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MORALITY BEFORE KNOWLEDGE

Public interest in the energy transition: Exploring the shift to two-wheeled electric transportation for sustainable development

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ABSTRACT

Background: Energy plays a vital role in global efforts to transition toward renewable energy sources, addressing climate change and ensuring sustainability. Despite growing investments in renewable energy, fossil fuels remain a critical commodity, particularly in Indonesia's transportation sector, where their dominance significantly contributes to air pollution. The urgency to shift from fossil fuels to renewable energy has been heightened by geopolitical events such as Russia's aggression, which has underscored the need for energy resilience. Indonesia has initiated fiscal and non-fiscal incentives to promote the adoption of electric vehicles (EVs) as an environmentally friendly alternative. **Methods:** This research adopts a qualitative approach, conducting interviews with two respondents: one who owns an electric two-wheeler and another who does not. The study focuses on key factors influencing societal behavior and interest in transitioning to EVs, including price, infrastructure, brand, mobility needs, and environmental awareness. Government policies such as subsidies and tax incentives are also analyzed for their role in encouraging EV adoption. **Findings:** The interviews reveal that price affordability, infrastructure availability, and government subsidies significantly influence the decision to transition to electric vehicles. While environmental awareness is a contributing factor, practical considerations such as mobility needs and vehicle brand preferences remain critical. The study highlights the importance of government support in the form of improved infrastructure, subsidy programs, and standardized battery regulations to accelerate the adoption of two-wheeler EVs. **Conclusion:** The findings emphasize the need for targeted government policies to strengthen EV adoption, particularly through subsidies, infrastructure development, and regulatory improvements. These efforts are essential for achieving clean and sustainable energy in Indonesia. **Novelty/Originality of this article:** This study provides a comprehensive perspective on the socio-economic and policy-related factors influencing EV adoption in Indonesia. By incorporating first-hand insights from users and non-users of electric vehicles, it offers unique recommendations to enhance the transition toward renewable energy.

KEYWORDS: renewable energy; electric vehicles; government policy; societal behavior; sustainable transportation.

1. Introduction

Energy is the capacity to perform work or cause changes. It is typically categorized into two main types: renewable and non-renewable energy. For many years, non-renewable sources, such as fossil fuels, have been relied upon, but these resources are finite and will eventually be depleted. In Romania, fossil fuels and coal continue to be the primary sources of electrical energy (Paraschiv, 2023). However in the next few decades, there will be energy

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transition from fossil fuels to renewable energy (Elie et al., 2019). This shifting is based on a belief of the potential of renewable energy and to mitigate climate change and energy security (Ferrer et al., 2018).

During the last decade there was an investment increment in renewable energy sector. Figure 1 will show the growth of renewable energy sector. Figure 1 shows the trend of investment in renewable energy from 2013 to 2018 based on data from IRENA (2020). The graph illustrates the amount of funding allocated to various renewable energy sources, including solar PV and solar thermal, hydropower, biomass, biofuels, onshore wind, geothermal and marine energy. In general, investment in renewable energy fluctuated over the period, with peaks occurring in 2015 and 2017, where the value of investment exceeded USD 300 billion. The graph also shows that solar PV was one of the sectors that received the largest investment compared to other energy sources. This data reflects the shifting global trend in energy investment towards more sustainable energy sources. Increment can be seen from the dominance of wind and solar power plant, each investment about 29% and 46% of world's renewable energy investment (IRENA, 2020). Even so renewable energy transition is already start their momentum, fossil fuel is still an important commodity (Lang & Auer, 2020).

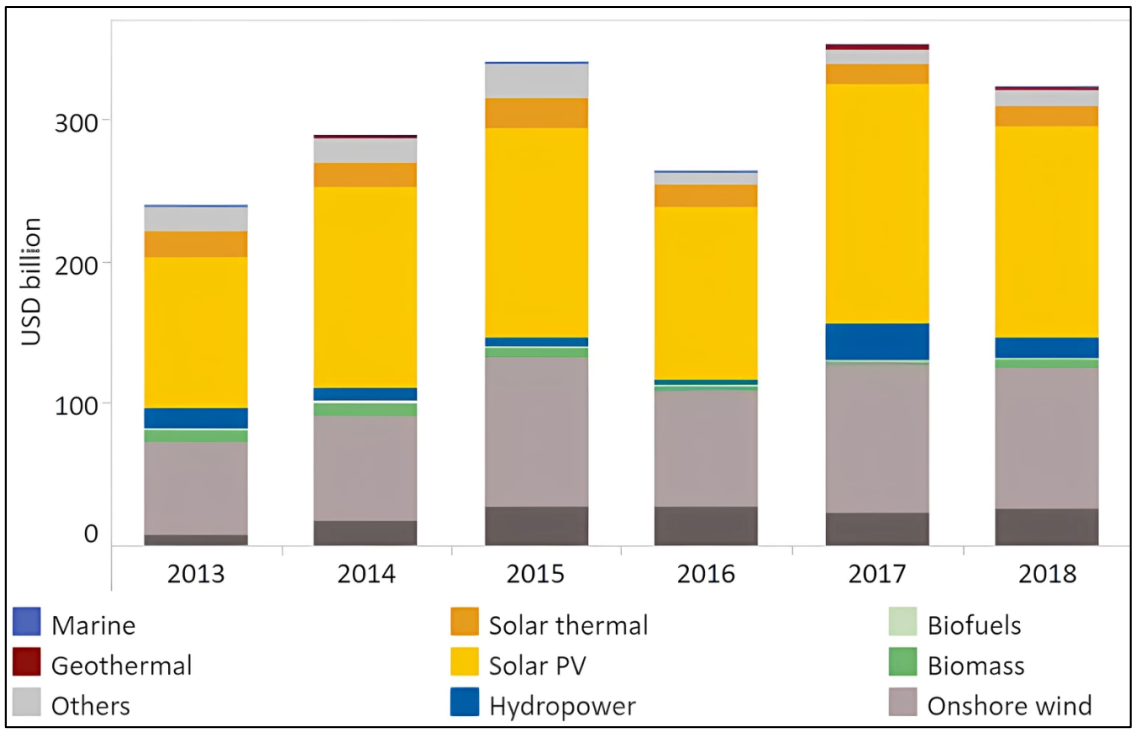

Fig 1. Investment of renewable energy
(IRENA, 2020)

Due to Russia aggression to Ukraine is giving uncertainty in energy sector. As one of biggest oil and gas exporter in the world, many countries are depending on Russia for their energy's fulfillment, so this is an advantage for Russia from the energy's ownership side (Stulberg, 2017). Hence to increase energy resilience renewable energy transition is needed sooner (Rodríguez-Fernández et al., 2020).

A research that has been done by Igeland et al. (2024) gave result that shown the stock of renewal energy nowadays becoming an interesting investment's option, especially in context of increment geopolitical tension. The result highlighting the significant potential role from renewable energy resource in order to strengthen energy's independence of a country or area. In the period of high geopolitical tension, can be seen that investment in renewable energy can be a strategic option that give a competitive primacy. This trend gives a clear strategic direction to decision maker to take a proactive action to promote renewable energy. This strategy not only helping to reduce dependency to traditional energy,

especially during geopolitical crisis, but also will give significant contribution to increase national's energy resilience.

Non-renewable energy such as fossil fuels is still a dominant usage in Indonesia. Data from Kakorlantas Polri stated that as much as 68,207 of 157,484,407 vehicles in Indonesia are electric vehicle per September 2023. Data from BPS in 2020 showed there was increment in the usage of fossil fuels for two wheeler of passenger cars as shown in Figure 2. Increment happens every year except in 2020 during COVID-19. Figure 2 presents data on fossil fuel consumption in road transportation in Indonesia over the period 2015-2020, based on data from BPS (2022). The graph compares fuel consumption between motorcycles and passenger cars. In general, motorcycle fuel consumption showed an increasing trend from 2015 to 2019, peaking at 25.9 in 2019, before declining to 22.62 in 2020. Meanwhile, passenger car fuel consumption remained relatively stable, with a slight increase to 9.1 in 2019, before dropping to 7.95 in 2020. This data reflects the pattern of motor vehicle use in Indonesia, with motorcycles as the main contributor to fuel consumption compared to passenger cars.

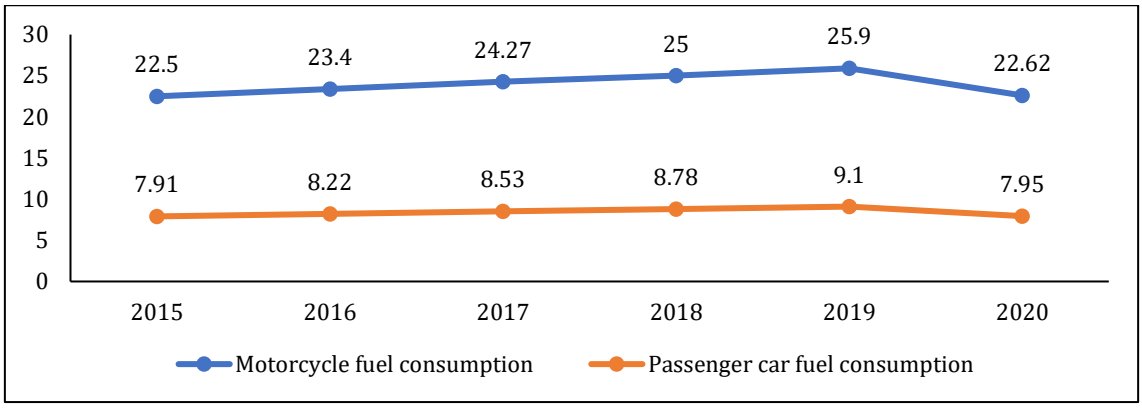

Fig 2. Usage of fossil fuels in Indonesia
(BPS, 2022)

Increment in the yearly usage of fossil fuels also affected to the increment of air pollution that caused by gas vehicle disposal and it has negative affect to health or environment (Degirmenci & Breitner, 2017). In 2009, Jakarta is in the top 6 city with the worst air quality in the world. However with the development of technology to renewable energy as alternative energy of fossil fuels as non-renewable energy can be a solution of the dependency to fossil fuel also eco friendly solution. Electric vehicle can be a promising chance to shift the dependency for vehicle that still use fossil fuels. Data from Ministry of Transportation and Ministry of Energy and Mineral Sources showed significant increment for electric vehicle in Indonesia.

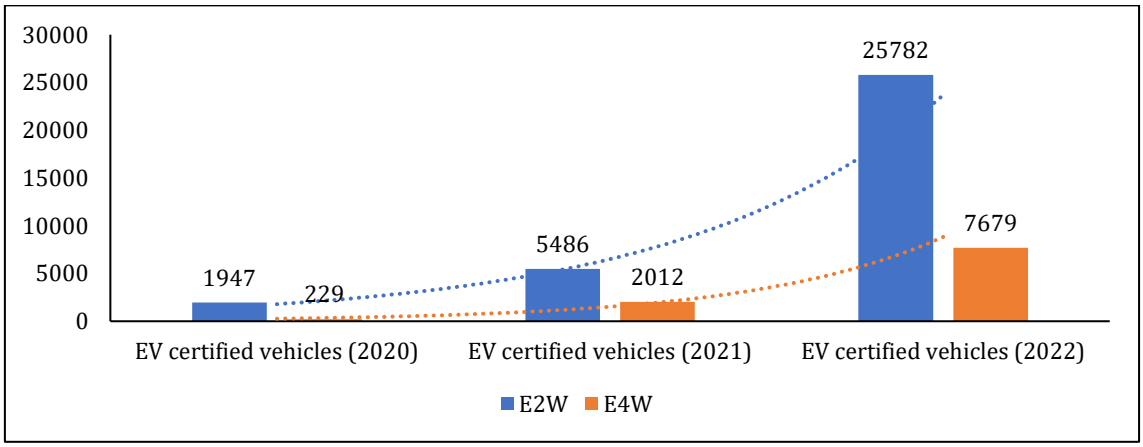

Fig 3. Number of vehicle with EV certificate

Figure 3 displays the status and target of electric vehicle (EV) adoption, with a comparison between electric two-wheelers (E2W) and electric four-wheelers (E4W). The data shows that the number of certified electric vehicles saw a significant increase from 2020 to future targets. Electric two-wheelers (E2W) saw a jump from 1,947 units to 25,782 units, while electric four-wheelers (E4W) increased from 229 units to 7,679 units. This trend reflects the rapid growth in electric vehicle adoption, along with increased awareness of green energy and government policies in support of transportation electrification.

In the past few years, there were significant increment of awareness about the negative impact that caused by vehicles with internal combustion machine to the environment. Main challenge in order to create cleaner and sustainable transportation is focusing on counter measure of the gas disposal and one of the program to reducing the usage of fossil fuels (Anshor, 2023). Combustion process of fossil fuels is creating gas emission that caused global warming and air pollution, hence, it is important to find a solution and application of alternative energy which is more eco friendly or known as green energy to prevent the negative effect to the environment (Aprili et al., 2023)

Indonesia Government in this part is supporting the transition of using alternative energy which is electric energy to replace fossil fuels by stating a policy Peraturan Pemerintah Nomor 55 tahun 2019. This policy is arranging to fasten the program of electric vehicle using battery for road transportation. Starting with fasten the development of electric vehicle, giving incentive, infrastructure and fee controlling, technical provision, also environment security already stated in this policy. Besides the policy to fasten electric vehicle programs, government also already released fiscal and non fiscal policy. Fiscal policy such as policy of Ministry on Monetary No 138 year 2021 about the expense of electric vehicle type test, policy of Ministry of Internal Affair No 1 Year 2021 about yearly tax expenses for electric vehicles, Policy of Government No 74 Year 2021 about the electric vehicle Luxury Goods Tax/*Pajak Penjualan atas Barang Mewah* (PPnBM) exemption, as well as Law No. 1 of 2022 regarding the exemption of Motor Vehicle Transfer Tax/*Bea Balik Nama Kendaraan Bermotor* (BBNKB) and Motor Vehicle Tax/*Pajak Kendaraan Bermotor* (PKB), is expected to be implemented by 2025. Non-fiscal policy such as from Ministry of Trading No 44 Year 2020 about the process of examination and certification for electric vehicle, President Instruction No 7 Year 2022 about the usage of electric vehicle as government's official vehicle also other technical regulations of electric vehicle. Indonesia is currently in energy transition phase in terms of transportation, Government Regulation Number 55 year 2019 has been becoming a base to change from using non renewable energy in this part about the usage of fossil fuel that keep increasing every year shifted to renewable energy in transportation sector which is electric vehicle.

2. Methods

Method of research that is being used is qualitative by using analytic descriptive design. The research data is gathered through a literature review and interviews, where participants are asked a series of questions. One of the main questions is about how factors such as the vehicle brand, infrastructure, price, mobility, and environmental concerns can influence their decision to switch to an electric two-wheeled vehicle. The discussion is further expanded and developed during the interview process. Source person is decided based on the ownership of two wheel electric vehicle. The objective of this research is to find the factor of dominance society behavior that can create energy transition. Result of this research is expecting to support the strategy of Indonesia Clean Energy.

Descriptive research is a research that use observation, interview and questioner regarding current condition. Literature study is being used as reference from scientific journal, research report, government policy, and official information that has been released. Those reference will be used by researcher in order to to do research as a reference to solve problem and also to add knowledge. Interview of this data collecting has been done to a group of millennial worker who live and work in Jakarta.

3. Results and Discussion

Eco-friendly vehicle is a type of vehicle that use alternative fuels and the impact of the usage does not harm the environment. Transformation from conventional oil fuel to eco-friendly fuel is one of the effort to reducing greenhouse effect and air pollution. By adopting greener fuels so that vehicle able to contributes to save the environment and it's negative impact (Putri et al., 2022). During the way to renewable energy, not only focusing on fulfillment aspect that usually relate to energy generator. In demand aspect, that involve very dynamic social factor, such as role of the society as the success decider or vice versa, as the main failure also has an important role that can not be ignored (Wardhana, 2020).

Consumer behavior is a study about steps that involved when an individual or group make decision to purchase, use or remove the product, service, idea or experience to fulfill needs and desire is an effort to understand deeply every act that they take in order to fulfill their needs and desire. It invaolves an analysis about the decision making process and the consumption act as a part of dynamic consumer behavior (Pramelani, 2023). Indonesia's government already tried to fasten the usage of electric vehicle technology as a program to reduce emission from fossil fuel vehicle by releasing PERPRES No. 55 year 2019 about the acceleration program of electric vehicle battery based for road transportation. Due to that regulation, also released another policy Peraturan Pemerintah No. 73 year 2019 that control selling tax of luxury items. The understanding of interest in buying refers to consumer's interest to an object that mark their willing in buying. The indicator of interest in buying that is used in this research include; interest of product, product's curiosity, intensity to try, intensity to buy and expectation to have the product (Putri et al., 2022).

Latest research that has been done by Putri et al. (2022) mentioned about life style, futuristic design and confidence giving positive impact to the interest of buying electric vehicle. Sample taken accordance to the objective of research. Interview has been done to two workers who has and does not has electric vehicle. First source person here is a worker who has regular mobility from home to the office, age category can be categorized as millennial. As for the second source person is a worker who has two wheel electric vehicle and regularly use it for mobilization from home to the office or for other daily use.

Table 1. Characteristic of source person for research

Source Person	Age	Occupation	Place of origin	Activity	Daily transportation	Ownership of electric vehicle
Source person 1 – Man	Millennial	Private employee	West Jakarta	Working	Motorcycle	Does not has electric vehicle
Source person 2 – Man	Millennial	Private employee	South Jakarta	Working	Motorcycle	Already had electric vehicle
Source person 3 – Man	Millennial	Private employee	Bekasi	Working	Motorcycle	Does not has electric vehicle
Source person 4 – Man	Millennial	Private employee	Central Jakarta	Working	Motorcycle	Does not has electric vehicle

Based on the interview with the first respondent, it was found that the regular activity involves working, and a fossil fuel-powered motorcycle is used. The respondent is already aware of the availability of electric vehicles from various brands. Then based on the observation result in South Jakarta office area, researcher found that there are two units of Battery swap station for public electric vehicle. The provision for battery charging and battery swap is an infrastructure that has to be provided for two wheels electric vehicle's owner. Source person 1 can find some SPBKLU during his mobilization from home to the office.

"As for two wheel electric vehicle, I personally has an interest to Brand Alva One based on the model that quite good and catchy ya however the price is a bit more expensive than other brands." (Source person 1)

"If we are talking about the brand, I'm more attracted to Smoot. I see it from the model and type of battery that is used. About the price, I think for now the price for electric vehicle and fossil fuels vehicle is not really different." (Source person 3).

"For electric vehicle, I am now interested to Gesit because it was the first brand that introduced in Indonesia's market and then another brands appear." (Source person 4).

"In order to swift to electric vehicle, I'm thinking about the simplicity to access the charging/swap location. Since I found that the unit is still too limited and the available swap facility is currently owned by a ride hailing platform. So, if there is any any electric vehicle that can afford to provide the simplicity surely we can consider to move to electric vehicle." (Source person 1)

"In my opinion, electric vehicle with swap battery is more convenient for me to use. Beside that, I see that for swap battery facility is now only provided by brand Smoot and already available in some supermarket in Jakarta so the willingness and consideration to buy electric vehicle will be bigger." (Source person 3)

"The consideration to buy electric vehicle is more to the charging access. If we can recharge the battery by ourselves without having to swap it is more interesting and convenient for me so when we arrive to the destination we can recharge it again." (Source person 4)

The usage of transportation is a supporting media for a person to travel/ mobilization demobilization so that a person can do their activity and or doing certain activity in life. Activity need from each individual can be divided into regular activity and non regular activity. For regular activity can be a special concern so the purpose of that regular activity can be achieved.

"Since my daily activity is more likely in the office, so my routine is going to work from home to the office with approximate distance 15km. Hence transportation is kinda important to support my routine." (Source person 1)

"Daily activity also include working distance 23km usually riding motorcycle, beside that for the other activity around the house is just to buy food of daily needs." (Source person 3)

"Just need it to go to the office and intercity mobilization, because in my opinion vehicle is actually needed to support regular activity. Also the distance from home to office is quite close so using electric vehicle can be an alternative for energy saving. Distance from home to office around 12km using motorcycle." (Source person 4)

As time by time, society activity also moving hence they need supporting infrastructure. All this time, Indonesian people tend to use fossil fuels vehicle which in this era becoming a serious concern since it gives negative impacts to the environment. Global warming is one of the example that now becoming a concern for all nations (Aprili et al., 2023). Combustion from oil fuels that currently happen in nowadays transportation resulted to gas emission that affected to the environment (Aprili et al., 2023). Hence, alternative energy program is actually needed and can be seen as of the solution that can reduce the effect of bad air quality (Yoesgiantoro et al., 2022).

"Talking about environment issue, that is not one if the factor that urge me to shift or buy electric vehicle. However, if we are talking about nowadays issue I do agree with you." (Source person 1)

"I also consider the vehicle's waste, especially to old vehicles or whether the vehicle is not regularly maintained so it will produce thicker smoke. Honestly I also consider that, maybe by using electric vehicle more or less I will be able to participate to reduce air pollution from fossil fuels vehicle, just

like we know electric vehicles tend to produce minimum sound and smoke. So we can not hear loudly the sound of it." (Source person 3)

"For environmental issue, I personally tend to consider about the function of electric vehicle but if we're talking about transitional matters, environmental issue is not the first thing that come up to my mind whenever I want to buy electric vehicle. Somehow I do agree that electric vehicle is one of the alternative effort to reduce air pollution from fossil fuels vehicle." (Source person 4)

Based on the second interview with the second respondent, it was found that electric vehicles are already being used for daily activities, such as commuting from home to the office. After further discussion during the interview session, similarities in viewpoints were identified regarding the challenges of adopting electric vehicles as a consideration for usage. The interview details are as follows.

"I bought this electric vehicle to shift from my latest motorcycle. I decided to buy Gesit because there was a subsidy from the government around 7 million rupiah so the price is still affordable for me. During my experience using this electric vehicle, for charging process I can put off the battery from the vehicle and I can do it simply using home electricity and I found it is quite convenience. As for battery capacity, claimed up to 60km so I think it is still fine for me to use it for my routine home to office as far 42km back and forth. At that time while I bought it, I also consider environmental issue as supporting factor." (Source person 2)

"I am still not fully into electric vehicle because I think the quality of electric vehicle still not apple to apple compared with fossil fuel vehicle. Charging feature, service station and Jakarta's traffic is not enough to support two wheels electric vehicle commodity." (Source person 1)

"During my time using electric vehicle, I am still quite worry and feeling inconvenience with the traffic, ups and down road, and this Gesit type, swapping battery is still not available, swapping facility that is available is SPBKLU is a facility that is used for partnership with ride hailing company." (Source person 2)

"Swapping battery access is one of the matter since for now the swapping station is still very limited based on the brand, each brand of electric vehicle has different type of battery so it will be great if if the swapping station has bigger space to provide the type of battery for each brands." (Source person 3)

"Vehicle's feature who has easier access and charging speed, since I consider it for daily needs, even if we only see from the distance is not that far but we all know that the daily traffic is also so bad hence we need the simplicity for charging feature that need to be build by the producer in the vehicle or provide the public charging facility for consumer." (Source person 4)

When considering the purchase of an electric two-wheeled vehicle, all three sources share the same view that price is a key factor in their willingness to switch from their previous vehicle. This is evident in the statements below.

"If you asked me the main priority for me to change to two wheel electric vehicle, the first one will be price, then infrastructure like the simplicity and the access to charge the battery, brand to ensure that the feature they offer to us can support my daily activity, as for environmental issue for me is not the main factor. I think if the market is bigger, having electric vehicle can be a trend for public." (Source person 1)

"Personally, when I buy this vehicle I will look up to the price, as I stated before I bought it because there was a subsidy from government for buying this brand. Beside that, the purchase I made was also to support my daily activity. For the third reason, Infrastructure to charge the battery also can be done at home, then for this brand is quite well known in Indonesia nowadays. As for environmental issue was not my main reason, however after I using it now I participate to reduce air pollution." (Source person 2)

> *"Talking about the plan to buy it, my first priority is price for me if we see it from every sides cost efficiency can be the highest compared to other aspects. We know that nowadays transportation is kind of primary needs since we regularly use it for daily activity to support personal mobility where I think private vehicle is much more efficient than public transport. Second aspect, I would see the infrastructure, then environmental issue, and the last one would be the brand."* (Source person 3)

> *"Firstly, I personally would consider the brand because the better brand should have better quality, the infrastructure to support it for daily use, and then about the price cause it will relate with the daily activity, and also environmental aspects to reduce air pollution."* (Source person 4)

Literature study and interview that has been done, there are some obstacle that caused the transition from fossil fuels to electric vehicle works slowly, such as first, high price of electric vehicle. High price is one of the obstacle that slower the transition from fossil fuels to electric vehicle in Indonesia (Sidabutar, 2020). The production process that is not proceed in Indonesia is also one of the factor that affect the high price. Imported spare part in this case is also one of the factor, the price of the battery that being used is also high, can be up to half of the price of the electric vehicle especially for two wheels electric vehicle. Second, worry of the distance. Limited distance also one of the obstacle during the electric vehicle transition (Liao et al., 2017; Maghfiroh et al., 2021; Marciano & Christian, 2020). The usage of electric vehicle has limited distance, this makes people reconsider it. Using the vehicle with uncertain distance make people worry either the battery will be fit for the distance or not. Third, limited model of electric vehicle. The other obstacle is the limited model of the vehicle (Haddadian et al., 2015). People's preference in assessing electric vehicle's model will compare it with fossil fuels vehicle, fossil fuels vehicle tend to have more variant. Electric vehicle that can not meet people's preference will also slower the transition.

A research in Malaysia, electric vehicle is already acknowledged widely as the best alternative in order to reduce greenhouse gas, consumer whom care more about the environment will adopt electric vehicle (Kumara, 2012; Adnan et al., 2017; Istiqomah et al., 2023). The relation between the subsidy or non renewal energy and environmental pollution shows the positive correlation (Solarin, 2020). A research that has been done before about country who use high subsidy of energy shows an increment tend of greenhouse gas 11.4% and uplift of CO_2 14,8% higher that those countries who apply higher tax (Arzaghi & Squalli, 2023). The transition of non-renewal energy to renewal energy in terms of electric vehicle is not only about the ways of it but also the education to the society. Society should be more educated about the environment. Environmental pollution, reducing greenhouse gas, air pollution, natural resources exploitation (fossil fuels) should be a learning issue for all society, so they can be more aware, understand and adaptable to the changing of renewal energy in this case about the usage of electric vehicle.

A research that has been done by Wang et al. (2018), using the method of questioner survey to collect data from 10 pilot cities in Tiongkok, with the purpose to explore the impact of knowledge of electric vehicle, the risk, the advantages, and the financial incentive policy to consumer's willingness to buy electric vehicle. The result of this research confirmed that there is positive impact from the knowledge of electric vehicle and the perception of it's advantages, also the negative impact from the risk perception towards consumer's willingness to buy electric vehicle. However, current financial incentive policy does not have significant impact to the willingness to buy. Also in this research also indicate that the lack of knowledge about electric vehicle and the perception of the high risk also can be a psychological obstacle for them to acknowledge electric vehicle. The discovery in this research also give contribution to our understanding about the consumer's behavior to adopt electric vehicle and give important implication to practitioner to motivate consumer to buy electric vehicle.

This research has been done by Abbasi et al. (2021) said that even the supply of electric vehicle (EV) is available in the market, the main challenge is to increase the consumer's demand to this technology. Electric vehicles, as a symbol of modern technology, have significant potential to reduce carbon emissions in the transportation sector. To achieve

this, wider global acceptance is necessary. Currently, electric vehicles still need to gain more popularity and broader consumer acceptance. The importance of increasing the knowledge and consumer's awareness towards electric vehicle is still very shallow. Even the technology is available, many consumer still have not fully understand of it's advantages and probably having uncertainty about the performance, cost or charging infrastructure. Because of that, sustainable effort is needed to improve consumer's knowledge and to motivate them to choose electric vehicle. Company and government's institution are the key lead to support the increment of this knowledge. Effective marketing strategy and counseling campaign can help to improve consumer's knowledge about electric vehicle. Besides that, financial support and incentive from government, such as lower tax or purchase incentive will be able to motivate consumer to choose electric vehicle. In context of Master plan of Green technology 2030 and the purpose of sustainability development, increase the motivation and consumer's acceptance towards electric vehicle become very important. The success in achieving target to reduce carbon emission is depending on the adoption of vehicle with low emission. By spreading maximum environmental knowledge towards consumer, can increase positive perception and motivation to choose electric vehicle, which somehow will help to create sustainable vision in transportation sector.

Research that has been done by Santos & Davies (2020) based on 143 response from the experts and stakeholders in Germany, Austria, Spain, Netherland and England that has been collected from March 2015 to July 2016, this study identified to incentives that most respondents think it is important to support the usage of electric vehicle. Respondents were asked to reflect the impact of the incentives in their places of origin. But there are some cases where the incentives were not applicable yet. In that situation, some respondents said that they unable to see the impact since the incentive is not applicable yet, while other respondents also said that the impact will rise if the incentive is applicable. Different approaches from respondents may lead to inaccurate conclusions, particularly when calculating the percentage of respondents who are confident that the incentive will have a positive impact once implemented. By considering the variable of respondent's approach, this study conclude that four main incentives that give significant impacts are the development of charging infrastructure, purchasing subsidy, trial/ demonstration, and tax incentive. By focusing on these factors, this study gives detail pictures about the element that can be main support to increase the adoption of electric vehicle in some countries that become the focus of the research.

The analysis that has been done by widening the data base regarding electric vehicle's policy that has been collected during period 2010-2015 by Wee et al. (2019) in some part of America, include data from 2016-2018, while modifying data set to record the date of the policy. Econometric panel methode with effect is still used to sorting out factors such as environment, demography, politic and ideology that can be the cause of changing for electric vehicle's policy in states. Some states that applied different policy for electric vehicle using battery (BEV) and plug in electric vehicle (PHEV), the analysis has been done separately to each sample. The result of the research showed that environmental ideology and political situation of a state is the main factor that support the electric vehicle policy is states. States with the participant that more care to the environment tend to have purchasing subsidy for electric vehicle using battery (BEV) and plug in electric vehicle (PHEV). Also, countries that managed by Democrat and Republic is more possible to apply subsidy for home charging. On the other side, states with higher traveling amount tend to not interested for purchasing subsidy but more interested for home charging subsidy. Somehow interesting that variable like greenhouse emission per capita, local air pollution, and economy indicator such as increment of unemployment does not have correlation with the application of electric vehicle's supporting policy in states. However, that variable can still be relevant when explaining the yearly cost of an electric vehicle. States with participant who does not really care with environment, lower unemployment and higher dependency to fossil fuel's tax is more possible to have yearly electric vehicle's cost. Overall, this research conclude that economy politics of electric vehicle's policy in states of America include complex interaction

between state's politics, ideology, structural factor, and environmental cost that caused by the usage of fossil fuels in each states.

The policy implementation that has been released by the government, fiscal and non fiscal incentive can be done together to support the adoption of electric vehicle in larger scale (Wati et al., 2023). Fiscal incentive such as tax free, discount of the electric vehicle price or free installment of charger device in electric vehicle can be a stimulant to the society. Non fiscal policy such as installment of charger device in public space, separate parking specifically for electric vehicle in public space, traffic limitation or priority road can be another attractiveness for society.

Result of the research and interview that has been done and literature study about the transition to electric vehicle is one of an effort to reduce air pollution caused by the smoke of vehicle where nowadays numbers of motor vehicle is much more than other vehicle. First, price affect the public's interests. Public's tendency to buy two wheel electric vehicle is economical factor which is early investment or operational, public loves the concept of saving money when purchasing something or doing long term maintenance, electric vehicle also has lower kilometer cost compared to fossil fuel's vehicle. Second, infrastructure affect the public's interests. Talking about the technology, public is interested to charging facility that give confidence to public either they have to choose it or not. Wider charging station and fast charging technology will be able to accommodate public's fear of the distance so it will be more convenient for public to mobilize. The importance of charging infrastructure and the energy security highlight that this transition needs collaboration from all sectors. Changing of paradigm is not only about electric vehicle as transportation but also as a bigger movement to more eco-friendly and sustainable life. Third, technology's offering by brand affects public's interest. The importance of comfort and driving experience can not be ignored in terms of public's interest to electric vehicle. Along with more brand that offers primacy in vehicle's usage so it will be more interesting for public. Features like instant acceleration, smart integration, voice controller and riding experience become a satisfaction to users also a domino effect from the changing of public's life style.

Fourth, mobilization's activity trigger the demand. Public's mobilization appear as a very important supporting factor in order to guard energy transition from conventional vehicle that currently use fossil fuels to electric vehicle. This phenomenon is not only creating changes in public's behavior, but also rise up the demand of innovation and greener solution in transportation's sector. Transportation's sustainability not only becoming an individual responsibility but also the whole community, include promotion of electric vehicle's usage, creating atmosphere where electric vehicle considered as an integral part of public's daily mobility. This kind of mobilization's activity able to create public's interest and trigger the demand of electric vehicle.

Fifth, environmental issues. The impact of emissions from fossil fuel-powered vehicles has been a major focus in discussions about pollution. However, based on the interview results, it appears that this is not a significant factor for the public when considering the purchase of electric two-wheeled vehicles. Environmental issue risen up as a direct effect that can be feel from the usage of electric vehicle with zero emission so it gives positive contribution to environmental issue as an eco-friendly answer. In some research, awareness of the environmental effect of greenhouse emission that produce by fossil fuels has become a main motivation for public who is interested into energy transition. Electric vehicle, with zero emission is considered as the best solution to reduce individual's carbon trace. Beside that, strict policy and regulation about the emission of conventional vehicle can encourage public's interest to find greener alternative for the environment. Based on the result from literature data, explained that public's awareness towards environment can give significant effects to public's interest of electric vehicle. The result indicated that higher public's awareness of environment, the higher also public's interest to buy electric vehicle, the better public's perception to electric vehicle and it will trigger the demand of electric vehicle as a main alternative.

Even though, public's interest to two wheel electric vehicle keep rising, there are still some challenges that need to be solved. Electric vehicle's safety and the worries about the

battery durability still becoming an attention. Infrastructure's support still need to be improved in the dense cities to ensure the availability in all area. Electric vehicle with sophisticated battery's technology and expensive electronic component tend to have higher price than fossil fuels vehicle, so government's incentive program is needed and subsidy to resolve the pricing issue as a supporting factors that affected public's interest to find more economic electric vehicle. Subsidy program and tax incentive will give significant economy support to the public such as discount or tax reduction can be a supporting initiative from the government.

4. Conclusions

The most dominant factors that can encourage people to shift to more eco-friendly fuels are price, infrastructure that supports user convenience and safety, brand reputation that highlights key features, the need for mobility between locations, and environmental concerns. In Jakarta, environmental awareness is currently limited. In the millennial era, using an electric vehicle is not only about transportation but also a lifestyle trend. Interest in switching from fossil fuels to electric vehicles is also influenced by government policies, such as subsidies, making it more affordable for consumers.

Given these factors, the government plays a crucial role in implementing subsidy programs to improve access to electric two-wheeled vehicles. This includes reconsidering tax policies to reduce costs for consumers, improving infrastructure to increase the availability of charging stations, and ensuring easy access to electric vehicle battery stations. It is also hoped that the government will review the standard operating procedures for batteries used in electric two-wheel vehicles. Furthermore, infrastructure access should be as convenient as refueling fossil fuel vehicles, with more fuel options available at gas stations. Since this study is limited to the South Jakarta area, future research could expand the scope of respondents.

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Author Contribution
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