Sibatik Journal
Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, dan Pendidikan
E-ISSN: 2809-8544

THE ROLE OF NEW ENVIRONMENTAL PARADIGM IN SWITCHING INTENTION TO ELECTRIC VEHICLES: A VALUE BELIEF NORM PERSPECTIVE

Donna Panjaitan[1]*, Evi[2]
Binus University, Indonesia
***Email Correspondence:** donna.panjaitan@binus.ac.id

Abstract

This research arises from the rapid introduction of electric vehicles (EVs) in response to sustainability concerns. Many studies have analyzed the switching intention mechanism from the utilitarian perspective. However, fewer studies address EV adoption from a psychological standpoint. Using the Value Belief Norm framework, this study investigates the psychological values influencing an individual's intention to switch from conventional to electric vehicles driven by their norms. This research uses a quantitative approach, using a survey method. Using convenience sampling, we gathered 294 usable responses. Data was analyzed using the Partial Least Squares Structural Equation Model (PLS-SEM). The results show that individuals with a New Environmental Paradigm (NEP) will be more aware of environmental problems. NEP, as a customer value, drives individuals' belief that there is an ecological problem. NEP also drives self-efficacy in understanding environmental issues. Data support that problem awareness and self-efficacy will form personal norms that, in turn, will create the intention to switch to electric vehicles. This research provides theoretical implications by highlighting individuals' switching intentions to use electric vehicles, reflecting social transformation and commitment to sustainable practices. The value-belief-norm (VBN) Theory suggests that individual, exceptionally altruistic values play a significant role in pro-environmental behaviors such as using electric vehicles.

Keywords: *Electrical Vehicle, Environment, Intention, Norm activation model, personal norm*

INTRODUCTION

Electric Vehicles (EVs) are considered a promising sustainable alternative compared to Internal Combustion Engine Vehicles (ICEVs), as they have advantages such as better fuel efficiency and lower carbon emissions (Krishnan & Koshy, 2021). EVs are vehicles that use the energy stored in them for propulsion and have the potential for zero emissions when electricity is generated from renewable resources. With efforts to reduce air emissions and as a form of environmental protection, Electric Vehicles continue to develop and are in great demand in various countries, including Indonesia. This is evidenced by the increase in the use of electric motors, which increased 13 times between 2020 and 2022. The use of electric motors, initially 1947 units, increased dramatically to 25782 units at the end of 2022 (Databoks, 2023). While adopting electric vehicles in developing countries, such as Indonesia, faces many challenges, electric cars also present significant opportunities for sustainable transportation and economic development. These challenges also occur in areas with the most EV users, with Jakarta and Bandung being the highest EV-using provinces (Zulfikar, 2023).

As such, it also coincides with the energy dilemma and worsening environmental pollution. This is evidenced by the fact that Jakarta is listed as one of the top 10 cities with the worst air quality in the world (CNBC, 2023). Therefore, electric-powered vehicles have become one option that has received much attention due to their lower greenhouse gas

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

emissions and oil consumption in Jakarta. This study examines the factors influencing individuals' intention to switch from conventional to electric vehicles amidst the activation of norms in the Jakarta environment and its surroundings.

Value Belief Norm theory is a framework used as a predictive tool for a person's behavior/intention to buy products such as electric vehicles (Zhang et al., 2020). This theory states that values, beliefs, and social norms are essential in shaping individual attitudes and environmental behavior among the general public (Whitley et al., 2018). In the context of electric vehicles, sustainability values, environmental awareness, and the desire to contribute to reducing carbon footprint may determine the intention to switch to EVs. Although electric cars are emerging as an environmentally friendly alternative, little is known about these high-involvement purchase decisions and the psychological factors behind the adoption intention of Electric vehicle technology (Nordlund et al., 2016). In terms of user psychology, electric vehicle (EV) users often experience a transformation of their norms along with adopting this green technology. They not only become drivers but also pioneers of change towards sustainable mobility. Their norms involve an awareness of environmental impacts and a desire to reduce their carbon footprint.

Empirically, Srivastava et al. (2023) also state that personal norms significantly affect consumer decisions to rent EV units. Research conducted by Srivastava et al. (2023) explains the influence of personal norms and describes one's behavior in protecting the environment in the customer's intention to rent an electric vehicle. It does not explain how customers will use their views on the environment when renting electric cars. Researchers who reveal the influence of environmental views on the use of electric vehicles are Nordlund et al. (2016). This study explains how NEP can influence customers' desire to use electric/hybrid cars. VBN theory Stern et al. in Nordlund (Nordlund et al., 2016) built a norm and value activation theory. They linked it to the New Environmental Paradigm (NEP), inspiring researchers to use VBN theory. Unfortunately, the scope of Nordlund's (2016) research was conducted in Sweden. Hence, it remains to be confirmed whether it is relevant to Indonesia, especially Jakarta, given the different societies compared to Sweden regarding habits, mindset, and culture. Jakarta is one of the world's most polluted cities, so changes must be made to reduce carbon emissions. Therefore, this research uses the value belief norm theory to examine the psychological factors and the new environmental paradigm (NEP) influencing consumer intentions to replace conventional vehicles with electric vehicles in Jakarta.

This research is essential as electric vehicles (EVs) are gaining popularity in Indonesia, with adoption increasing significantly. However, there is still a need for a deeper understanding of the psychological factors that influence individuals' intention to switch to EVs amidst severe environmental challenges in Jakarta, one of the most polluted cities in the world. This is a campaign strategy for companies to attract consumers who care about the environment to change their vehicles from conventional fossil-fueled vehicles to more environmentally friendly electric ones. So, this research aims to identify the psychological factors influencing the intention to adopt electric vehicles in Jakarta.

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

LITERATURE REVIEW

Switch of Intention to Electrical Vehicle in Jakarta

Electric Vehicles (EVs) have been recognized in numerous literature and studies as the primary choice for future transportation (Jing et al., 2016). Electric Vehicles (EVs) are considered a solution to the high dependence on fossil fuels and the increasing level of pollution (Zhao et al., 2018). The transition to using EVs is employed to reduce carbon emissions in Indonesia (Sudjoko et al., 2021). The implementation of EVs in economy, transportation, and mobility is crucial as it is one of the backbones of national economic progress, with a highly significant economic multiplier effect (Sudjoko et al., 2021). This is because the transportation industry is supported by many suppliers developing various components and sub-assemblies for vehicle systems (Novizayanti et al., 2021).

In recent years, Jakarta has witnessed a significant shift in the individual and business intentions to use Electric Vehicles (EVs) (Gunawan et al., 2022). This transformation reflects an increasing awareness of the environmental impact of traditional fuel-powered vehicles and a collective commitment to sustainable practices. This shift aligns with global efforts to reduce carbon emissions and positions Jakarta as a forward-thinking and environmentally conscious metropolitan city, ready to pave the way for a cleaner and more sustainable future in urban transportation. With the continuous development of charging infrastructure and advancements in electric vehicle technology, Jakarta is poised to emerge as a leading city in Southeast Asia, prioritizing environmentally friendly transportation modes.

Value Belief Norm (VBN)

Stern et al. first introduced the value-belief-norm (VBN) theory to explain the influence of human values on behavior in environmental contexts (Karimi, 2019). This theory states that value orientations can directly influence pro-environmental behavior, including using EVs (Chen et al., 2015). Value orientations are a principle that can guide an individual and influence pro-environmental behavior (Tamar et al., 2020).

Studies employing the VBN theory indicate that altruistic value orientations are related to pro-environmental behavior but can be influenced by values associated with the environment (Karimi, 2019). Although the VBN theory has been used to explain the influence of behavioral values in environmental contexts, there is still limited research utilizing the VBN theory in measuring consumer intentions to behave environmentally friendly (Saleem et al., 2021). The VBN theory proposes a hierarchical causal sequence from values, beliefs (NEP or issue awareness), and Personal Norms to intentions/behavior (Nordlund et al., 2016). Additionally, Majeed et al. (2023) revealed that self-efficacy toward Personal Norms is part of the VBN framework. Furthermore, Ateş (2020) stated that the VBN theory suggests that personal norms support pro-environmental behavior. However, applying the VBN theory in measuring consumer intentions to behave environmentally friendly still requires further research.

The New Environmental Paradigm (NEP) is a belief-based and value-oriented predictor of consumers' intention to behave pro-environmentally, having pro-environmental effects across different behavioral levels (Manoli et al., 2019). One theoretical approach to

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

studying environmental attitudes proposes that ecological attitudes are formed by considering critical aspects of some attitude object and the importance of the object's relevance to values. The meaning contained in this statement, according to I Wayan et al. (2019), is a person's value orientation in the environment based on a value system that is (1) selfish, refers to the tendency of value orientation related to personal gain, 2) altruistic: concern for the interests of others and the environment, and; 3) biospheric emphasizes connectedness and existence in the natural environment of the universe. On the other hand, in a development conducted by Ntanos et al. (2019), NEP is divided into five dimensions: limiting variables of growth, anti-anthropocentrism, vulnerability of natural balancing, rejection of exemptionalism, as well as the instances of an eco-crisis episode.

Relationship between Variables

Research by Han et al. (2018) and Nordlund et al. (Nordlund et al., 2016) revealed that NEP positively influences awareness. Apart from its impact on the problem of awareness, Park et al. (2018) indicated that NEP is also considered an essential element in controlling behavior, including self-efficacy. Nordlund (2016) empirically showed that NEP positively and significantly affects Self Efficacy. Thus, it can be concluded that NEP plays an essential role in the awareness and self-efficacy problem in using EV vehicles.

Based on this discussion, we hypothesize:

1. H1: New Environmental Paradigm (NEP) has a positive and significant effect on the Problem Awareness;
2. H2: New Environmental Paradigm (NEP) Has a Positive and Significant Effect on Self Efficacy.

Awareness of consequences, referred to as the Problem of Awareness (PoA), refers to an individual's belief and understanding of specific circumstances that threaten other individuals or objects valued by that individual (Sandhu et al., 2019). Sandhu (2019) also revealed that the problem of awareness is considered a form of individual understanding of specific circumstances that threaten other individuals or objects valued by the individual. Individuals must be aware of the adverse effects of their behavior on the environment before feeling responsible for acting pro-environmentally (Onwezen et al., 2013). Zhang in He & Zhan (2018) highlighted that when people realize that excessive energy consumption, in addition to excessive energy use, is causing ecological damage and global warming, they feel a shared responsibility for these consequences. He & Zhan (2018) added that the stronger the awareness of the problems associated with car use, the more they feel responsible for these consequences. The measurement scale of problem awareness, as conducted by He & Zhang (2018), is on a 7-point Likert scale. Similarly, if consumers are unaware of the adverse effects of using conventional vehicles, it is difficult for them to feel a shared responsibility for the negative consequences.

Conversely, consumers will feel responsible if they know the adverse effects. According to Iriyadi et al. (2019), problem awareness affects the personal norm for individual behavior towards the environment. In addition, Iriyadi et al. (2019) revealed that in the context of pro-environmental behavior, awareness of consequences is a personal norm

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

towards the environment that allows a person to realize the implications of their behavior on the environment. Therefore, problem awareness positively affects personal norms in VBN theory.

Based on this discussion, we hypothesize we hypothesize that:

H3: Problem Awareness has a positive and significant effect on personal norms.

Self-efficacy refers to a person's belief in their ability to perform particular actions (Garaika et al., 2019). Self-efficacy began with Albert Bandura's concept (in Kondratowicz (Kondratowicz et al., 2022)) as a form of variation in individual behavior caused by changes that occur in the environment. It is assumed that beliefs in self-efficacy influence individual adaptation and the changes it makes. In line with Burnham & Ma's (2017) approach, self-efficacy means how individuals assess their ability to cope with specific situations.

Moreover, it relates to an individual's beliefs about having the ability to perform specific actions necessary to achieve concrete outcomes, as well as to engage in problem-solving behaviors and strategies that help cope with life changes (Glazer & Liu, 2017; Kondratowicz et al., 2022). In the context of electric vehicle (EV) use, self-efficacy can contribute to forming personal norms for using environmentally friendly cars Nordlund et al. (2016). Nordlund et al. (2016) also added that self-efficacy is considered as a person's ability to believe that there is a contribution, even if it is small, in reducing the negative impact of the environment by using Electric vehicles and belief that the choices made will influence the car industry in a pro-environmental direction. The measurement scale is based on Yavuzalp & Bahcivan Yavuzalp & Bahçivan (2020) with a 5-category Likert scale.

Therefore, self-efficacy has the potential to have a positive influence on personal norms. This is proven by Nordlund et al. (2016), which showed a positive significant effect of self-efficacy on personal norms when using EV vehicles. However, there is still no more research confirming the study results other than Nordlund et al. (2016), where there is strong evidence of the positive influence of self-efficacy in specific contexts; its relationship with personal norms in the context of EV vehicles requires further research.

Based on this discussion, we hypothesize that:

H4: Self-Efficacy Has a Positive and Significant Effect on Personal Norms.

Research by Asadi et al. (2021) and Nordlund et al. (2016) shows that personal norm has a positive effect on a person's intention to replace a conventional vehicle with an electric vehicle (EV) or buy a new EV. According to Lind et al. (2015), a personal norm is an internal rule that regulates a person's behavior based on moral beliefs or personal values. According to Sandhu et al. (2019), researching personal norms consisting of 5 question items can be operationalized from 3 dimensions: ethical beliefs, individual standards, and moral obligations. The measurement scale is Likert 5 categories: (1) Strongly Disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly Agree.

The personal norm appears in the statement that individuals are morally obligated to use sustainable transportation rather than vehicles, even when buying a new vehicle. This moral obligation is extended in the belief that individuals should do everything they can to

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

reduce vehicle use, reflecting a believed personal norm (Keizer et al., 2019; Ünal et al., 2019; Zhang et al., 2020). Furthermore, the obligation to pay attention to the environment in daily behavior becomes a concrete manifestation of the personal norm. Thus, personal norms can influence a person's intention to switch to an electric vehicle. Understanding the influence of personal norms can help design communication strategies and policies to increase the adoption of electric vehicles in society. According to Hu et al. (2023), the intention to replace electric cars includes replacing conventional vehicles with electric vehicles, having a high probability of replacing electric vehicles, deciding to replace electric vehicles, and considering choosing electric vehicles as daily vehicles. In addition, Hu et al. (2023) used a 7-category Likert measurement scale. Thus, an approach that strengthens environmental values and awareness of positive ecological impacts is expected to encourage individual intentions to replace conventional vehicles with electric vehicles, thereby contributing to climate change mitigation efforts.

Based on this discussion, we hypothesize we hypothesize:

H5: Personal Norm has a positive and significant effect on the intention to switch EVs.

Theoretical framework

Based on the hypothetical structure formed, the theoretical framework is as follows.

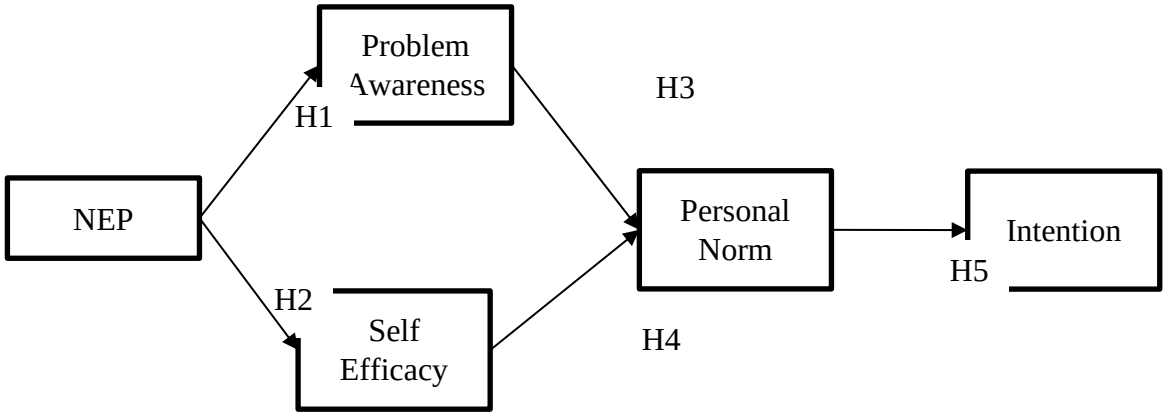

Figure 1. Theoretical Framework

METHOD

Research Design Elements

The scenario of this study is to determine and strengthen individual behavior-based knowledge related to the intention to switch to electric vehicles by analyzing the correlation between problem awareness, efficacy, and new environmental paradigm factors that correlate with personal norms. Quantitative methods can be applied in this study because these methods have been implemented in previous studies that focus on predicting correlations between variables, such as research conducted by Nordlund (2016), He & Zhang (2018), Yavuzalp & Bahcivan (2020); Sandhu et al., (2019); and Hu et al. (2023). Quantitative research design can be applied because this method focuses on collecting and

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

evaluating numerical data from a set of quantitative survey data, allowing researchers to reach several respondents quickly and more effectively than qualitative studies with the same sample size. Regarding the focus/component studied, the unit of analysis is individuals residing in Jakarta, both women and men, who use internal combustion engine vehicles.

Sampling Method/Procedure and Sample Size

This study's selected data source or population is Jakarta's conventional internal combustion engine vehicle users. The parameters to be examined in this research are the intention to switch from the target population triggered by the New Environmental Paradigm (NEP), which shapes problem awareness and self-efficacy, forming personal norms. Considering that the data source used as the population in this study is significant in number and area, it would require sufficient resources such as time, money, and effort if data were to be taken from the population. This research utilizes non-probability sampling due to the widespread nature of the target sample in Jakarta. Therefore, non-probability sampling techniques are considered suitable for theoretically generalizing the sample, as Zamil et al. (2023) stated.

Data Collection Techniques and Analysis

Data collection was carried out using primary data through a survey method. Since the target sample is scattered throughout Indonesia, electronic questionnaires can be used for data collection in this research. Additionally, the measurement of research variables for Problem Awareness was adapted from He & Zhang (2018), Self-Efficacy was adapted from Yavuzalp & Bahcivan (2020), New Environmental Paradigm (NEP) was adapted from Ntanos et al. (2019), Personal Norm was adapted from Sandhu et al. (2019), and Intention to Switch EV adapted from Hu et al. (2023). The survey questionnaire used consists of a basic explanation of the research objectives and assurance that the data provided by each respondent will be kept confidential. Measurements for this research were taken from questions that were ensured for reliability and validity in previous studies.

In identifying the influence of individuals in psychological factors, including the New Environmental Paradigm (NEP) that affects consumers' intentions to switch from conventional fuel-powered vehicles to electric vehicles in Jakarta, the researcher used the Value Belief Norm Theory and employed the Structural Equation Modeling Partial Least Squares (SEM PLS) data analysis method. SEM PLS can analyze complex models with many latent variables and indicators. This analysis was conducted because the research model appears complex (Figure 1). The data analysis technique of the Structural Equation Model Partial Least Squares (SEM-PLS) and the statistical program SmartPLS 3 were used to estimate the estimation model. The measurement model was tested by assessing instrument validity using the convergent validity of the average variance extracted (AVE) and discriminant validity of the Heterotrait-Monotrait ratio (HTMT). Convergent validity is indicated through outer loading and AVE, while construct reliability is indicated through Cronbach's alpha and composite reliability. It is acceptable if the outer loading exceeds 0.5 (Bahtiar et al., 2020). Hypothesis testing is identified by conducting a structural model in

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

SmartPLS after the measurement model is evaluated and the values meet the requirements. To determine how significant variables directly influence other variables, one must look at the path coefficient and evaluate interaction effects (t-value > t-table) to strengthen hypotheses. Hypotheses are accepted when the p-value < 0.05.

Table 1 depicts the demographic characteristics of the 294 respondents who participated in Table 1 depicts the demographic characteristics of the 294 respondents who participated in the survey. Regarding age, most respondents fall within the range of 21 to 30 years, reaching 49%, followed by the age group of 31 to 40 years at 31%. Respondents under 20 years old account for 3%, while those above 60 contribute only 0% of the total. Regarding gender, female participation dominates with 70%, while male respondents reach 30%. Regarding professions, private sector employees constitute the largest group with 48%, followed by homemakers at 15%. Other professions, such as civil servants, homemakers, educators, and healthcare professionals, each contribute smaller percentages. Overall, this table provides an overview of diversity in survey participation with a fairly even distribution across various demographic groups.

Table 1. Respondent Demographic from the Questionnaire

Demographics	**Number of Respondents**	**Percentage**
Age		
< 20 Years Old	8	3%
21 - 30 Years Old	143	49%
31 - 40 Years Old	91	31%
41 - 50 Years Old	41	14%
51 - 60 Years Old	10	3%
> 61 Years Old	1	0%
Gender		
Male	87	30%
Female	207	70%
Profession		
Student	37	13%
Private Employee	142	48%
State-Owned Enterprises /BUMN	4	1%
Civil Servant/ASN	11	4%
Housewife	43	15%
Educational Personnel	35	12%
Doctor/Healthcare Professional	10	3%
Others	12	4%
Grand Total	**294**	**100%**

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

RESULTS AND DISCUSSION

Measurement Model Assessment: Convergent Validity and Discriminant Validity

The measurement model is tested by evaluating outer loadings, composite reliability, Cronbach's alpha (α), discriminant validity, and average variance extracted (AVE) for convergent validity. Refusing to assess convergent validity may jeopardize research findings. Indicators of two different types should be used to evaluate the convergent and discriminant validity of the measurement model. Essential metrics for convergent validity involve outer loadings and AVE. AVE is used to assess the variance of the measurement model for each construct, and outer loadings are used to determine the reliability of indicators. The results of each assessment tool for convergent validity are presented in Table 2. The results presented in Table 2 indicate that, in addition to measurement items having outer loadings ≥ 0.5. Meanwhile, all items also state that the AVE values for all measurement items are≥ 0.5, indicating good convergent validity (Zamil et al., 2023).

Table 2. Measurement Items

Item Code	Measurement Items	Outer Loading	Cronbach's Alpha	CR	AVE
PoAl	Driving a conventional car causes fuel depletion.	0.799			
PoA2	Driving a conventional car contributes to environmental damage.	0.927	0.861	0.916	0.785
PoA3	Driving a conventional car has an effect on global warming.	0.926			
SE1	Although the contribution is small, it is important that I participate in efforts to reduce the negative impact on the environment.	0.733			
SE2	My choices as a consumer can influence the automotive industry towards a pro-environment direction electric vehicles.	0.857	0.842	0.894	0.679
SE3	I believe I can find creative solutions to overcome various	0.828			

Item Code	Measurement Items	Outer Loading	Cronbach's Alpha	CR	AVE
	obstacles in using electric vehicles.				
SE4	I believe I can adapt to the lifestyle changes required to use electric vehicles.	0.871			
NEP1	In my opinion, the human population is approaching the limit of the number of people that the Earth can sustain	0.639			
NEP2	In my opinion, humans have the right to alter the natural environment to suit their needs.	0.616			
NEP3	In my opinion, when humans intervene with nature, it offen results in very bad consequences.	0.7			
NEP4	In my opinion, human intelligence will ensure that we do not make the Earth uninhabitable.	0.612	0.909	0.923	0.502
NEP5	In my opinion, humans have greatly abused the environment.	0.704			
NEP6	In my opinion, the Earth has many natural resources if we only learn how to develop them.	0.742			
NEP7	In my opinion, plants and animals have the same right as humans to exist.	0.75			
NEP8	In my opinion, the balance of nature is strong enough to handle the impact of modern industrial countries.	0.662			

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

Item Code	Measurement Items	Outer Loading	Cronbach's Alpha	CR	AVE
NEP9	Despite having special abilities, humans still need to abide by the laws of nature.	0.75			
NEP13	The balance of nature is very sensitive and easily disturbed.	0.752			
NEP14	Ultimately, humans will learn enough about how nature works to be able to control it.	0.746			
NEP15	If things continue as thevare, we will soon experience a major ecological disaster.	0.799			
PN1	I feel obligated to buyan electric vehicle rather than a conventional vehicle.	0.853			
PN2	Using an electric vehicle instead of a conventional vehicle makes me feel like a better person.	0.918			
PN3	If I use an electric vehicle instead of a conventional vehicle, I feel as if I am making an individual contribution to something better.	0.899	0.897	0.926	0.716
PN4	I feel morally bound to buy environmentally friendly electric vehicle products, regardless of what others do.	0.887			
PN5	I feel guilty when I buy products that harm the environment	0.645			
I1	I will consider switching from a conventional	0.907	0.954	0.967	0.878

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

Item Code	Measurement Items	Outer Loading	Cronbach's Alpha	CR	AVE
	vehicle to an electric vehicle.				
I2	There is a high possibility of switching my vehicle to an electric vehicle.	0.955			
I3	I will make the decision to switch to an electric vehicle.	0.954			
I4	I prefer using an electric vehicle (EV) as my commuting vehicle.	0.932			
Item Code	Measurement Items	Outer Loading	**Cronbach's Alpha**	**CR**	**AVE**
PoAl	Driving a conventional car causes fuel depletion.	0.799			
PoA2	Driving a conventional car contributes to environmental damage.	0.927	0.861	0.916	0.785
PoA3	Driving a conventional car has an effect on global warming.	0.926			
SE1	Although the contribution is small, it is important that I participate in efforts to reduce the negative impact on the environment.	0.733			
SE2	My choices as a consumer can influence the automotive industry towards a pro-environment direction electric vehicles.	0.857	0.842	0.894	0.679
SE3	I believe I can find creative solutions to overcome various	0.828			

Item Code	Measurement Items	Outer Loading	Cronbach's Alpha	CR	AVE
	obstacles in using electric vehicles.				
SE4	I believe I can adapt to the lifestyle changes required to use electric vehicles.	0.871			
NEP1	In my opinion, the human population is approaching the limit of the number of people that the Earth can sustain	0.639			
NEP2	In my opinion, humans have the right to alter the natural environment to suit their needs.	0.616			
NEP3	In my opinion, when humans intervene with nature, it offen results in very bad consequences.	0.7			
NEP4	In my opinion, human intelligence will ensure that we do not make the Earth uninhabitable.	0.612	0.909	0.923	0.502
NEP5	In my opinion, humans have greatly abused the environment.	0.704			
NEP6	In my opinion, the Earth has many natural resources if we only learn how to develop them.	0.742			
NEP7	In my opinion, plants and animals have the same right as humans to exist.	0.75			
NEP8	In my opinion, the balance of nature is strong enough to handle the impact of modern industrial countries.	0.662			

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

Item Code	Measurement Items	Outer Loading	Cronbach's Alpha	CR	AVE
NEP9	Despite having special abilities, humans still need to abide by the laws of nature.	0.75			
NEP13	The balance of nature is very sensitive and easily disturbed.	0.752			
NEP14	Ultimately, humans will learn enough about how nature works to be able to control it.	0.746			
NEP15	If things continue as thevare, we will soon experience a major ecological disaster.	0.799			
PN1	I feel obligated to buyan electric vehicle rather than a conventional vehicle.	0.853			
PN2	Using an electric vehicle instead of a conventional vehicle makes me feel like a better person.	0.918			
PN3	If I use an electric vehicle instead of a conventional vehicle, I feel as if I am making an individual contribution to something better.	0.899	0.897	0.926	0.716
PN4	I feel morally bound to buy environmentally friendly electric vehicle products, regardless of what others do.	0.887			
PN5	I feel guilty when I buy products that harm the environment	0.645			
I1	I will consider switching from a conventional	0.907	0.954	0.967	0.878

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

Item Code	Measurement Items	Outer Loading	Cronbach's Alpha	CR	AVE
	vehicle to an electric vehicle.				
I2	There is a high possibility of switching my vehicle to an electric vehicle.	0.955			
I3	I will make the decision to switch to an electric vehicle.	0.954			
I4	I prefer using an electric vehicle (EV) as my commuting vehicle.	0.932			

Most measurement items demonstrated satisfactory outer loadings, except for NEP10, NEP11, and NEP10, which were deemed acceptable based on their AVE values exceeding 0.5, as shown in Table 2. To ensure the reliability of the measurement variables, the correlation of each construct is evaluated using Cronbach's alpha. Table 2 shows that Cronbach's alpha values for each variable are ≥ 0.7. Thus, it can be concluded that the measurements are in accordance with the reliability assessment (Yana et al., 2015). A formative measurement model was also conducted, showing VIF measurement values < 0.5, as if the measurements had no multicollinearity issues.

Statistical analysis of the heterotrait-monotrait ratio (HTMT) is used in this study as a method for discriminant measurement. These values should not exceed 0.9 to have good discriminant validity (Patwary et al., 2021); values higher than 0.9 have low discriminant validity. In the table, no values surpass the HTMT test of 0.9, as indicated in Table 3. Based on the results of convergent validity and discriminant validity assessments, it can be concluded that the measurement items are valid.

Table 3. Discriminant Validity: HTMT Statistics

Items	I	NEP	PN	PoA	SE
Intention	-				
NEP	0.643	-			
Personal Norms	0.875	0.622	-		
Problem of Awareness	0.578	0.68	0.535	-	
Self Eficacy	0.519	0.579	0.572	0.503	-

Assessment of Structural Model: Hypothesis Testing

After the measurement model is assessed and the values meet all criteria, hypothesis testing on the structural model is determined by performing bootstrapping in SmartPLS.

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

Researchers are required to use bootstrapping with a sample size of 5000 individuals and a significance level of 0.05. It is crucial to understand how the main variables affect other variables and examine the standard beta coefficients (standard beta). However, merely stating that there is a positive association does not necessarily mean the variables are highly connected. It is also essential to assess interaction effects (t-values) to support hypotheses. When the p-value is < 0.05, the t-value must be above 1.650053 (t-value > 1.650053) with N=294 for the hypothesis to be accepted. The results of the hypothesis testing are displayed in Table 4.

Table 4. Path Coefficient for Direct Effect

Hypotheses	Original Sample	Sample Mean	Standard Deliation	T Statistics	P Values
NEP -> Problem of Awareness	0.606	0.609	0.043	14.008	0
NEP -> SelfEffcacy	0.511	0.512	0.069	7.417	0
Personal Norm - > Intention	0.816	0.817	0.023	35.737	0
Problem of Awareness -> Personal Norm	0.312	0.305	0.062	5074	0
Sef Effcacy -> Personal Norm	0.368	0.375	0.063	5.841	0

The path coefficient results indicate that (H1 and H2) the New Environmental Paradigm (NEP) has a positive and significant effect on Problem Awareness (β=0.606) and Self-Efficacy (β=0.511) (H1: p-value = 0.000, t = 14.008; H2: p-value = 0.000, t = 7.417). Problem Awareness (β=0.312) and Self-Efficacy (β=0.368) are declared to have a positive and significant influence on Personal Norm (H3: p-value = 0.000, t = 5.074; H4: p-value = 0.000, t = 5.841). Personal Norm (β=0.816) positively and significantly affects Intention to Switch EV (H5; p-value = 0.000, t = 35.737).

This study's Value Belief Norm (VBN) model explores individuals' intentions to switch from conventional fuel vehicles with internal combustion engines to electric cars. The research results indicate that Problem Awareness (H3) and Self-efficacy (H4) positively and significantly impact Personal Norms in switching to electric vehicles. Problem awareness is considered a form of an individual's awareness of environmental issues (Taso et al., 2020). When switching to electric cars, problem awareness is seen as an individual's awareness of environmental problems caused by fossil fuel vehicles. The higher an individual's problem awareness, the more likely they will have a personal norm to switch to electric cars. This is

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

because someone aware of environmental issues is more inclined to take actions that can reduce environmental impact, such as switching to electric vehicles.

Self-efficacy is also considered an individual's belief in their ability to do something. The higher an individual's self-efficacy, the more likely they will have a personal norm to switch to electric vehicles. People who believe they can use electric cars are more inclined to take such action.

Furthermore, the New Environmental Paradigm (NEP) positively and significantly influences problem awareness and self-efficacy in switching to electric vehicles. This is because the NEP enhances public awareness of the importance of environmental preservation. Individuals who are aware of the significance of environmental conservation are more motivated to replace their vehicles with electric ones that are more environmentally friendly. The NEP also increases the public's self-efficacy in transitioning to electric cars. This is because the NEP instills confidence in the public that they can replace their vehicles with electric ones. Individuals confident in their abilities are more likely to act to switch their cars.

Furthermore, the research results indicate that personal norms have positively and significantly influenced the intention to switch to electric vehicles (EVs). In other words, individuals with a high personal norm to switch to electric cars are more likely to intend to make the switch. People who believe that air pollution is a severe issue are more inclined to switch to electric vehicles because they perceive it as an appropriate way to reduce air pollution. This study specifically focuses on the population of conventional internal combustion engine vehicle users in Jakarta. Consequently, the generalization of findings is limited to the scope of Jakarta only. Therefore, there is a need for sample expansion to encompass various demographic and geographic groups to present a broader picture of factors influencing the intention to adopt electric vehicles in Indonesia.

Additionally, it does not consider external factors such as government regulations, charging infrastructure, and electric vehicle prices that may impact adoption intentions. Subsequent research could integrate these variables to understand better the macro-context that influences user vehicle decisions. Furthermore, future research could also explore how communication strategies and marketing campaigns can leverage these findings to enhance electric vehicle adoption.

CLOSING

Conclusion

This research aims to identify the psychological factors influencing the intention to adopt electric vehicles in Jakarta using the VBN model. The results of SEM-PL indicate that several factors from the research variables strongly influence an individual's intention to switch to electric vehicles. The problem of Awareness and Self-Efficacy positively and significantly influence personal norms. Additionally, the New Environmental Paradigm (NEP) positively and significantly affects the Problem of Awareness and Self-Efficacy. The research also shows that personal norms positively influence the intention to switch from conventional to electric vehicles.

DOI: https://doi.org/10.54443/sibatik.v4i2.2487

Theoretical Implications

This research has profound theoretical implications, particularly in two main aspects: using electric vehicles (EVs) in Jakarta and applying the Value-Belief-Norm (VBN) Theory in the context of consumer intentions to engage in environmentally friendly behavior. In the Jakarta context, the significant shift in the individual and business intentions to use electric vehicles reflects a social transformation that contributes to global efforts to reduce carbon emissions and positions Jakarta as a forward-thinking and environmentally conscious metropolitan city. This shift is not just about transportation but also reflects a collective commitment to sustainable practices, which, in turn, can propel the city toward a cleaner and more sustainable future. These implications provide insight into how awareness of environmental impact can lead to positive changes in societal behavior. On the other hand, using the Value-Belief-Norm (VBN) Theory in this research context provides crucial insights into the influence of individual values on pro-environmental behavior, especially concerning the use of electric vehicles. Although VBN has been employed previously in environmental behavior, this research highlights the need for more in-depth studies in measuring consumer intentions to engage in environmentally friendly behavior. This research indicates that value orientations, particularly altruistic values, play a significant role in shaping pro-environmental behavior, such as using electric vehicles.

Policy and Business Implications

The results of this study have significant implications for the business world and policies in the motor vehicle sector. By highlighting the role of the Value Belief Norm (VBN) model, this research indicates the importance of understanding psychological factors and personal values in motivating individuals to switch to electric vehicles. In a business context, automotive companies and related industries can seize the opportunity to develop marketing strategies focusing more on environmental aspects, emphasizing electric vehicles' benefits in reducing negative environmental impacts. Building awareness of the New Environmental Paradigm (NEP) and supporting environmentally friendly personal norms can be a crucial foundation for creating a larger market for electric vehicles.

From a policy perspective, the government can consider incentives and regulations supporting electric vehicle adoption. Responding to findings that personal norms positively influence the intention to replace conventional motor vehicles, policies can be designed to reinforce these norms through education and campaigns that increase awareness of environmental issues. However, it should be noted that the Problem of Awareness and Self-Efficacy significantly impacts the intention to switch to electric vehicles. Therefore, policy and business efforts should focus more on building effective awareness and enhancing individuals' confidence in adopting these changes. Public campaigns that provide relevant information and improve practical skills can be concrete steps supporting the transformation towards sustainable vehicles.

Limitations and Recommendations for Future Research

Although this research contributes significantly to understanding the psychological factors influencing the intention to adopt electric vehicles in Jakarta, it has some limitations. One of them is that the study focuses on the population of users of conventional internal combustion engine vehicles in Jakarta. Consequently, the generalization of findings is limited to this specific group. Future research could broaden the sample coverage to include various demographic and geographic groups to provide a broader overview of the factors influencing the intention to adopt electric vehicles in Indonesia. Additionally, it does not consider external factors such as government regulations, charging infrastructure, and the pricing of electric cars that can influence adoption intentions. Subsequent research could integrate these variables to understand better the macro-context that influences users' vehicle decisions.

On the other hand, this research is expected to explore how communication strategies and marketing campaigns can leverage these findings to enhance the adoption of electric vehicles. Further analysis of the role of social factors, such as group opinions and community support, can also be a crucial consideration. By refining and expanding this research, a more substantial foundation can be provided for developing policies, marketing strategies, and more effective approaches to promote the adoption of electric vehicles in Indonesia, particularly in Jakarta.

REFERENCES

Asadi, S., Nilashi, M., Samad, S., Abdullah, R., Mahmoud, M., Alkinani, M. H., & Yadegaridehkordi, E. (2021). Factors impacting consumers' intention toward adoption of electric vehicles in Malaysia. *Journal of Cleaner Production*, *282*, 124474. https://doi.org/10.1016/j.jclepro.2020.124474

Ateş, H. (2020). Merging Theory of Planned Behavior and Value Identity Personal norm model to explain pro-environmental behaviors. *Sustainable Production and Consumption*, *24*, 169–180. https://doi.org/10.1016/j.spc.2020.07.006

Bahtiar, Adjisasmita, S. A., Ramli, M. I., & Pasra, M. (2020). Model influence means operational performance in the port of Jayapura. *IOP Conference Series: Earth and Environmental Science*, *419*(1), 012097. https://doi.org/10.1088/1755-1315/419/1/012097

Burnham, M., & Ma, Z. (2017). Climate change adaptation: factors influencing Chinese smallholder farmers' perceived self-efficacy and adaptation intent. *Regional Environmental Change*, *17*(1), 171–186. https://doi.org/10.1007/s10113-016-0975-6

Chen, X., Cheng, Q., & Wang, X. (2015). Does increased board independence reduce earnings management? Evidence from recent regulatory reforms. *Review of Accounting Studies*. https://doi.org/10.1007/s11142-015-9316-0

CNBC. (2023). *3 Hari Absen, Jakarta Masuk Lagi dalam 10 Kota Paling Polusi*. https://www.cnbcindonesia.com/research/20230829065549-128-466937/3-hari-absen-Jakarta-masuk-lagi-dalam-10-kota-paling-polusi

Databoks. (2023). *Riset Deloitte dan Foundry: Penggunaan Motor Listrik di Indonesia Naik 13 Kali Lipat dalam Dua Tahun*.

https://databoks.katadata.co.id/datapublish/2023/09/15/riset-deloitte-dan-foundry-penggunaan-motor-listrik-di-indonesia-naik-13-kali-lipat-dalam-dua-tahun

Garaika, G., Margahana, H. M., & Negara, S. T. (2019). Self efficacy, self personality and self confidence on entrepreneurial intention: study on young enterprises. *Journal of Entrepreneurship Education*, *22*(1), 1–12.

Glazer, S., & Liu, C. (2017). Work, Stress, Coping, and Stress Management. In *Oxford Research Encyclopedia of Psychology*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190236557.013.30

Gunawan, I., Redi, A. A. N. P., Santosa, A. A., Maghfiroh, M. F. N., Pandyaswargo, A. H., & Kurniawan, A. C. (2022). Determinants of Customer Intentions to Use Electric Vehicle in Indonesia: An Integrated Model Analysis. *Sustainability*, *14*(4), 1972. https://doi.org/10.3390/su14041972

Han, H., Olya, H. G. T., Cho, S., & Kim, W. (2018). Understanding museum vacationers' eco-friendly decision-making process: strengthening the VBN framework. *Journal of Sustainable Tourism*, *26*(6), 855–872. https://doi.org/10.1080/09669582.2017.1377210

He, X., & Zhan, W. (2018). How to activate moral norm to adopt electric vehicles in China? An empirical study based on extended norm activation theory. *Journal of Cleaner Production*, *172*, 3546–3556. https://doi.org/10.1016/j.jclepro.2017.05.088

Hu, X., Wang, S., Zhou, R., Gao, L., & Zhu, Z. (2023). Determinants of consumers' intentions to switch to electric vehicles: a perspective of the push-pull–mooring framework. *Journal of Environmental Planning and Management*, 1–26. https://doi.org/10.1080/09640568.2023.2232945

I Wayan, S., Nadiroh, N., & Neolaka, A. (2019). The Effects of Knowledge about Ecology, Biospheric and Egoistic Values toward New Environmental Paradigm. *Proceedings of the 1st International Conference on Innovation in Education (ICoIE 2018)*. https://doi.org/10.2991/icoie-18.2019.40

Iriyadi. (2019). Prevention of Earnings Management through Audit Committee and Audit Quality in the Award-Winning and Non-Winning Companies. *Journal of Accounting Research, Organization and Economics*, *2*(2), 155–169. https://doi.org/10.24815/jaroe.v2i2.14631

Jing, W., Yan, Y., Kim, I., & Sarvi, M. (2016). Electric vehicles: A review of network modelling and future research needs. *Advances in Mechanical Engineering*, *8*(1), 168781401562798. https://doi.org/10.1177/1687814015627981

Karimi, S. (2019). Pro-Environmental Behaviours among Agricultural Students: An Examination of the Value-Belief-Norm Theory. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3398141

Keizer, M., Sargisson, R. J., van Zomeren, M., & Steg, L. (2019). When personal norms predict the acceptability of push and pull car-reduction policies: Testing the ABC model and low-cost hypothesis. *Transportation Research Part F: Traffic Psychology and Behaviour*, *64*, 413–423. https://doi.org/10.1016/j.trf.2019.06.005

Kondratowicz, B., Godlewska-Werner, D., Połomski, P., & Khosla, M. (2022). Satisfaction with job and life and remote work in the COVID-19 pandemic: the role of perceived stress, self-efficacy and self-esteem. *Current Issues in Personality Psychology*, *10*(1), 49–60. https://doi.org/10.5114/cipp.2021.108097

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

Lind, H. B., Nordfjærn, T., Jørgensen, S. H., & Rundmo, T. (2015). The value-belief-norm theory, personal norms and sustainable travel mode choice in urban areas. *Journal of Environmental Psychology*, *44*, 119–125. https://doi.org/10.1016/j.jenvp.2015.06.001

Majeed, S., Kim, W. G., & Kim, T. (2023). Perceived green psychological benefits and customer pro-environment behavior in the value-belief-norm theory: The moderating role of perceived green CSR. *International Journal of Hospitality Management*, *113*, 103502. https://doi.org/10.1016/j.ijhm.2023.103502

Manoli, C., Johnson, B., Buxner, S., & Bogner, F. (2019). Measuring Environmental Perceptions Grounded on Different Theoretical Models: The 2-Major Environmental Values (2-MEV) Model in Comparison with the New Ecological Paradigm (NEP) Scale. *Sustainability*, *11*(5), 1286. https://doi.org/10.3390/su11051286

Nordlund, A., Jansson, J., & Westin, K. (2016). New Transportation Technology: Norm Activation Processes and the Intention to Switch to an Electric/Hybrid Vehicle. *Transportation Research Procedia*, *14*, 2527–2536. https://doi.org/10.1016/j.trpro.2016.05.334

Novizayanti, D., Prasetio, E. A., Siallagan, M., & Santosa, S. P. (2021). Agent-Based Modeling Framework for Electric Vehicle Adoption Transition in Indonesia. *World Electric Vehicle Journal*, *12*(2), 73. https://doi.org/10.3390/wevj12020073

Ntanos, S., Kyriakopoulos, G., Skordoulis, M., Chalikias, M., & Arabatzis, G. (2019). An Application of the New Environmental Paradigm (NEP) Scale in a Greek Context. *Energies*, *12*(2), 239. https://doi.org/10.3390/en12020239

Onwezen, M. C., Antonides, G., & Bartels, J. (2013). The Norm Activation Model: An exploration of the functions of anticipated pride and guilt in pro-environmental behaviour. *Journal of Economic Psychology*, *39*, 141–153. https://doi.org/10.1016/j.joep.2013.07.005

Park, E., Lee, S., Lee, C.-K., Kim, J. S., & Kim, N.-J. (2018). An integrated model of travelers' pro-environmental decision-making process: the role of the New Environmental Paradigm. *Asia Pacific Journal of Tourism Research*, *23*(10), 935–948. https://doi.org/10.1080/10941665.2018.1513051

Patwary, A. K., Omar, H., & Tahir, S. (2021). The Impact of Perceived Environmental Responsibility on Tourists' Intention To Visit Green Hotel: The Mediating Role of Attitude. *GeoJournal of Tourism and Geosites*, *34*(1), 9–13. https://doi.org/10.30892/gtg.34101-612

Saleem, M. A., Eagle, L., & Low, D. (2021). Determinants of eco-socially conscious consumer behavior toward alternative fuel vehicles. *Journal of Consumer Marketing*, *38*(2), 211–228. https://doi.org/10.1108/JCM-05-2019-3208

Sandhu, Y. A., Perumal, S. A., & Fauzi, W. I. M. (2019). The Predictors and Consequences of Personal Norms in Context of Organic Food Among Pakistani Consumers. *International Journal of Financial Research*, *10*(3), 314. https://doi.org/10.5430/ijfr.v10n3p314

Srivastava, A., Gautam, V., & Sharma, V. (2023). Does consideration for future consequences matter in consumer decision to rent electric vehicles? *Energy Policy*, *181*, 113726. https://doi.org/10.1016/j.enpol.2023.113726

Sudjoko, C., Sasongko, N. A., Utami, I., & Maghfuri, A. (2021). Utilization of electric vehicles as an energy alternative to reduce carbon emissions. *IOP Conference Series: Earth and Environmental Science*, *926*(1), 012094. https://doi.org/10.1088/1755-1315/926/1/012094

Tamar, M., Wirawan, H., Arfah, T., & Putri, R. P. S. (2020). Predicting pro-environmental behaviours: the role of environmental values, attitudes and knowledge. *Management of Environmental Quality: An International Journal*, *32*(2), 328–343. https://doi.org/10.1108/MEQ-12-2019-0264

Taso, Y.-C., Ho, C.-W., & Chen, R.-S. (2020). The impact of problem awareness and biospheric values on the intention to use a smart meter. *Energy Policy*, *147*, 111873. https://doi.org/10.1016/j.enpol.2020.111873

Ünal, A. B., Steg, L., & Granskaya, J. (2019). "To support or not to support, that is the question". Testing the VBN theory in predicting support for car use reduction policies in Russia. *Transportation Research Part A: Policy and Practice*, *119*, 73–81. https://doi.org/10.1016/j.tra.2018.10.042

Whitley, C. T., Takahashi, B., Zwickle, A., Besley, J. C., & Lertpratchya, A. P. (2018). Sustainability behaviors among college students: an application of the VBN theory. *Environmental Education Research*, *24*(2), 245–262. https://doi.org/10.1080/13504622.2016.1250151

Yana, A. A. G. A., Rusdhi H.A., & Wibowo, M. A. (2015). Analysis of Factors Affecting Design Changes in Construction Project with Partial Least Square (PLS). *Procedia Engineering*, *125*, 40–45. https://doi.org/10.1016/j.proeng.2015.11.007

Yavuzalp, N., & Bahçivan, E. (2020). The Online Learning Self-Efficacy Scale: Its Adaptation into Turkish and Interpretation According to Various Variables. *Turkish Online Journal of Distance Education*, *21*(1), 31–44. https://doi.org/10.17718/tojde.674388

Zamil, A. M. A., Ali, S., Akbar, M., Zubr, V., & Rasool, F. (2023). The consumer purchase intention toward hybrid electric car: A utilitarian-hedonic attitude approach. *Frontiers in Environmental Science*, *11*. https://doi.org/10.3389/fenvs.2023.1101258

Zhang, L., Sheng, L., Zhang, W., & Zhang, S. (2020). Do Personal Norms Predict Citizens' Acceptance of Green Transport Policies in China. *Sustainability*, *12*(12), 5090. https://doi.org/10.3390/su12125090

Zhao, R., Geng, Y., Liu, Y., Tao, X., & Xue, B. (2018). Consumers' perception, purchase intention, and willingness to pay for carbon-labeled products: A case study of Chengdu in China. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2017.10.143

Zulfikar, M. E. (2023). *Ini Daerah yang Paling Banyak Beli Mobil dan Motor Listrik Secara Online*. Gridoto. https://www.gridoto.com/read/223848466/ini-daerah-yang-paling-banyak-beli-mobil-dan-motor-listrik-secara-online