000-10.000.000	32	13.40%
>10.000.000	6	2.50%

Convergent Validity

This study analyses convergence validity of each construct measure by its AVE. The data is obtained by the square weight of each indicator in the construct by the average value. The minimum acceptable AVE value is 0.50 or greater (AVE>0.5). the finding of the calculation is evident from the presentation in Table 2.

Table 2. Convergent Validity

No	Variabel	Item	AVE
1	Environmental Concern	EC1, EC2, EC3, EC4, EC5	0,534
2	Knowledge	KN1, KN2, KN3	0,728
3	Charging Facilities	CF1, CF2, CF3	0,758
4	Vehicle Performance	VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8, VP9	0,651
5	Attitude	AT1, AT2, AT3, AT4	0,769
6	Subjective Norm	SN1, SN2, SN3	0,806
7	Perceived Behavioral Control	PBC1, PBC2, PBC3	0,720
8	Green Purchase Intention to electric Vehicle	GPIEV1, GPIEV2, GPIEV3, GPIEV4	0,729

The convergent validity test shows that the average variance extracted value in the environmental concern construct is 0.534> 0.50 (valid). For the value of the average variance extracted in the knowledge construct, 0.728 > 0.50 (valid). For the average variance extracted in the charging facilities, construct 0.758 > 0.50 (valid). For the value of the average variance extracted in the Vehicle Performance construct, 0.651 > 0.50 (valid). For the value of the average variance extracted in the attitude construct, 0.769 > 0.50 (valid). For the value of the average variance extracted in the subjective norm construct, 0.806 > 0.50 (valid). The average variance extracted in the Perceived Behavioral Control construct is 0.720 > 0.50 (valid). For the value of the average variance extracted in the Green Purchase Intention to Electric Vehicle construct, 0.729 > 0.50 (valid).

Discriminant Validity

In the next step, discriminant validity is evaluated. That is, how far the empirical component differs from other components of the structural model is evaluated. Discriminant validity can be shown in Table 3. From the statistical results, it can be shown that there is no high correlation between variables and the validity of discriminant validity. The results showed that the Heterotrait Monotrait (HTMT) ratio was not greater than 0.90.

Table 3. Heterotrait Monotrait ratio

	AT	CF	EC	GPIEV	KN	PBC	SN	VP
AT								
CF	0,424							
EC	0,624	0,175						
GPIEV	0,779	0,459	0,505					
KN	0,695	0,390	0,668	0,735				
PBC	0,664	0,445	0,634	0,665	0,771			
SN	0,775	0,445	0,487	0,753	0,585	0,606		
VP	0,510	0,245	0,474	0,532	0,647	0,493	0,446	

Note: AT: *Attitude*, CF: *Charging Facilities*, EC*: Environmental Concern*, GPIEV: *Green Purchase Intention to electric Vehicle*, KN: *Knowledge*, PBC: *Perceived Behavioral Control*, SN: *Subjective Norm*, VP: *Vehicle Performance*

Internal Consistency Reliability

Most often used, Composite Reliability, Joreskog (1971) assesses internal consistency reliability. In general, higher values indicate higher trust. For example, reliability values between 0.60 and 0.70 are considered "acceptable for exploratory research," and values between 0.70 and 0.90 range from "adequate" to "good." Cronbach Alpha is another measure of internal consistency confidence that uses the same threshold but returns a lower value than Composite Reliability. The results of the internal consistency reliability test are presented in Table 4.

Table 4. Internal consistency reliability

No	Variabel	Item	Alpha	CR
1	Environmental Concern	EC1, EC2, EC3, EC4, EC5	0,797	0,851
2	Knowledge	KN1, KN2, KN3	0,814	0,889
3	Charging Facilities	CF1, CF2, CF3	0,844	0,904
4	Vehicle Performance	VP1, VP2, VP3, VP4, VP5, VP6, VP7, VP8, VP9	0,933	0,944
5	Attitude	AT1, AT2, AT3, AT4	0,900	0,930
6	Subjective Norm	SN1, SN2, SN3	0,880	0,926
7	Perceived Behavioral Control	PBC1, PBC2, PBC3	0,806	0,885
8	Green Purchase Intention to electric Vehicle	GPIEV1, GPIEV2, GPIEV3, GPIEV4	0,873	0,914

Structural Model Testing (Inner Model)

Analysis using PLS was carried out through two stages: the measurement model and the structural model. Structural model testing tests the effect of latent variables on other latent variables in the research model. This study also reveals the R^2 for the structural path's coefficient of determination, as in Table 5.

Table 5. R-Square Value

Variabel	R-Square	R Square adj.
Attitude	0,497	0,491
GPIEV	0,614	0,604
PBC	0,347	0,341
Subjective Norm	0,235	0,232

Table 5 reveals that the R-Square value for the attitude variable is 0.497, which means the attitude variable is explained by environmental concern, charging facilities, and knowledge with a percentage of 49.7% which means it is included in the medium category and the perceived behavioral control variable explained by environmental concern and vehicle performance of 0.347 with a percentage of 34.7%, which means it is in the medium category. The R-Square

value on the subjective norm variable explained by environmental concern is 0.235 or 23.5%, which means it is included in the weak category. The R-Square value on the green purchase intention to electric vehicle variable, explained by environmental concern, attitude, subjective norm, perceived behavioral control, charging facilities, and knowledge, is 0.614 or 61.4%, included in the medium category.

Structural Model Test

The results of the structural equation modeling in Figure 3 and Table 6 show that there were 12 hypotheses proposed, nine hypotheses accepted, and three hypotheses rejected.

Table 6. Path Analysis

| No	H	Hypotheses	Path	*t*-value	*p*-value	Result
1	H1	Environmental Concern ((**EC**) → Attitude (**AT**)	0,381	5,950	0,000	Accepted
2	H2	Environmental Concern (**EC**)→ Subjective Norm (**SN**)	0,485	9,587	0,000	Accepted
3	H3	Environmental Concern (**EC**)→ Perceived Behavioral Control (**PBC**)	0,423	7,681	0,000	Accepted
4	H4	Environmental Concern (**EC**) → Green Purchase Intention to Electric Vehicle (**GPIEV**)	-0,028	0,516	0,606	Rejected
5	H5	Attitude (**AT**) → Green Purchase Intention to Electric Vehicle (**GPIEV**)	0,311	4,124	0,000	Accepted
6	H6	Subjective Norm (**SN**) → Green Purchase Intention to Electric Vehicle (**GPIEV**)	0,289	4,379	0,000	Accepted
7	H7	Perceived Behavioral Control (**PBC**) → Green Purchase Intention to Electric Vehicle (**GPIEV**)	0,070	0,908	0,364	Rejected
8	H8	Charging Facilities→ Attitude (**AT**)	0,207	3,672	0,000	Accepted
9	H9	Charging Facilities→ Green Purchase Intention to Electric Vehicle (**GPIEV**)	0,088	1,379	0,169	Rejected
10	H10	Vehicle Performance→ Perceived Behavioral Control (**PBC**)	0,267	4,296	0,000	Accepted
11	H11	Knowledge (**KN**) → Attitude (**AT**)	0,318	3,522	0,000	Accepted
12	H12	Knowledge (**KN**) → Green Purchase Intention to Electric Vehicle (**GPIEV**)	0,226	3,523	0,000	Accepted
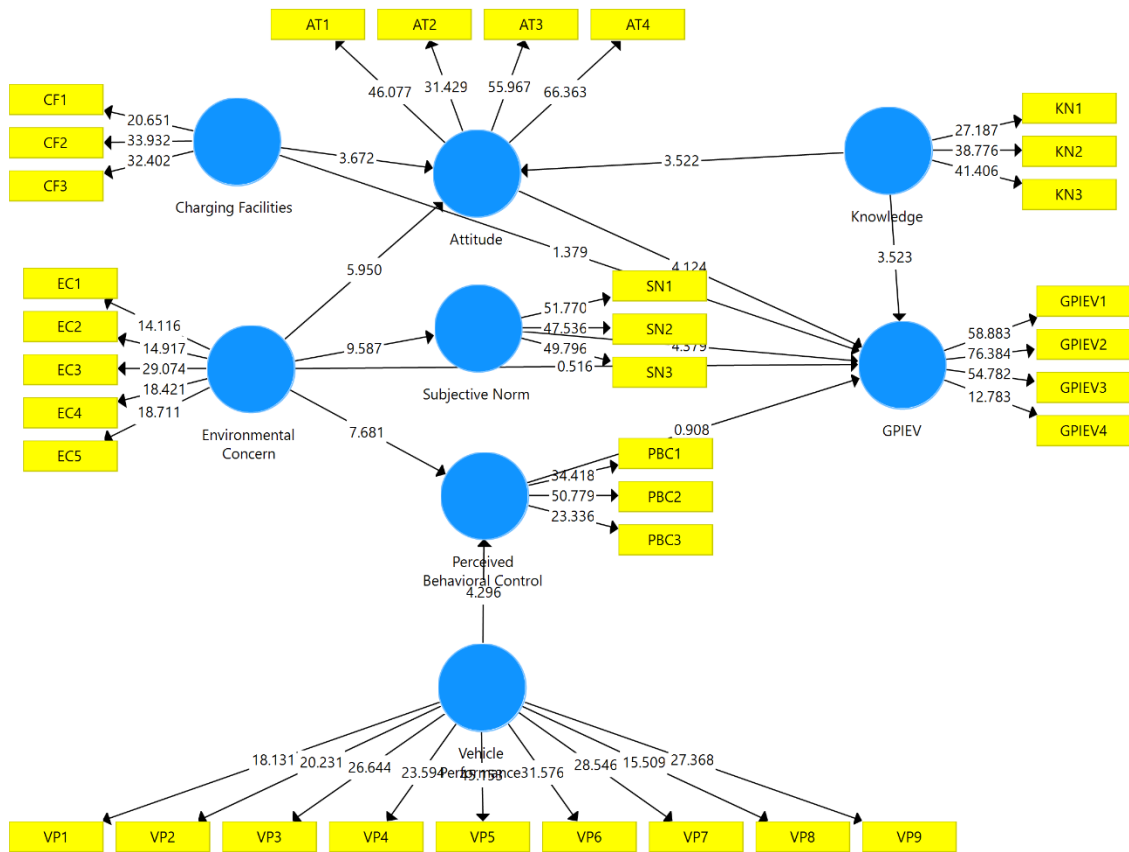
Figure 3. Structural Model

DISCUSSION

The results of the first hypothesis testing show that environmental concern has a significant effect on attitude. This result means that the better the level of concern of the respondents, which is manifested by changing their behaviour to reduce climate change and protect the environment by using electric vehicles that are more environmentally friendly, awareness of climate change will affect themselves and their families, as well as concern for environmental problems that increasingly serious in recent years can affect the attitude of respondents that electric vehicles will benefit the environment in the long term and can reduce the use of petroleum. The attitude of respondents will feel satisfied with themselves if they buy environmentally friendly electric vehicles and like the idea of having an environmentally friendly electric vehicle. The results of this study support Lai et al. (2015) environmental concern influences environmentally friendly attitudes. These results also align with Dutta & Hwang (2021) that environmental awareness positively and significantly affects consumer attitudes. The more consumers care about the environment, the more they want to buy products that are good for the environment. In other words, consumers of green products care about the environment, which positively impacts their attitudes. Consumers' concern for the environment forms a consumer's thought process to express their attitude towards the environment.

According to the findings of the second hypothesis test, environmental concern significantly influences subjective norms. According to the study's findings, the respondents' subjective norms were able to rise as a result of their environmental worries. When someone has a high environmental concern, it can influence their perception of social norms related to environmentally friendly actions. They may be more likely to view environmentally supportive actions as normative because they feel it is important to do so. This can motivate them to follow behaviour that is following these norms. In addition, environmental concerns can also influence a person's social interactions with other people who have similar views. When someone has friends or family who also care about the environment, they may feel positive pressure from their group to follow those norms. This may also strengthen the influence of "subjective norms" concerning environmental behaviour. The results of this study support the research of Dutta & Hwang (2021), which shows that social groups and references, especially peers and other people close to consumers, influence consumers' green purchasing decisions. When consumers face more pressure from family members to buy eco-friendly clothing, they may be more involved in buying eco-friendly clothing (Masur et al., 2021). Therefore, pressure from peer groups such as family or close friends can change consumer purchase intentions in favour of environmentally friendly electric cars.

According to the findings of the third hypothesis test, environmental concern significantly affects how one perceives one's ability to manage behavior. Environmental concerns can be important in shaping perceived behavioural control regarding electric vehicles. If someone cares a lot about the environment, they will likely be more inclined to consider an electric vehicle as a transportation option. First, environmental concerns can increase awareness of the importance of reducing carbon footprints. This may make individuals more open to the idea of switching to electric vehicles as a way to contribute to environmental protection. Furthermore, concerns about environmental impacts can motivate people to overcome perceived behavioural control factors, such as the price of electric vehicles. They may be more willing to look for solutions such as tax incentives or subsidy programs that make electric vehicles more affordable. Then, maintenance and repair of electric vehicles can also be easier or more affordable if someone believes their contribution to the environment is commensurate with the investment. This can strengthen their perceived behavioural control over these aspects. Finally, the ease of location to purchase an electric vehicle can also be important. If someone believes they can easily find and purchase an electric vehicle, this can increase their perceived behavioural control over the decision to switch. So, environmental concerns can be the main driver in shaping perceptions of behavioural control regarding the use of electric vehicles. The results of this study support Lai et al. (2015) that environmental awareness influences perceived behavioural control. The results of this study differ from Dutta & Hwang (2021), where someone with better behavioural control is more interested in buying ecological products, such as electric cars, than someone with poorer behavioural control.

The results of testing the fourth hypothesis show that environmental concerns do not directly affect the Green Purchase Intention for Electric Vehicles. The results of this study indicate that the environmental concerns of the respondents in this study cannot directly form the intention to buy electric vehicles. Individuals with environmental concerns about climate change and protecting the environment by using more environmentally friendly electric vehicles do not intend to buy electric vehicles. The results of this study are in contrast to previous research, which found that consumers who are environmentally sensitive and consider themselves environmentally friendly are more likely to choose electric cars (Lai et al., 2015). These results also do not match the findings, which explain that environmental concern is a unique belief. Caring for one's environment is an important personal belief. Therefore, environmental protection or consumer trust is a factor that might influence their decision to use environmentally friendly green products (Aguilar-Luzon et al., 2020). This result follows the findings according to Solekah et al. (2022), who found that environmental concerns do not directly affect the desire to reduce plastic waste. This can confirm that respondents in Indonesia who have good environmental awareness do not necessarily influence their environmentally friendly behaviour. These results also confirm the findings of a meta-analysis test of the relationship between environmental awareness and green behaviour in low green behaviour. The results show that environmental concern does not affect consumer behaviour Hartmann et al., (2017). This is due to previous findings that environmental concern does not directly affect certain pro-environmental behaviour patterns but indirectly affects them (Botetzagias et al., 2015; Groot & Steg, 2007).

Based on the testing results, the fifth hypothesis shows that attitude significantly affects Green Purchase Intention for Electric Vehicles. The results of this study indicate that respondents' beliefs about their behaviour towards electric vehicles that are more environmentally friendly and their consequences and provide benefits for the environment in the long-term influence consumer intentions to buy electric vehicles. The results of this study support several previous studies which show a positive correlation between consumer attitudes and their intention to adopt new technologies, particularly electric vehicles (Yurdakul & Kazan, 2020; Zhang et al., 2018).

Based on the testing results, the sixth hypothesis shows that subjective norms significantly affect the Green Purchase Intention for Electric Vehicles. Respondents' perceptions in this study of the expectations of influential people in their lives to adopt electric vehicles rather than conventional vehicles that use fuel influence the respondents' intention to buy electric vehicles. The results of this study support Dutta & Hwang (2021), and the research results by Lizin et al. (2017) subjective norms positively influence behavioural intentions. Chiou (1998) investigated that subjective norms positively influence behavioural intentions. However, they further explained that people who believe they will achieve certain behaviours are more likely to do so due to higher social pressure (Papaoikonomou et al., 2020; Groot & Steg, 2007).

The results of the seventh hypothesis' testing indicate that perceived behavioral control has no appreciable impact on the intention to buy green electric

vehicles Perceived behavioural control is proxied by the importance of the price of electric vehicles for respondents and the ability to buy them when they decide to adopt them, the importance of maintenance and repair of electric vehicles for respondents when they decide to adopt them, being able to find a place to buy electric vehicles if the respondents want, does not affect the intention of wanting respondents to adopt or use electric vehicles.

The results of this study contradict Shi et al. (2016), who found that the more consumers can control these elements, the more behavioural intentions are developed. This means that elements such as the price of electric vehicles, maintenance and repair of electricity, and the availability of places to sell electric vehicles do not affect the intention to buy an electric vehicle compared to conventional fuel-fueled vehicles. The results of this study also do not support Wang & Yan (2016), who also found a positive relationship between perceived behavioural control and purchase intention when consuming environmentally friendly electric vehicles.

Based on the testing results, the eighth hypothesis shows that charging facilities significantly affect attitude. The results of this study indicate that charging facilities are proxied by the accessibility of charging services, the ease of charging electric vehicle batteries, and fast charging times affect the attitude of respondents in this study in terms of electric vehicles will be beneficial to the environment in the long term and can reduce the use of petroleum, feel satisfied with themselves if they buy an eco-friendly electric vehicle, like the idea of having an eco-friendly electric vehicle. The results of this study support Dutta & Hwang (2021), who found that the availability of electric vehicle battery charging facilities affected attitudes.

The results of testing the ninth hypothesis show that charging facilities have no significant effect on the Green Purchase Intention for Electric Vehicles. These results show that charging facilities are proxied by the accessibility of charging services, the ease of charging electric vehicle batteries, and fast charging times do not affect respondents' interest in buying electric vehicles. The availability of charging options is an important factor that reduces consumer concerns about the range of electric vehicles. Even though the Indonesian government has installed battery installations in strategic locations to encourage consumer adoption of electric vehicles, respondents felt more was needed to increase their interest in buying electric vehicles. Likewise, even though the government's positive planning support, several charging stations have been installed in the best locations, which shows that the government takes care of the main concern of consumers and provides various user assistance, this has not been able to increase the interest of respondents to buy electric vehicles. This is because battery charging stations are considered lacking compared to oil refuelling stations, which are easy to fulfil at every point. The results of this study are in contrast to Sovacool et al. (2019), who found that charging facilities affected the desire of people to adopt electric vehicles.

Based on the results of testing, the tenth hypothesis shows that vehicle performance is formed from the considerations of respondents when buying an

electric vehicle based on the performance of mileage, speed and steering acceleration, battery life, design size and comfort, ease of operation, safety, technological reliability, financial savings, environmental attributes. Avoiding air pollution and emissions significantly affects respondents' perceived behavioural control as a stimulus or obstacle perceived by respondents in this study to show their behaviour. The results of this study support the research of Dutta & Hwang, 2021), who found that vehicle performance affects perceived behaviour control. The results of this study indicate that vehicle performance, such as safety, reliability, and driving range, affect Indonesian consumers' perceptions of behavioural control. This shows that vehicle efficiency is a major concern influencing the behaviour of Indonesian consumers towards purchasing considerations. Indonesian consumers tend to prioritize safety, reliability and mileage when purchasing green electric vehicles. This study found that vehicle performance, particularly driving distance and safety, is an important contributor, in line with previous studies (Chiou, 1998; Jiang et al., 2021).

Based on the results of testing the eleventh hypothesis, it shows that knowledge has a significant effect on attitude. The results of this study indicate that the respondents in this study had good information about the advantages of using electric vehicles, knowledge of government policies regarding electric vehicles, and information about electric vehicles having better quality compared to conventional vehicles affecting the attitudes of respondents who arose because of beliefs about behaviour their environmental friendliness and the consequences they will receive from that attitude. The results of this study support the research by Solekah et al. (2022). People's attitudes toward living in harmony with the environment will increase when they have complete understanding of the environment, in this case, thanks to more ecologically friendly electric vehicles. Additionally, as they are well aware of the long-term effects associated with environmental sustainability, information on environmentally friendly items will change their perspective on the idea of owning an environmentally friendly electric vehicle.

The results of testing the twelfth hypothesis show that knowledge significantly affects the Green Purchase Intention for Electric Vehicles. Knowledge of respondents in this study which is the information they have about environmental problems and their ability to understand and evaluate their impact on society and the environment and is proxied by knowledge of the advantages of using electric vehicles, knowledge of government policies regarding electric vehicles, and knowledge of electric vehicles that are more environmentally friendly Compared to conventional vehicles, it affects the desire or intention of respondents in this study to buy electric vehicles that are more environmentally friendly. These results are to the previous study of Rezvani et al. (2015), who have shown that knowledge is an important predictor of readiness to adopt EVs. It is important to note that despite the growing interest in electric vehicles, there may still be barriers to widespread adoption, including limited charging infrastructure, driving range, and availability of affordable EV models. However, as technology improves and more infrastructure is developed, the intention to buy eco-friendly electric vehicles is expected to increase.

CONCLUTION & FURTHER STUDY

It is important to note that despite the growing interest in electric vehicles, there may still be barriers to widespread adoption, including limited charging infrastructure, driving range, and availability of affordable EV models. However, as technology improves and more infrastructure is developed, the intention to buy eco-friendly electric vehicles is expected to increase.

This study uses (Dutta & Hwang, 2021; Sovacool et al., 2019) as a reference model. Researchers developed to investigate the green purchase intention of electric vehicles by using TPB as the basis for a conceptual framework by adding that it is influenced by individual factors (such as environmental concerns and knowledge) and situational factors (charging facilities and vehicle performance). The researchers of this study discovered that attitude had the most overall impact on green purchase intention for electric vehicles. Researchers can conclude that concern and knowledge of the environment will be the main components to generating good attitudes towards electric vehicles and purchase intentions because they play a major role in predicting attitudes. In this study, perceived behavioural control influences environmental awareness and vehicle performance, but PBC cannot directly influence GPIEV. Likewise, charging facilities do not affect environmentally friendly purchase intentions for electric vehicles. Significant contributions to the existing literature or theory, this research prove the Theory of Reasoned Action (TRA), which is the determining factor for GPIEV attitude toward behaviour and subjective norms.

The present study's findings make multiple contributions to theory and practice. First, it is generally accepted that pro-social or pro-environmental motivations are what drive a person's actions that support the environment. While the managerial implication is to improve GPIEV, companies should prepare regarding maintenance and spare parts for electric vehicles. The price of electric vehicles is also a concern, considering that electric vehicles, especially cars, are priced far above oil-fueled vehicles.

The findings in this study implicate that the interest of the Indonesian people to buy electric vehicles is shaped directly by their attitude in the form of beliefs about certain behaviours and their consequences, subjective norms which are a form of their perception of the expectations of influential people in their lives (significant others) regarding doing or not doing certain behaviours, knowledge or knowledge of information possessed by individuals regarding environmental problems and their ability to understand and evaluate their impact on society and the environment and vehicle performance or electric vehicle performance such as mileage, steering speed and acceleration, battery life, design, size and convenience, ease of operation, safety, technological reliability, financial savings, environmental attributes.

However, individual environmental concern for environmental problems, individual emotional evaluation of environmental problems, and willingness to support efforts to solve environmental problems perceived behavioural control in the form of encouragement or obstacles perceived by someone to show

behaviour and charging facilities, which are facilities or infrastructure or equipment or tools provided by stakeholders that can be used for the common good to charge electric vehicle batteries are not able to directly shape the interest of the Indonesian people to buy electric vehicles. This is due to previous findings that environmental concern does not directly affect certain pro-environmental behaviour patterns but indirectly affects them.

ACKNOWLEDGMENT

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Appendix 1. Variables and measurement of constructs

Variable	Operational definition	Item	Loading	Scale
Environmental Concern (EC)	EC is an individual's concern for environmental problems, an individual's emotional evaluation of environmental problems, and a willingness to support efforts to solve these environmental problems (Felix et al., 2018)	I am concerned about environmental issues (EC1)	0.700	1-7 scale adapted from Lai *et al.*, (2015), Wang (2016).
		People should change their behaviour to reduce climate change and protect the environment. (EC2)	0.724	
		People should change their behaviour to reduce climate change and protect the environment by using electric vehicles, which are more environmentally friendly (EC3)	0.748	
		I think climate change is a threat to me and my family (EC4)	0.740	
		Environmental problems have become more and more serious in recent years (EC5)	0.739	
Charging Facilities (CF)	CK is defined as facilities or infrastructure or equipment or tools provided by stakeholders that can be used for common interests in the process of turning used materials into new materials to prevent waste that can become something useful, reducing the use of new raw materials (KLH 2020, Wikipedia 2022)	Accessibility of charging services (1 Very not very easy-7 Very easy) (CF1)	0.843	1-7 scale adapted Sovacool *et al.*, (2019)
		Ease of charging electric vehicle batteries (1 Very not very easy-7 Very easy) (CF2)	0.896	
		Fast charging time (1 Not very fast-7 Very fast) (CF3)	0.871	

Variable	Operational definition	Item	Loading	Scale
Knowledge (KN)	Knowledge is the amount of information individuals have about environmental problems and their ability to understand and evaluate their impact on society and the environment (Chekima et al., 2016)	I know the advantages of using electric vehicles (KN1)	0.859	1-7 scale derived from Sovacool *et al.,* (2019)
		I am aware of the government's policy on electric vehicles (KN2)	0.857	
		Electric vehicles are more environmentally friendly than conventional vehicles (KN3)	0.844	
Attitude (AT)	AT is Beliefs about particular actions and their consequences (Ajzen, 1991)	Electric vehicles will benefit the environment in the long term. (AT1)	0.873	1-7 scale Adapted Afroz *et al.,* (2015) Barbarossa *et al.,* (2015)
		Electric vehicles can reduce the use of petroleum (AT2)	0.842	
		I will feel satisfied with myself if I buy an environmentally friendly electric vehicle (AT3)	0.889	
		I like the idea of having an eco-friendly electric vehicle (AT4)	0.904	
Subjective Norm (SN)	Individual perceptions of the expectations of influential people in their lives (significant others) about whether or not certain behaviors are performed (Ajzen, 1991)	Most people who are important to me think I should adopt an electric vehicle when adopting one shortly (SN1)	0.891	1-7 scale Adapted Wang *et al.,* (2016), Han & Yoon, (2015), Afroz *et al.,* (2015)
		If I buy an electric vehicle, most people who are important to me will also buy one (SN2)	0.898	
		Most people who are important to me want me to use eco-friendly electric vehicles instead of conventional vehicles that run on fuel (SN3)	0.905	
Perceived Behavioral Control (PBC)	Perceived behavioral control is encouragement or resistance perceived by someone to show behavior (Ajzen, 1991)	The price of an electric vehicle is important to me, and I can afford it when I decide to adopt one (PBC1)	0.865	1-7 scale Adapted Han & Yoon, (2015)
		Electric vehicle maintenance and repair were important to me when I decided to adopt one (PBC2)	0.872	
		I can find a place to buy an electric vehicle if I want (PBC3)	0.808	
Vehicle Performance (VP)	Electric vehicle performance, such as mileage, steering speed, and	That is my consideration when buying an electric vehicle: Mileage (VP1)	0.778	1-7 scale Adapted Sovacool et al., (2019)

Variable	Operational definition	Item	Loading	Scale
	acceleration, battery life, design, size and comfort, ease of operation, safety, technological reliability, financial savings, and environmental attributes Sovacool et al., (2019)	Steering speed and acceleration (VP2)	0.788	
		Battery life (VP3)	0.827	
		Design, size and comfort (VP4)	0.810	
		Ease of operation (VP5)	0.864	
		Safety (VP6)	0.865	
		Technology reliability (VP7)	0.834	
		Financial savings (cheaper to drive) (VP8)	0.725	
		Environmental attributes (avoiding air pollution and GHG emissions) (VP9)	0.762	
Green Purchase Intention to electric Vehicle (GPIEV)	Green purchase intention is the desire of consumers to choose green products (electric vehicles) and the intention to buy green products (electric vehicles) (Chen & Chang, 2012, Indirani et al., 2019)	I have every intention of driving an electric vehicle soon (GPIEV1)	0.899	1-7 scale Adapted Afroz *et al.,* (2015) Barbarossa *et al.,* (2015)
		I will consider buying an eco-friendly electric vehicle (GPIEV2)	0.916	
		I would recommend using electric vehicles to others (GPIEV3)	0.890	
		I will buy an electric vehicle if it is of higher quality than conventional vehicles (GPIEV4)	0.691	