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Strategies to Increase the Use of Electric Vehicles as Sustainable Transportation in The City of Pontianak

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Abstract

Background Problems: Sustainable development is a major goal for countries around the world to minimize environmental damage. Motor vehicles are a source of problems that cause air pollution. Technological developments have created environmentally friendly electric vehicles, which are considered sustainable vehicles. However, the availability of electricity is still not proportional to the number of motor vehicles. **Introduction / Main Objectives:** The objectives of this study are to describe the public's perception of electric vehicles, analyze the impact of electric vehicles on economic growth, and analyze strategies to increase the use of electric vehicles. **Methods:** This study uses a mixed-method approach (quantitative and qualitative methods). The study population consisted of 442 people. The number of samples calculated using Slovin's formula was 82 people selected at random. The data collection techniques used were questionnaires, documentation, and interviews. Data analysis in this study used descriptive inferential analysis (descriptive statistics), Strength Weakness Opportunity Threat (SWOT) analysis, and Analytical Hierarchy Process (AHP analysis). **Results/ Findings:** The results of the study indicate that the factors influencing the use of electric vehicles in Pontianak City are price, public taste, substitute goods, and supporting facilities for public electric vehicle charging stations (SPKLU). The most important strategy to increase the use of electric vehicles is for the government to control prices and complete the distribution of public electric vehicle charging stations (SPKLU) in Pontianak City. **Conclusions:** Promotion and public education need to be carried out systematically. Manufacturers developing batteries need to increase their lifespan and range so that they can travel long distances when used by the public.

Keywords: Electric vehicles; EVCS; Strategies; Sustainable Transportation
JEL Classification: M40; M41

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INTRODUCTION

High population growth and high activity levels have led to an increase in the number of motor vehicles. Motor vehicles used as a means of transportation cannot be separated from the process of fuel combustion. Fuel combustion is the deliberate oxidation in a device with the aim of providing heat or mechanical work for a process (Doğan Güzel & Alp, 2024). The number of emissions from fossil fuel combustion depends on the amount and type of fuel burned.

Specifically, global greenhouse gas emission data shows that the main contributors to global economic sector emissions in 2015 were electricity production (29%), transportation (27%), and manufacturing (21%), with transportation ranking second after electricity production in terms of global greenhouse gas emissions by sector. According to estimates by the International Energy Agency, carbon dioxide (CO_2) emissions in the transportation sector are expected to increase by 41% in 2030 compared to 2007 levels, reaching approximately 9,3 billion tons (Wang et al., 2020). Therefore, when analyzing the contribution of B&R to the global economy, it is essential to consider emission levels.

Solid particles, carbon monoxide, ozone, nitrogen dioxide, and sulfur dioxide are some of the pollutants that are of primary concern to public health (WHO, 2021). According to data from the World Health Organization (WHO), nearly the entire global population (99%) breathes air that exceeds WHO guidelines and contains high levels of pollutants. Most deaths from air pollution are likely to occur in cities, especially in developing countries with rapidly growing urban populations (Garzón Baquero & Bellon Monsalve, 2024).

To reduce the threat of climate change to the environment, an international agreement known as the Paris Agreement was signed in 2016. This agreement is an integral part of the global strategic fight against climate change and the "Ratchet" mechanism that began in 2023, a periodic evaluation and restriction initiative. However, reducing emissions in the transportation sector depends not only on the actual carbon dioxide (CO_2) situation, but also on the level of economic development of each country (Fairuz Rofifah Arifin & Nazwa Aulia Rahman, 2024).

The United Nations (UN) formulated the Sustainable Development Goals (SDGs) for 2030, which emphasize the importance of affordable and clean energy, technological innovation, sustainable forest management, sustainable and comprehensive economic progress, and global cooperation for sustainable development in the face of climate change. Scientists argue that there is an inseparable link between globalization and carbon emissions on Earth. Interestingly, globalization has turned out to be one of the fastest growing and most significant aspects of economic growth in developing countries.

Electric Vehicles (EVs), or what we know as electric vehicles, are increasingly recognized as an important component in global efforts to achieve the Sustainable Development Goals (SDGs) set by the United Nations (UN). Electric Vehicles (EVs), or what we know as electric vehicles, are specifically linked to several of these goals, offering a path to a more sustainable and environmentally friendly future (Candan et al., 2023).

Several studies show that electric vehicles can reduce air pollution in urban areas by up to 40%. However, other studies state that electric vehicles are not yet effective enough to significantly reduce air pollution, especially if the source of electricity still comes from coal-fired power plants (Ansah & Susilowati, 2023). The following are some sources of electrical energy in West Kalimantan at present.

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Table 1. Types and capacities of power plants in the West Kalimantan Electricity System

Types of Power Plants	Capacity (MW)
Diesel Power Plant	181
Gas Engine Power Plant	100
Electric steam power plant	310
Biogas Power Plant	1
Hydroelectric power plant	80
Total	672

Source: PLN West Kalimantan Distribution Unit)

Based on www.katadata.co.id Air Pollution Index (API) data for West Kalimantan shows that it is one of the cities with the highest air pollution in Indonesia on July 23, 2025, out of 10 cities measured with the following Air Pollution Index (API) levels in Figure 1.

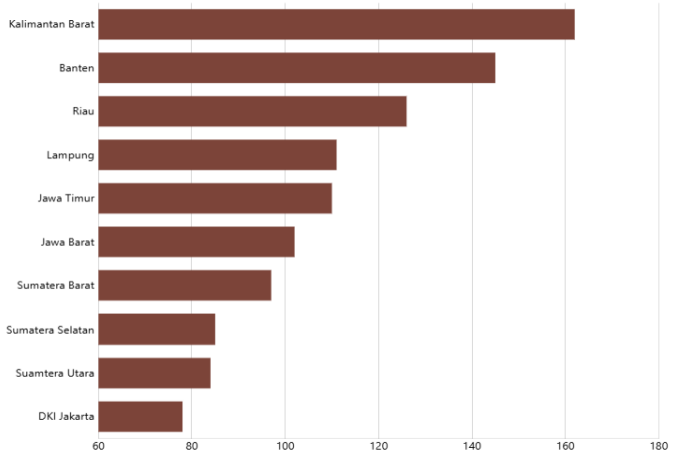

Figure 1. Data on the 10 cities in Indonesia with the highest Air Pollution Index (API) levels in 2025
source: www.katadata.co.id (2)

This study discusses the social and economic aspects of electric vehicle adoption and how government policies can support this transition. Based on the above explanation, this study is interested in examining the Strategy for Increasing the Use of Electric Vehicles as Sustainable Transportation in the City of Pontianak.

RESEARCH METHOD

The research method used is Mixed Methods. Mixed methods is a research method that combines two research approaches, namely qualitative and quantitative approaches. This research was conducted in Pontianak City in 2025. Pontianak City was chosen because it is the largest city for electric vehicles in West Kalimantan Province. Pontianak City has the largest population compared to other districts/cities in West Kalimantan Province. This research was conducted from October to November 2025 with a limited research focus on analyzing the factors that influence the use of electric vehicles and developing strategies to increase the use of electric vehicles.

The research variables were divided into two categories in this study, namely independent variables and dependent variables. Independent variables included price, income, intensity

of need, taste, substitute goods, products, government policies, promotion, and supporting facilities. Meanwhile, the dependent variable was the use of electric vehicles.

In general, the population is the entire group of subjects with certain characteristics that are the target of the study. In the context of this study, the population is defined as all electric vehicle users in Pontianak City (2021–2025 period), totaling 442 people.

The sample size was determined using the Slovin formula with a margin of error of 10% (1). This method was chosen because it is efficient and accurate for populations whose size is known with certainty.

$$n = \frac{N}{1 + N\,(e)^2}$$

$$n = \frac{442}{1+442\,(0{,}1)^2} == \text{ 81,55 rounded up to 82} \qquad (1)$$

Data was obtained from questionnaires, documentation, and interviews. Then, validity and reliability tests were conducted. This was done to measure whether the data obtained after the research was valid or not using the measuring instruments used. The reliability test is the extent to which measurements using the same object will produce the same data (Sugiyono, 2022). Data analysis was described using descriptive analysis, analysis of factors affecting electricity usage, SWOT analysis (Strengths, Weaknesses, Opportunities, Threats), and AHP (Analytical Hierarchy Process) to develop strategies for increasing the use of electric vehicles.

RESULTS AND DISCUSSION

The population of Pontianak City continues to grow, reaching approximately 690,277 people in the first half of 2025, with 344,795 men and 345,482 women. The number of motor vehicles in Pontianak City in February 2025 reached more than 51,120 units, indicating high and increasing vehicle density, exceeding the vehicle population in other areas of West Kalimantan. The dominant and most numerous types of motor vehicle is the two-wheeled motor vehicle, with 45,289 units in Pontianak City.

As of July 2023, there were 308 two-wheeled electric vehicles in West Kalimantan Province, while the number of four-wheeled electric vehicles as of July 2023 was 51 (Bapenda Prov. Kalbar). One of the factors hindering this adoption is the lack of adequate infrastructure, particularly electric vehicle charging stations (SPKLU) (Wicaksono et al., 2024). To achieve this potential, adequate infrastructure is needed, particularly electric vehicle charging stations (SPKLU). Based on the research, the characteristics of the respondents are described as follows:

Table 2. Characteristics of respondents based on gender

No	Gender	Frequency	Percentage (%)
1	Men	55	67,1
2	Women	27	32,9
	Total	82	100

Source: data processed

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Table 3. Characteristics of Respondents Based on Education

No	Education	Frequency	Percentage (%)
1	SMA	38	46,3
2	D3	14	17,1
3	S1	24	29,3
4	S2	6	7,3
Total		82	100

Source: data processed

These results show that more men than women prefer electric vehicles for daily activities, and most electric vehicle users have a high school education.

Based on the results of the research for the statistical description of variables, including the lowest score, highest score, and average score, the following can be seen:

Table 4. Statistical Description

	N	Minimum	Maximum	Mean	Std. Deviation
Use of Electric Vehicles	82	4	16	11,98	2,282
Price	82	8	16	11,83	1,858
Income	82	8	16	11,38	2,047
Intensity of need	82	3	8	5,65	1,221
Preference	82	10	20	14,93	2,182
Substitute Goods	82	6	12	9,20	1,567
Promotion	82	5	12	8,15	1,564
Policy	82	8	16	12,38	2,215
Product	82	9	20	14,74	2,600
Supporting Facilities	82	4	12	8,59	1,648

Source: data processed

Based on the results of the variable description research, it is known that the standard deviation values of each variable are not very large or are not far from 0. A standard deviation value close to 0 means that the data distribution is not far from the mean value or, in other words, the scores obtained by respondents are still around the overall mean value.

Data analysis in this study consists of several tests used to analyze research data to answer the research questions and objectives. Data analysis in this study consists of normality tests, classical assumption tests, model coefficient tests, hypothesis tests, SWOT analysis, and AHP analysis.

The normality test aims to determine whether the analysis between the dependent variable and the independent variable has a normal distribution. The basis for decision making is that if the significance probability is above 5% confidence, then the regression model meets the normality assumption (Ghozali, 2018). Based on the results of the normality test using Kolmogorov-Smirnov, a probability or significance value of 0,200 was obtained. This value is greater than 0,05, so it can be said that the data is normally distributed.

The classical assumption tests used in this study are multicollinearity and heteroscedasticity tests. These two tests are prerequisites for performing multiple linear regression tests. The classical assumption tests in this study were conducted using SPSS V.25. The multicollinearity test results show that all independent variables obtained tolerance values greater than 0,10 with VIF values less than 10. These results indicate that

the variables of price, income, intensity of need, taste, substitute goods, promotion, policy, product, and supporting facilities did not experience multicollinearity.

The heteroscedasticity test aims to test whether there is variance inequality in the regression model from one observation to another. The Glejser test proposes to regress the absolute residual value against the independent variable. The probability result is said to be significant if the significance value is above the 5% confidence level.

The results of the heteroscedasticity test using the Glejzer test show that the variables of price, income, intensity of need, taste, substitute goods, promotion, policy, product, and supporting facilities all have probability values or significance greater than 0,05. Based on the research results, a multiple linear regression test was conducted to determine the coefficient values of each variable. The results of the multiple linear regression testing and processing show that the value of the price variable coefficient is 0,449, which is the highest value compared to other variables. The variable with the lowest coefficient is variable X7 or the policy variable, which only has a value of 0,062.

Based on the results of the coefficient of determination test, an R value of 0,930 was obtained. This value indicates that the variables of price, income, intensity of need, taste, substitute goods, promotion, policy, product, and supporting facilities have a very strong relationship with the use of electric vehicles. The R Square value from the test results was 0,865. This value means that price, income, intensity of need, taste, substitute goods, promotion, policy, product, and supporting facilities have an 86.5% influence on the use of electric vehicles. Meanwhile, the remaining 13,5% is influenced by factors outside the research model.

The F test result obtained a calculated F value of 57.554 with a probability value of 0.000. The calculated F value is greater than the F table (57.554>2.61) and the probability is also lower than 0.05 (0.000<0.05), so the hypothesis is accepted. This means that simultaneously or collectively, the variables of price, income, intensity of need, taste, substitute goods, promotion, policy, product, and supporting facilities have a significant effect on the use of electric vehicles in the city of Pontianak. Based on the results of the research data analysis, the partial t-test results can be seen as follows:

Table 5. Hypothesis Testing

Variable	t	sig
Constant	1.854	.068
Price	4.791	.000
Revenue	.720	.474
Intensity of Need	1.031	.306
Appetite	2.293	.020
Substitute Goods	2.308	.035
Promotion	1.059	.293
Policies	.642	.523
Product	1.638	.106
Supporting Facilities	2.079	.049

Source: data processed

Table 5 shows that the effect of price on the use of electric vehicles obtained a t-value of 4.791 with a probability value of 0.000. This significant value is lower than 0.05,

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so the hypothesis that price has a significant effect on the use of electric vehicles is accepted. Table 5 shows that the effect of income on the use of electric vehicles obtained a t-value of 0.720 with a probability value of 0.474. This significant value is greater than 0.05, so the hypothesis that income has no significant effect on the use of electric vehicles is rejected.

Table 5 shows that the effect of intensity of need on electric vehicle usage obtained a t-value of 1.031 with a probability value of sig 0.306. This significant value is greater than 0.05, so the hypothesis that intensity of need has no significant effect on electric vehicle usage is rejected. The effect of taste on the use of electric vehicles obtained a t-value of 2.293 with a probability value of 0.020. This significant value is lower than 0.05, so the hypothesis that taste has a significant effect on the use of electric vehicles is accepted.

Table 5 shows that The effect of substitute goods on electric vehicle usage obtained a t-value of 2.308 with a probability value of 0.035. This significant value is lower than 0.05, so the hypothesis that substitute goods have a significant effect on electric vehicle usage is accepted. The effect of promotion on electric vehicle usage obtained a t-value of 1.059 with a probability value of 0.293. This significant value is greater than 0.05, so the hypothesis that promotion has no significant effect on electric vehicle usage is rejected.

Table 5 shows that the effect of policy on electric vehicle usage obtained a t-value of 0.642 with a probability value of 0.523. This significant value is greater than 0.05, so the hypothesis that policy has no significant effect on electric vehicle usage is rejected. The effect of products on electric vehicle usage obtained a t-value of 1.638 with a probability value of 0.106. This significant value is greater than 0.05, so the hypothesis that products have no significant effect on electric vehicle usage is rejected.

Table 5 shows that the effect of supporting facilities on the use of electric vehicles obtained a t-value of 2.079 with a probability value of 0.049. This significant value is lower than 0.05, so the hypothesis that supporting facilities have a significant effect on the use of electric vehicles is accepted.

Table 6. SWOT Analysis Results

SWOT	S (strength) 1. Environmentally friendly 2. Energy efficient 3. Low maintenance costs	W (weakness) 1. SPKLU is still lacking 2. Low mileage 3. High price
O (opportunity) 1. Supporting carbon emission reduction 2. There will be many people interested in electric vehicles if they meet expectations	S-O *objectives* 1. Educating the public about EVs 2. Increasing EV promotion through social media	W-O *objectives* 1. Adding SPKLU 2. Prices are pushed lower
T (threat) 1. Electrical circuits prone to fire 2. Hazardous battery waste	S-T *objectives* 1. Quality Control EV with good standards 2. Proper waste management	W-T *objectives* 1. Increasing battery mileage 2. At each SPKLU, vehicles are provided with free technical inspections

Source: data processed

Based on the results of the Analytical Hierarchy Process (AHP) analysis, the following results were obtained. Based on the results of the Analytical Hierarchy Process (AHP) analysis, the following results were obtained:

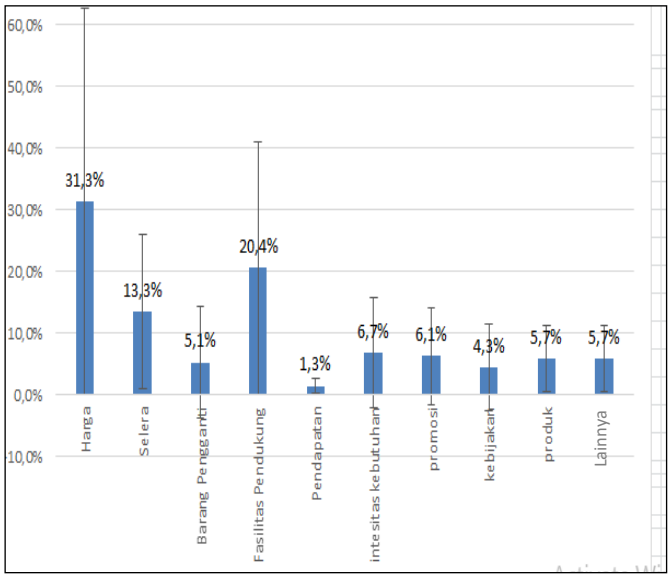

Figure 2. Analytical Hierarchy Process (AHP) Output

Based on the results of the study, it is known that from the AHP data analysis of the 9 factors tested, the highest value was obtained for the price variable. The price variable test results obtained a priority value of 31.3% or 0.313. This value is the highest of the 9 variables analysed. These results indicate that to improve the strategy for using electric vehicles, the price variable needs to be analysed further to determine a price that meets public expectations. Based on the results of the study, it is known that the factors that significantly influence the use of electric vehicles in Pontianak City are price, public taste, substitute goods, and supporting facilities. Increasing EV use in Pontianak requires a combination of price subsidies, expansion of charging infrastructure, and public education to reduce initial cost barriers and range anxiety.

CONCLUSION

Based on the results of the research and discussion, the following conclusions can be drawn from this study. There are four factors that significantly influence the use of electric vehicles in Pontianak City. First, price has been proven to determine the extent of electric vehicle use in Pontianak City. This result means that the public's perception of the price applied to electric vehicles can determine whether the public chooses to use them or not. Second, the influencing factor is the supporting facilities around Pontianak City. The public perceives that the availability of adequate and easily accessible SPKLU will determine the extent of electric vehicle use. Facilities that make it easier for the public will encourage them to choose to use electric vehicles. Third, the third factor that determines the extent of electric vehicle usage is public preference. People living in the city center and those living in the suburbs will have different preferences. This is because they are indirectly influenced by the availability of public electric vehicle charging stations (SPKLU). The availability of complete supporting facilities will increase public preference, which will ultimately increase the use of electric vehicles. Fourth, the factor that influences the level of electric vehicle

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usage is substitute goods. Electric vehicles are used as an alternative option when traveling short distances or within the city.

The strategy to increase the use of electric vehicles in Pontianak City to reduce prices is to implement a tax incentive policy. The government must collaborate to minimize production costs, thereby lowering the price of electric vehicles. Additionally, supporting facilities such as public electric vehicle charging stations (SPKLU) need to be improved to encourage the public to use electric vehicles.

REFRENCES

Agustinus, A. K. J., Setiawan, A., & Djajadikerta, H. (2024). Menggali Dinamika Minat Beli Kendaraan Listrik: Faktor Kepedulian Lingkungan Dan Ekonomi. *Journal of Social and Economics Research*, *6*(1), 743–755. https://doi.org/10.54783/jser.v6i1.402

Ahmad, S., & Alsuhaibany, Y. (2026). Small Feet, Big Prints: The Contribution of Family-Owned Micro, Small, and Medium Enterprises to Sustainable Development Goals. *Business Ethics, the Environment & Responsibility*, *35*(1), 199–214. https://doi.org/10.1111/beer.12790

Ahmed, N., & Turchini, G. M. (2021). Recirculating aquaculture systems (RAS): Environmental solution and climate change adaptation. *Journal of Cleaner Production*, *297*, 126604. https://doi.org/10.1016/j.jclepro.2021.126604

Allan, D. D., Vonasch, A. J., & Bartneck, C. (2022). The Doors of Social Robot Perception: The Influence of Implicit Self-theories. *International Journal of Social Robotics*, *14*(1), 127–140. https://doi.org/10.1007/s12369-021-00767-9

Almatar, K. M. (2024). Smart transportation planning and its challenges in the Kingdom of Saudi Arabia. *Sustainable Futures*, *8*, 100238. https://doi.org/10.1016/j.sftr.2024.100238

Amin, N., Sharif, A., Tayyab, M., & Pan, Y. (2025). Green Technological Advances and Resource Rents as Levers for Carbon Reduction in : Implications for 7, 8, 9, 12, and 13. *Sustainable Development*, *33*(3), 3171–3195. https://doi.org/10.1002/sd.3294

Ansah, R., & Susilowati. (2023). Dampak Kendaraan Listrik Terhadap Lingkungan Dan Sumberdaya Alam: Isu Mutakhir Dalam Transportasi Berkelanjutan. *Zahra*, *13*(1), 104–116.

Anthony Jnr., B. (2024). Developing green urban mobility policies for sustainable public transportation in local communities: a Norwegian perspective. *Journal of Place Management and Development*, *17*(1), 136–155. https://doi.org/10.1108/JPMD-05-2023-0051

Arifin, F. R., & Rahman, N. A. (2024). Analisis Pengaruh Emisi Zat Karbon terhadap Kerusakan Kualitas Udara dan Pencemaran Lingkungan. *Journal Innovation In Education*, *2*(1), 278–287. https://doi.org/10.59841/inoved.v2i1.1043

Baffour Gyau, E., Li, Y., & Adu, D. (2023a). Investigating the impact of ICT on transport-based CO2 emissions: empirical evidence from a quantile cointegration regression analysis. *Environmental Science and Pollution Research*, *31*(3), 4606–4629. https://doi.org/10.1007/s11356-023-31395-7

Baffour Gyau, E., Li, Y., & Adu, D. (2023b). Investigating the impact of ICT on transport-based CO2 emissions: empirical evidence from a quantile cointegration regression analysis. *Environmental Science and Pollution Research*, *31*(3), 4606–

4629. https://doi.org/10.1007/s11356-023-31395-7

Baquero, G. J. E., & Bellon Monsalve, D. (2024). From fossil fuel energy to hydrogen energy: Transformation of fossil fuel energy economies into hydrogen economies through social entrepreneurship. *International Journal of Hydrogen Energy*, *54*, 574–585. https://doi.org/10.1016/j.ijhydene.2023.06.123

Baras, T. P. Y., Hendri, I., Pebrianti, W., Ramadania, R., & Heriyadi, H. (2025). Analisis Faktor-Faktor yang Mempengaruhi Niat Membeli Mobil Listrik: Attitude, New Ecological Paradigm, Manfaat Ekonomi, Pengaruh Sosial, dan Charging Infrastructure. *Jurnal Bisnis Dan Kewirausahaan*, *14*(1), 31–45. https://doi.org/10.37476/jbk.v14i1.4939

Bernando, F. O., & Ray, E. L. (2024). Niat Pembelian Kendaraan Listrik dengan Faktor Pendukung Harga, Sikap, Norma Subjektif dan Kontrol Perilaku. *Jurnal Ilmiah Manajemen Dan Bisnis*, *25*(1), 59–73.

Bhatta, K., Barbieri, C., KC, B., & Roman, M. (2025). Agritourism and sustainability: advancing the Sustainable Development Goals (SDGs). *Tourism Review*, *2*(3). https://doi.org/10.1108/TR-10-2024-0900

Candan, A. K., Boynuegri, A. R., & Onat, N. (2023). Sustainable Energy, Grids and Networks. *Elsevier*, *34*.

Charness, G., & Sontuoso, A. (2023). The Doors of Perception: Theory and Evidence of Frame-Dependent Rationalizability. *American Economic Journal: Microeconomics*, *15*(2), 309–344. https://doi.org/10.1257/mic.20210082

Clayton, C., Maggiori, M., & Schreger, J. (2025). A Theory of Economic Coercion and Fragmentation. *SSRN Electronic Journal*, *December*. https://doi.org/10.2139/ssrn.5076012

Cook, M. (2021). *Perceiving Others*. Routledge. https://doi.org/10.4324/9781003173908

Delgado-Ceballos, J., Ortiz-De-Mandojana, N., Antolín-López, R., & Montiel, I. (2023). Connecting the Sustainable Development Goals to firm-level sustainability and ESG factors: The need for double materiality. *BRQ Business Research Quarterly*, *26*(1), 2–10. https://doi.org/10.1177/23409444221140919

Elbanna, M., Wadi, M. F., Radiamoda, A. M., Matsuyama, Y., & Ishak, M. H. Bin. (2025). A Bibliometric Analysis of Sustainable Development Goals (SDGs) Through the Lens of Maqasid Shariah Tafsir. *QiST: Journal of Quran and Tafseer Studies*, *4*(1), 1–22. https://doi.org/10.23917/qist.v4i1.7360

Fath, N., Rizky, A., Rakhman, A., Maulana, S., & Sujono, S. (2022). Perancangan Mobil Listrik Menggunakan Motor DC Brushed 36 Volt 450 Watt. *Kilat*, *11*(1), 10–20. https://doi.org/10.33322/kilat.v11i1.1334

Filonchyk, M., Peterson, M. P., Zhang, L., Hurynovich, V., & He, Y. (2024a). Greenhouse gases emissions and global climate change: Examining the influence of CO2, CH4, and N2O. *Science of The Total Environment*, *935*, 173359. https://doi.org/10.1016/j.scitotenv.2024.173359

Filonchyk, M., Peterson, M. P., Zhang, L., Hurynovich, V., & He, Y. (2024b). Greenhouse gases emissions and global climate change: Examining the influence of CO2, CH4, and N2O. *Science of The Total Environment*, *935*, 173359.

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https://doi.org/10.1016/j.scitotenv.2024.173359

Fitri, N., Inda, T., Rahma, F., Islam, U., Sumatera, N., Korespondensi, E., Layanan, K., & Konsumen, P. (2022). Permintaan Konsumen Depot Air Minum Semuril. *Sibatik Journal*, *1*(3), 151–162.

Fuller, R., Landrigan, P. J., Balakrishnan, K., Bathan, G., Bose-O'Reilly, S., Brauer, M., Caravanos, J., Chiles, T., Cohen, A., Corra, L., Cropper, M., Ferraro, G., Hanna, J., Hanrahan, D., Hu, H., Hunter, D., Janata, G., Kupka, R., Lanphear, B., … Yan, C. (2022). Pollution and health: a progress update. *The Lancet Planetary Health*, *6*(6), e535–e547. https://doi.org/10.1016/S2542-5196(22)00090-0

Gani, M. Y. S., & Garniwa, I. (2023). Analisis Persepsi Masyarakat Terhadap Purchase Intention Kendaraan Listrik Dengan Metode SEM. *Energi Dan Kelistrikan: Jurnal Ilmiah*, *15*(2), 84–100. https://jurnalitpln.id/energi/article/view/2086

Ghozali, I. (2018). *Aplikasi Analisis Multivariate Dengan Program IBM SPSS 25*. Badan Penerbitan Universitas Diponegoro.

Güzel, D. T., & Alp, K. (2024a). The effects of technological developments in transportation vehicles on air pollution mitigation of metropolitan cities: A case study of Istanbul. *Science of The Total Environment*, *912*, 168996. https://doi.org/10.1016/j.scitotenv.2023.168996

Güzel, D. T., & Alp, K. (2024b). The effects of technological developments in transportation vehicles on air pollution mitigation of metropolitan cities: A case study of Istanbul. *Science of The Total Environment*, *912*, 168996. https://doi.org/10.1016/j.scitotenv.2023.168996

Hasan, S., Fahrezi, M. F. V., Bahari, A. F., Ashoer, M., & Syahnur, M. H. (2025). Gaya Hidup, Desain Futuristik & Teknologi: Determinan Faktor yang Mempengaruhi Minat Membeli Mobil Listrik. *Jurnal Manajemen Dan Bisnis Indonesia*, *11*(1), 43–56. https://doi.org/10.32528/jmbi.v11i1.2857

Hassouna, F. M. A., & Shin, K. (2024). Hydrogen Fuel Cell Vehicles as a Sustainable Transportation Alternative: Environmental Impacts Assessment. *International Review of Civil Engineering (IRECE)*, *15*(6), 531. https://doi.org/10.15866/irece.v15i6.25574

Hersugondo, Wahyudi, S., & Laksana, R. D. (2025). Do Retail Companies in Indonesia Contribute to Sustainable Development Goals (SDGs) by Their Working Capital? *Journal of Lifestyle and SDGs Review*, *5*(1), e04350. https://doi.org/10.47172/2965-730X.SDGsReview.v5.n01.pe04350

Hienuki, S., Mitoma, H., Ogata, M., Uchida, I., & Kagawa, S. (2021). Environmental and energy life cycle analyses of passenger vehicle systems using fossil fuel-derived hydrogen. *International Journal of Hydrogen Energy*, *46*(73), 36569–36580. https://doi.org/10.1016/j.ijhydene.2021.08.135

Higueras-Castillo, E., Singh, V., Singh, V., & Liébana-Cabanillas, F. (2023). Factors affecting adoption intentiaon of electric vehicle: a cross-cultural study. *Environment, Development and Sustainability*, *26*(11), 29293–29329. https://doi.org/10.1007/s10668-023-03865-y

Hunjra, A. I., Bouri, E., Azam, M., Azam, R. I., & Dai, J. (2024). Economic growth and environmental sustainability in developing economies. *Research in International Business and Finance*, *70*, 102341. https://doi.org/10.1016/j.ribaf.2024.102341

Husein, L. A., Mushtaha, E. S., Alsyouf, I., & Obaideen, K. (2025). Advancing SDGs with IoT: Enhancing thermal comfort and energy efficiency- A bibliometric study. *Sustainable Futures*, *10*, 100873. https://doi.org/10.1016/j.sftr.2025.100873

Ikhsani, K., Catur Widayati, C., & Endah Retno Wuryandari, N. (2021). Analisis Pengaruh Persepsi Resiko, Promosi, Dan Kepercayaan Merek Terhadap Niat Beli Pasca Covid-19. *Jurnal Bisnis, Ekonomi, Manajemen, Dan Kewirausahaan*, 81–90. https://doi.org/10.52909/jbemk.v1i1.31

Ismiyati, I., Marlita, D., & Saidah, D. (2024). Pencemaran Udara Akibat Emisi Gas Buang Kendaraan Bermotor. *Jurnal Manajemen Transportasi & Logistik (JMTRANSLOG)*, *1*(3), 241. https://doi.org/10.54324/j.mtl.v1i3.23

Kraithong, N., & Poungjinda, W. (2025). Thailand's Implementation from Entering the Members of United Nations Framework Convention on Climate Change 1992. *Journal of Posthumanism*, *5*(4). https://doi.org/10.63332/joph.v5i4.1135

Kumar, B. A., Jyothi, B., Singh, A. R., Bajaj, M., Rathore, R. S., & Berhanu, M. (2024). A novel strategy towards efficient and reliable electric vehicle charging for the realisation of a true sustainable transportation landscape. *Scientific Reports*, *14*(1), 1–22. https://doi.org/10.1038/s41598-024-53214-w

Li, B., Li, B., Deng, J., Gao, H., Li, Z., Xiao, Y., & Shu, C.-M. (2024). Study of greenhouse gas emissions from smoldering coal fires: Estimation considering the indirect greenhouse effect of precursors. *Journal of Cleaner Production*, *443*, 141113. https://doi.org/10.1016/j.jclepro.2024.141113

Lu, Y., Shao, M., Zheng, C., Ji, H., Gao, X., & Wang, Q. (2020). Air pollutant emissions from fossil fuel consumption in China: Current status and future predictions. *Atmospheric Environment*, *231*, 117536. https://doi.org/10.1016/j.atmosenv.2020.117536

Martins, F., Sitchinava, T., Keryan, T., Mitrofanenko, A., Stefanelli, N., & Guigoz, Y. (2025). Sustainable Tourism and in the South Caucasus. *Sustainable Development*, *33*(4), 4867–4883. https://doi.org/10.1002/sd.3371

Matenda, F. R., Raihan, A., Zhou, H., & Sibanda, M. (2024). The influence of economic growth, fossil and renewable energy, technological innovation, and globalisation on carbon dioxide emissions in South Africa. *Carbon Research*, *3*(1). https://doi.org/10.1007/s44246-024-00155-8

Mathur, A., Nayak, A., & Kumar, N. (2025, June 16). *Low-Cost Mobile Hydrogen Refuelling Stations: A Cost-Effective Solution for India's Sustainable Transportation*. https://doi.org/10.4271/2025-01-0187

Mehlawat, M. K., Kannan, D., Gupta, P., & Aggarwal, U. (2025). Sustainable transportation planning for a three-stage fixed charge multi-objective transportation problem. *Annals of Operations Research*, *349*(2), 649–685. https://doi.org/10.1007/s10479-019-03451-4

Nugroho, J., Maharani, N., & Aprianto, R. (2025). Dampak Persepsi Keuntungan Dan Karakteristik Individu Terhadap Minat Pembelian Sepeda Motor Listrik : Literature Review. *Jurnal Ilmu Pengetahuan Sosial*, *12*(5), 1957.

Nurzakiah, S., Nurmalina, R., & Tinaprilla, N. (2025). Analysis of Demand and Competition for Indonesia's Eel in the International Market. *Agro Bali : Agricultural*

p-ISSN: 2085-9643 DOI: 10.26740/jaj.v17n2.p.484-497
e-ISSN: 2502-6380 https://journal.unesa.ac.id/index.php/aj

Journal, *8*(2), 553–564. https://doi.org/10.37637/ab.v8i2.2048

Olaleye, I. A., Mokogwu, C., Amarachi Queen Olufemi-Phillips, & Titilope Tosin Adewale. (2024). Innovative frameworks for sustainable transportation coordination to reduce carbon footprints in logistics. *International Journal of Science and Technology Research Archive*, *7*(2), 068–075. https://doi.org/10.53771/ijstra.2024.7.2.0068

Pamungkas, H., Darsono, D., Supriyadi, S., Padmaningrum, D., & Jumanto, J. (2024). An SDG-11 Sustainable Great Mosque Community: A Convergence Model to Consider. *Journal of Lifestyle and SDGs Review*, *5*(1), e04290. https://doi.org/10.47172/2965-730X.SDGsReview.v5.n01.pe04290

Pizlo, Z., & de Barros, J. A. (2021). The Concept of Symmetry and the Theory of Perception. *Frontiers in Computational Neuroscience*, *15*. https://doi.org/10.3389/fncom.2021.681162

Ragadhita, R., Fiandini, M., Al Husaeni, D. N., & Nandiyanto, A. B. D. (2025). Sustainable Development Goals (SDGs) in Engineering Education: Definitions, Research Trends, Bibliometric Insights, and Strategic Approaches. *Indonesian Journal of Science and Technology*, *11*(1), 1–26. https://doi.org/10.17509/ijost.v11i1.86298

Raman, R., Nair, V. K., Shivdas, A., Bhukya, R., Viswanathan, P. K., Subramaniam, N., & Nedungadi, P. (2023). Mapping sustainability reporting research with the UN's sustainable development goal. *Heliyon*, *9*(8), e18510. https://doi.org/10.1016/j.heliyon.2023.e18510

Seesaard, T., Kamjornkittikoon, K., & Wongchoosuk, C. (2024). A comprehensive review on advancements in sensors for air pollution applications. *Science of The Total Environment*, *951*, 175696. https://doi.org/10.1016/j.scitotenv.2024.175696

Sugiyono. (2022). *Metode Penelitian Kuantitatf, Kualitatif, dan R&D* (2nd ed.). Alfabeta.

Supriadi, D., Iman, A. H., & Saputra, Y. (2024). Studi Intensi Pembelian Kendaraan Listrik pada Generasi-Z: Pendekatan Teori Perilaku Terencana yang diperluas. *EKOMABIS: Jurnal Ekonomi Manajemen Bisnis*, *5*(01), 83–98. https://doi.org/10.37366/ekomabis.v5i01.1444

Thangamani, J., Ismailgani, R., & Arunagirinathan, K. (2025). Toward sustainable transportation: Experimental insights into Chlorella vulgaris algae biodiesel with titanium oxide nano-enhancements. *Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering*, *239*(4), 2283–2294. https://doi.org/10.1177/09544089241277707

Tjiptono, F. (2019). *Strategi Pemasaran Prinsip & Penerapan*. Andi Offset.

Uda, C. N., Philips, A. I., Clement, H. N., Orede, O. M., & Aliegu, H. F. (2024). Impact on Greenhouse Effect of the Heat Flow of the Earth Surface. *World News of Natural Sciences*, *53*(January), 32–48.

Ventura, L. M. B., Ramos, M. B., D'Agosto, M. de A., & Gioda, A. (2021). Evaluation of the impact of the national strike of the road freight transport sector on the air quality of the metropolitan region of Rio de Janeiro, Brazil. *Sustainable Cities and Society*, *65*, 102588. https://doi.org/10.1016/j.scs.2020.102588

Wang, C., Wood, J., Wang, Y., Geng, X., & Long, X. (2020). CO2 emission in

transportation sector across 51 countries along the Belt and Road from 2000 to 2014. *Journal of Cleaner Production*, *266*, 122000. https://doi.org/10.1016/j.jclepro.2020.122000

WHO. (2021). WHO global air quality guidelines. *Particulate Matter (PM2.5 and PM10), Ozone, Nitrogen Dioxide, Sulfur Dioxide and Carbon Monoxide*, 1–360.

Wicaksono, S. A., Huboyo, H. S., & Samadikun, B. P. (2024). Analisis Faktor-Faktor yang Mempengaruhi Pertumbuhan Kendaraan Listrik di Pulau Jawa sebagai Upaya Pengurangan Emisi Gas Rumah Kaca. *Jurnal Serambi Engineering*, *9*(1), 8133–8139.

Xiao, G., Wang, Y., Wu, R., Li, J., & Cai, Z. (2024). Sustainable Maritime Transport: A Review of Intelligent Shipping Technology and Green Port Construction Applications. *Journal of Marine Science and Engineering*, *12*(10), 1728. https://doi.org/10.3390/jmse12101728

Yustiarini, D., Soemardi, B. W., & Pribadi, K. S. (2025). Integrating Multi-Stakeholder Governance, Engineering Approaches, and Bibliometric Literature Review Insights for Sustainable Regional Road Maintenance: Contribution to Sustainable Development Goals (SDGs) 9, 11, and 16. *Indonesian Journal of Science and Technology*, *10*(2), 367–398. https://doi.org/10.17509/ijost.v10i2.85038

Yusuf, M. (2022). Pengaruh Promosi, Gaya Hidup, dan Persepsi Risiko terhadap Niat Beli Motor Listrik menggunakan Metode SEM - PLS. *G-Tech: Jurnal Teknologi Terapan*, *6*(2), 241–248. https://doi.org/10.33379/gtech.v6i2.1685