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Indonesia's Incentive Policies on Electric Vehicles: The Questionable Effort from the Government

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ABSTRACT

This study seeks to solve the problems in the development of electric vehicles in Indonesia and focuses on incentive policies with related theories compared with other countries. As an effort to realize an environmentally friendly industry, electric vehicles have become a global trend for states to develop, including in Indonesia. Electric vehicles as new discourse in Indonesia needs great support from the Government. In 2022, Indonesia itself targets the first production of domestic electric cars. In 2025, electric cars in Indonesia are targeted to reach 20% of the market. In this case, the Indonesian Government has sought to provide incentives for accelerating the development of electric vehicles through President Regulation Number 55 of 2019 regarding the Acceleration of the Battery Electric Vehicle Program for Road Transportation. However, this policy has not yet become a trigger mechanism for the public to switch to electric vehicles. The determinant factor for this adversity would be; there is a lack of incentives offered by the Government that can be obtained by the consumers. The author finds that the incentive policy provided through Government Regulation is still questionable because it has not been able to trigger the public to switch to electric vehicles.

Keywords: Energy, Electric Vehicle, Incentives, Transportation, Indonesia

JEL Classifications: K4, R5

1. INTRODUCTION

As an effort to realize an environmentally friendly industry, the current global trend is shifting from conventional energy sources to other energy sources that are more environmentally friendly. The main reason is the everlasting impact that greenhouse gas emissions have caused (Schmid, 2017. p. 3). The existing environmental data shows that the transportation sector is the fastest growing greenhouse gas emissions source by 71% since 1990 (Ge and Fredeich, 2020). As we know, most of our transportation burns fossil fuels that emit carbon dioxide, which is a greenhouse gas that is a significant cause of global warming and the climate crisis. Indonesia is also one of the ten countries that produce more than 68% of global greenhouse emissions. One of the reasons is because the automotive sector is one sector that is a priority for the Indonesian industry. In 2017, vehicles sales reached 1.07 million vehicles with a sales growth of 4.9%

(Purwadi, 2019. p. 3). As a state with one of the biggest motor vehicle users, that makes Indonesia have contributed to a large amount of carbon dioxide emissions.

However, the use of fossil fuels in 2037 is predicted to decrease, and as much as 50% will be replaced by renewable energy (Doan et al., 2019). Renewable energy has begun to be widely used, for example, in a power plant. According to the Renewables 2019 Global Status Report, current renewable energy has already contributed more than 33% to existing power plants worldwide (REN21, 2019, p. 41). Moreover, electricity is one of the solutions being pursued by states to lower pollution and greenhouse gas emissions. It is because electricity can be generated with renewable energy sources, such as water, wind, solar, and geothermal. With this trend, the hope is that dependence on fossil energy can increasingly be reduced. Conversely, no pollution radiates as electricity is converted into heat energy, chemistry or mechanical,

so electric cars are often regarded as a “zero emission” vehicle and its use is widely seen as a final solution to the pollution problem. It is also the primary justification why Indonesia needs to apply technology with renewable energy, especially for motor vehicles immediately.

It is discovered that electric vehicles (EVs), which consist of plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs), are seen as an effective way to reduce greenhouse gas emissions from light-duty vehicles/LDV (cars, sport-utility vehicles, and pickup trucks) (Harvey, 2020. p. 1-11). He further explained that the potential exists to reduce the energy intensity of gasoline-powered vehicles using hybrid electric vehicles (HEVs) by 55-75% in city driving and by 35-65% in highway driving compared to the 2015 conventional vehicles. International Energy Agency in the Global EV Outlook (2019) reports the growth of electric cars today has experienced rapid development since the last ten years, with 5 million units in 2018. As many as 2.4 million units or 45% of them are in China. The aforesaid report also reveals that national policies play an important role in encouraging the electric vehicles' development; this is usually done by providing incentives for vehicles that have low emissions.

Unfortunately, the development of electric vehicles in Indonesia is slower than in other states. The suspected problems are namely; the low purchasing power of the community towards electric vehicles and companies in the vehicle sector are still having contemplations in developing BEVs in Indonesia. The emergence of doubts from entrepreneurs is always related to national policies and concepts to technical policies. In addition, there is the insufficient public infrastructure from the Government to support the development of electric vehicles. Asserting the aforesaid fact, incentives must be at the forefront of stimulating people to switch to electric vehicles. For the infrastructure, Indonesia itself does not have exact data on the number of uses of national electric cars. However, according to the Head of the Regional Revenue Agency (*Bapenda*) there are only 699 units of electric vehicles in Jakarta only that registered with the DKI Jakarta Bapenda, as of January 2020 (Ravel and Maulana, 2020). Also, it cannot be forgotten that Indonesia's lack of experience in motor vehicle electrification. Indonesia has not much experience switching to hybrid electric vehicles, yet used to phase-based battery-based electric vehicles. Hybrid vehicles, such as the Hybrid Electric Vehicle (HEV) and the Plug-In Hybrid Electric Vehicle (PHEV), can be a transitional period for Indonesia to face vehicle electrification. Bob Azam from Toyota Motor Manufacturing Indonesia stated that this hybrid car could popularize environmentally friendly vehicles and are more affordable than BEVs (Indra, 2019). Based on research conducted by the Lembaga Penyelidikan Ekonomi dan Masyarakat Universitas Indonesia, respondents are still worried about BEV's technical problems such as how to charge when the battery runs out. (Hafiyyan, 2019). Meanwhile, infrastructure in Indonesia is not evenly distributed. Therefore, the type of hybrid car is more into people's preferences than the BEV.

Despite the adversities, there is still great potential for implementation in Indonesia. Electric vehicles have become more

prominent in Indonesia since the Government launched the Making Indonesia 4.0 program. Furthermore, The Indonesian Ministry of Industry said that Indonesia has great potential to develop electric-based vehicles, and target production to begin in 2022 (Nangoy, 2019). Indonesia also hopes that EV production will start in 2022 and that the share of electric vehicle output will reach 20% of total vehicle production by 2025 (Silviana and Suroyo, 2019). Also, in 2025, the government has set a target of using 2,200 electric vehicles for four-wheelers and 2.1 million for two-wheeled vehicles (Radhi, 2019). The Indonesian Government has sought to provide incentives for accelerating electric vehicles' development through President Regulation Number 55 of 2019 regarding the Acceleration of the Battery Electric Vehicle Program for Road Transportation. There are 17 incentives that can be provided by the Government, both fiscal and non-fiscal incentives.

However, comparing the target in 2025 and the schematic problem, the incentive scheme in the aforesaid Government Regulation cannot yet be the answer. Based on these discussions, this paper will discuss two research questions: (1) What are the problems and incentive policy schemes in the development of electric vehicles in Indonesia? and (2) How is the readiness of Indonesia's infrastructure for the electric vehicle target market?

2. METHODS

This research uses normative legal research methods. This method conducts legal research by examining existing library materials. This paper will also be discussed based on legal theories. Thus, these assumptions will also be tested and linked based on legal theories. The data used are secondary data and analyzed based on a statutory approach. The data includes the literature, including those available online. Also, this study uses legal material, including Indonesian law related to the Electric Vehicle, books, articles/journals, seminar papers, dictionary. The data is then presented descriptively and systematically in this paper.

3. RESULTS AND DISCUSSION

3.1. Incentive Policy Scheme Implemented by Indonesia

3.1.1. Legal mapping of incentives policies

The policy regarding battery-based electric motorized vehicles is one of the national energy policies. Indonesia has a certain legal framework for regulating national energy policies. One crucial point that is regulated is the attention to the use of renewable energy and energy conservation. The concern in question is the existence of provisions that have been set specifically about the conveniences provided by the Government. The facilities include the provision of incentives or administrative convenience.

Law Number 30 Year 2007 concerning Energy is a law that covers all forms of energy supply and utilization, including renewable energy. Incentives and facilities for renewable energy use are mentioned in Article 20 paragraph (5) and Article 21 paragraph (3). The incentives can be in the form of capital, taxation, and fiscal assistance. From Law Number 30 Year 2007 concerning

Energy, two Government regulations related to energy use were issued, namely:

3.1.1.1. Government Regulation No. 79/2014 concerning National Energy Policy.

The provision relating to the incentives for electric motor vehicles is Article 22. It stipulates that the central Government and regional Governments provide fiscal and non-fiscal incentives to encourage the diversification of energy sources and the development of renewable energy. Also, the Government provides incentives for private institutions or individuals who develop core technologies in new energy and renewable energy.

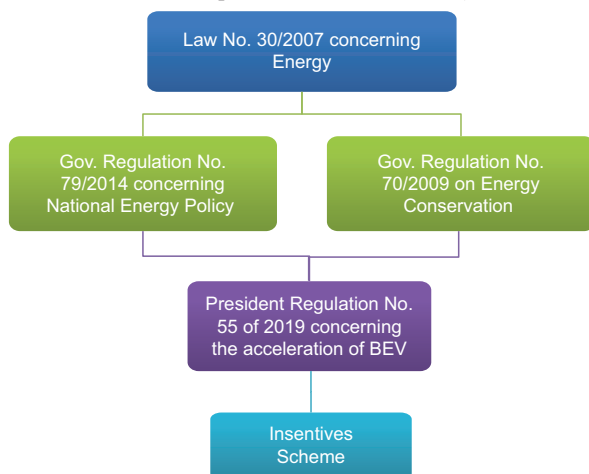
3.1.1.2. Government Regulation No. 70/2009 concerning Energy Conservation.

Articles 17 and 18 stipulate that the central Government and regional Governments provide incentives to domestic producers of energy-saving equipment who are successful in carrying out energy conservation as well as energy users who use energy greater than or equal to 6000 (six thousand) equivalent tons of oil per year.

After that, on August 12, 2019, another derivative regulation was born that discussed specifically related to BEV through Presidential Regulation No. 55 of 2019 concerning the Acceleration of the Battery Electric Vehicle Program for Road Transportation (the BEV Regulation). If we map it, there are 3 levels of regulation in developing BEV, starting from the level of Laws, Government Regulations and Presidential Regulations. Details can be described Figure 1.

The BEV Regulation becomes a form of Indonesia's commitment to reduce greenhouse gas emissions, so it is necessary to accelerate the BEV program for road transportation. This regulation provides directions for accelerating BEV, one of which is by using an incentive-giving scheme. Interestingly, incentives are the topic most frequently highlighted because they are considered a trigger

Figure 1: Legal Mapping of Incentives Policies (Republic of Indonesia, 2007; Republic of Indonesia, 2014; Republic of Indonesia, 2009; Republic of Indonesia, 2019)



Source: Law number 30 year 2007; Government regulation number 79 year 2014; Government regulation number 70 year 2009; President regulation number 55 year 2019

mechanism for BEV development. As regulated in Article 17 paragraph (3) of the aforesaid regulation, the incentives provided include 17 incentives. In detail, the list of incentives can be classified as follows in Figure 2:

3.1.2. The issue towards the incentives policy schemes

The above explanation can give a picture that incentive policy seems to have a structured legal framework. Moreover, the timeline for accelerating its development has been determined by

Figure 2: List of Incentives (Republic of Indonesia, 2019)

No	Fiscal Incentives (Article 19)	Non-fiscal incentives (Article 20)
1	Incentives for import duty on the import of BEV;	Exclusion from restrictions on the use of certain roads;
2	Sales tax incentives on luxury goods;	Delegation of production rights for technology related to BEV whose patent license has been held by the Central Government and/or Regional Government;
3	Incentives for exemption or reduction of central and regional taxes;	Fostering security and/or securing the industrial sector's operational activities to sustain or smooth logistical and/or production activities for certain industrial companies that are national vital objects.
4	Import duty incentives on the import of machinery, goods, and materials for investment purposes;	
5	Postponement of import duties for export	
6	The Government bears import duty incentives on the importation of raw materials and/or supporting materials used in the production process;	
7	Incentives for building a charging station;	
8	Export financing incentives;	
9	Fiscal incentives for research, development, and technological innovation activities as well as industrial vocational BEV components;	
10	Parking rates at locations determined by the Regional Government;	
11	Reduction of the cost of charging electricity at charging station;	
12	Support for financing the infrastructure and development of charging station;	
13	Professional competency certifications for human resources of the BEV industry;	
14	Product certification and/or technical standards for BEV industry companies and BEV component industries.	

Source: President regulation number 55 year 2019

the Government with the momentum of the issuance of the BEV's presidential regulation. From a legal-formal perspective, the Indonesian Government has committed to providing opportunities for the development of this BEV. However, we must dissect further whether the substance in these regulations has provided space for the opening of the BEV development effort.

3.1.2.1. Lack of incentives for consumers

If detailed, the incentives stipulated in Article 17 paragraph (3) of the BEV Regulation are aimed at three main groups, namely: (1) The company, including BEV company and BEV component industry company, battery leasing and waste management company, charging stations provider company; (2) Research institutions, including colleges research and development institutions; (3) Consumers who use BEV. The distribution of incentives that may be obtained by each group as follows in Figure 3:

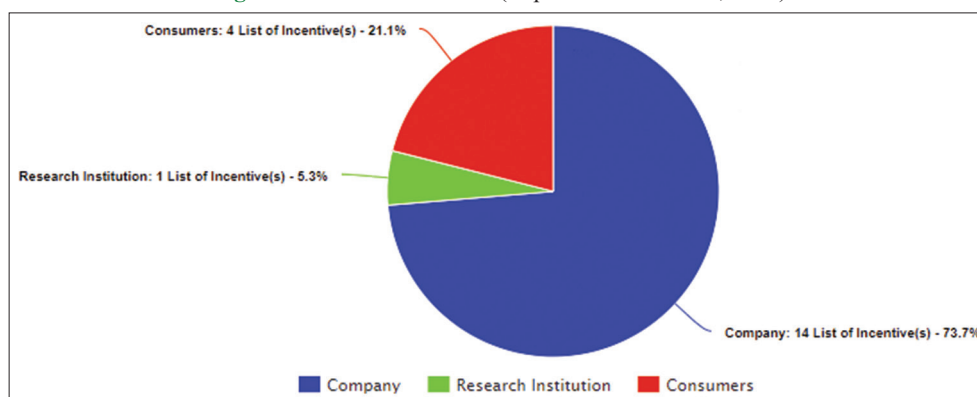
Based on this kind of division, the sectors directly involved in the electric vehicles industry have been accommodated as part of the aim of providing Government incentives. In this arrangement, companies are the group that is given the most incentives. It is recorded that from the 17 regulated incentives list, company groups have the potential to get 13 incentives. Meanwhile, for consumers, only four lists of incentives and research institutions only one list of incentives. It shows that the convenience for consumers is fairly small. Consumers are the main point in creating new markets related to BEV. The real fiscal incentive that consumers will get is the exemption from certain taxes, such as taxes on luxury goods. As mentioned in article 17 paragraph (3) letter k of the BEV regulation, the incentives provided are only for consumers or individuals using BEV. Thus, there will be no incentive policy in the form of subsidized vehicle prices. It is unfortunate because incentive policies that can reduce purchasing cost of EVs such as, purchasing subsidy and purchasing tax exemption, are more powerful than others especially when some incentive policies only cater to specific groups (Li et al., 2019, p. 4). Therefore, the main problem is the exclusivity of the BEV itself. It is coupled with the price of one BEV unit, which is still relatively high compared to conventional. The policy of cutting or subsidizing prices has been implemented in various countries and is one of the central policies carried out, like China, the United States, and France. (Volkswagen, 2020).

- a. China uses an incentive mechanism in the form of exemption from certain restrictions. Electric vehicles are not subject to registration restrictions or driving restrictions on certain days, which apply to vehicles with combustion engines in major Chinese cities
- b. The United States, using the mechanism of tax bonuses or tax exemptions. When buying an electric car, all federal taxes that depend on fuel consumption are eliminated
- c. France uses a mechanism of incentive subsidies for every purchase of electric vehicles. The maximum amount that can be subsidized is 8.500 Euros per electric vehicle purchase.

Based on the adoption of electric vehicles across countries, the role of incentive policies amidst the adoption of BEVs is important. It is proven in the United States that the relationship between the adoption of EVs and policies has achieved notable success through the increase of EVs sales as there are policy packages of financial incentives that entertain potential consumers (Zhang et al., 2014, p. 8069-8070). An interesting financial incentive from the United States would be the Car Allowance Rebate System, which is an act with a \$3 billion financial incentive where people would get \$3500 or \$4500 if they exchanged their less fuel-efficient vehicle for a higher fuel-efficiency vehicle (Zhang et al., 2014, p. 8061). The importance of the relationship between the adoption of EVs and policies also applied to China as it included government subsidy, purchase tax exemption, dedicated license plate, parking benefits, and infrastructure construction subsidy as its incentive policies along with its adaptation of electric vehicles (Li et al., 2019, p. 8). These incentive policies were implemented in China based on its analysis in the cities of China that every additional 1% increase in government subsidy increased the market share of electric vehicles by 0.435% (Li et al., 2019, p. 13-14).

In conclusion, cutting prices can be a step to reduce the level of exclusivity of the BEV itself. The Government's focus on production is important, but creating markets is more important. How will it be when the production is massive, but the people's purchasing power is still lacking. On the one hand, the Government needs to provide the potential consumers of BEVs more information about the advantages and disadvantages of these vehicles and assist people to get more insight about the reason why adoption of BEVs is important (Langbroek et al., 2016, p. 103). If the Government

Figure 3: Incentives Holders (Republic of Indonesia, 2019)



Source: Authors based on president regulation number 55 year 2019

highlighted those points, the gap between people's interests to purchase BEVs will likely to increase. On the other hand, when implementing incentives, the BEV unit price cuts must also be carried out selectively. It means providing incentives must also consider the financial capacity of the BEV unit buyer. Consumers who have good financial backgrounds do not get incentives. So that the incentives are right on target, this is intended to save Government funding for BEV incentives. The role of the market is the key to the success of the Government's target in 2025.

3.1.2.2. Controlling the conventional vehicles

When planning BEV arrangements for road transport, the policy should have thought far ahead. The problem is that this presidential regulation is too focused on BEVs, while the restrictions on conventional vehicles are slightly regulated. Article 16 of the BEV Presidential Regulation has regulated the control of the use of oil-fuelled motorized vehicles (conventional vehicles); this control is gradually carried out based on the road map for the development of the national motor vehicle industry. It is not explained in detail how the control will be carried out.

The choice of BEVs in the electric vehicle industry does not necessarily make producers and consumers switch. They must have a compelling reason to switch to BEVs. It is because conventional vehicles have become a convenience for Indonesian people today. They need cost and benefit considerations when choosing BEVs. The Government must form a policy that imposes restrictions on conventional vehicles, namely by providing disincentives.

The provision of disincentives is intended for users of energy sources who do not implement energy conservation, for example, written warnings; the requirements for business or vehicle ownership are further complicated; revocation of business licenses for the vehicle industry that does not implement the green energy plan; reduction of oil stations (SPBU); and others. The provision of disincentives is one of the strategies stipulated in the Government Regulation on Energy Conservation. This scheme should also be adopted in the BEV Presidential Regulation. Thus, for the BEV industry, on the one hand, the Government makes it easy for BEV companies/users, while on the other hand, the Government also provides losses if they still use conventional vehicles. The combined strategy of incentives and disincentives hopes to stimulate willingness from users to switch to BEVs.

3.1.2.3. Incentive provisions require more technical regulations

Some of the incentives contained in the BEV Presidential Regulation still need more technical derivative regulations to be implemented, for example, related to tax exemptions. Exemption from luxury goods tax and vehicle transfer fee tax requires regulations at the ministerial level and at the regional level. Meanwhile, until now there are only two regulations at the regional level that regulate BEV related: (1) Governor of Jakarta Regulation Number 3 of 2020 concerning tax incentives for transfer of name transfer fees for BEV specifically in the Province of Jakarta; (2) Governor of Bali Regulation Number 48 of 2019 concerning on the Use of Motor Vehicles Battery Based. These two governor regulations deserve appreciation because they have supported the implementation of the BEV Presidential

Regulation. However, Indonesia has 32 other provinces that still have no discourse on developing BEVs. Thus, a lot of support from the local Government is still needed. Regulations at the technical level need to be formed immediately because the transition for 2025 requires various adjustments.

The implementation of the BEV Presidential Regulation also faces obstacles from the industrial sector. For domestic car manufacturers, they are confused about which BEV models to market in Indonesia. The central government has not released technical instructions and implementation instructions related to BEV development (Medikantyo, 2020). Technical guidelines and implementation guidelines are seen as the Government's first step in providing direction for producers in presenting BEVs. We know that BEV and environmentally friendly technology are new things in Indonesia. There is still a lot of research and regulatory refinement that needs to be done by the Government. Incentives as the main promotion by the Government should be ready to be implemented. In fact, if Indonesian government and policymakers are adamant to achieve air quality standards and transport decarbonization by producing a mass adoption of BEVs, they need to design policies that can support BEVs once large-scale subsidies are removed (Breetz and Salon, 2018. p. 248). Thus, the government regulation does not only think about how the incentives are used for the use of BEV, but furthermore regarding the conditions after the BEV is widely used. However, looking at some of the problems above, improving regulations and guidance from the Government in incentives seems to be an important consideration in welcoming 2025.

3.2. The Readiness of Indonesia's Infrastructure Towards the Electric Vehicle Market Target

The adoption of electric vehicles demands complementary services to maintain the electric vehicles themselves. Therefore, it is vital to ensure that there is a complete and supporting infrastructure to develop electric vehicles. The infrastructure generated from applying electric vehicles into the market is the readiness to build charging stations and road infrastructure to support electric vehicles. It is revealed that other than behind price and driving range, not having enough access to charging stations is a major barrier for consumers to purchase electric vehicles (Engel et al., 2018). It is also a major drawback for Indonesia, which has targeted its electric vehicle output will reach 20% of total vehicle production by 2025.

There are many challenges that Indonesia has to face to pursue its electric vehicles ambitions. First and foremost, electric vehicles are still luxury goods that can only be purchased at least from upper middle class despite its environmentally friendly nature. It has hindered the growth of electric vehicles in Indonesia. Secondly, the fact is that conventional vehicles run because of fossil fuels, and electric vehicles run because of battery. Consequently, there needs to be an appropriate amount of charging stations to make the electric vehicles run. There are also several issues about having battery to run electric vehicles such as limited distance, battery prices that are costly and inconvenient because battery charging is relatively long (Sirait, 2020). Also, there is a high voltage needed on electric vehicles, and it is a barrier to the

burden of power for electric vehicle owners (Mufrod, 2019). Having that in mind, electricity suppliers would need to foresee the long-term investments needed to respond to the global trend of electric vehicles (Menecon Consulting, 2012, p. 3). Thirdly, other than the battery issue, there is also a smart grid issue for electric vehicles' maintenance. A smart grid is an electricity network that includes a suite of information, communication, and other advanced technologies for the control and management of transport of electricity from all generation sources to meet the varying demands of electricity consumers (Menecon Consulting, 2012, p. 8). Smart grid systems for battery charging stations and fleet management systems also require more funds to maintain and manage (Sidabutar, 2020, p. 28). Applying smart grid is an essential part of electric vehicles because coordinated charging is the most appropriate and valuable strategy for electric vehicle network owners and operators (Sidabutar, 2020, p. 29). In conclusion, charging stations and related infrastructure remain a challenge because the electric car market's concentration or enthusiasm is still not too high.

The Indonesian government needs to continually be reminded that diverting demand from fuel to electricity will create a significant increase in electricity demand on a large scale (Aziz et al., 2020, p. 53). In order to tackle this, there needs to be strong cooperation between the electric car industry, electricity companies, and the Indonesia Government. In regards to all of the three issues above, it can be concluded that the most significant barrier towards the readiness of Indonesia's infrastructure is funding and limitations from the Government. As it turns out, there is a standard of equipment and materials that may hinder foreign investment in renewable energy projects such as the electric vehicle infrastructure (UMBRA, 2020). The limitations of these equipments and materials in Indonesia are called Local Content Requirements or *Tingkat Komponen Dalam Negeri* (TKDN) (UMBRA, 2020). TKDN is the amount of domestic content on goods, services and a combination of goods and services to support Indonesia's local development. It is stipulated in Article 7 of the BEV Presidential Regulation that Central Government and Industry Companies can conduct research, development, and industrial technology innovation of Battery Electric Vehicles as long as there is a high TKDN achievement. Specifically for the Battery Electric Vehicles program, the Government requires TKDN for two or three-wheeled vehicles to be at least 40% in 2019 to 2023 (Mola, 2019). The TKDN level increases to a minimum of 60% in 2024-2025, and a minimum of 80% in 2026 (Mola, 2019). In regards to the four or more wheeled business actors, the TKDN is at least 35% in 2019 - 2021, then increases at least 40% in 2022-2023, up to 60% in 2024 and 80% in 2030 (Mola, 2019). Therefore, with a high standard and expected high achievement, it can be said that the development of electric vehicle infrastructure might have to take a little bit longer. There is no guarantee that the Government can produce battery electric vehicles or accommodate its infrastructure domestically while fulfilling the TKDN's standards.

However, there are several signs of progress in implementing the complementary services of electric vehicles from the Government. In March, Minister of Finance Sri Mulyani Indrawati declared a new luxury tax scheme designed to encourage greener cars

production (Silviana and Suroyo, 2019). The plan also includes eradicating luxury tax for electric vehicles and a low rate for hybrid cars. Mufrod (2019) explains that the Indonesian Government, through the State Electricity Company (PLN), provides attractive offers for consumers who want to add electricity powers to their homes. Through this program, the Government offers discounts for customers who will make additional electrical power ranging from 220 VA to 197 kVA. The discount categories are ranging from 50% to 100%; this is a non-public infrastructure facility to develop the future of electric cars in Indonesia. Moreover, PLN as a state-owned electricity producer has prepared Public Electric Vehicle Charging Stations (SPKLU) at several points in Jakarta. These charging stations have also been extended to Bandung and South Tangerang (Astutik, 2019). In its statement, PLN stated its ability to build infrastructure and provide electricity supply for electric cars in support of the Indonesian Government's electric vehicle target in 2025 (Gaikindo, 2015). PLN has experienced providing electricity facilities for mass transportation of electric trains, thus making PLN more confident towards the development of electric vehicles.

4. CONCLUSIONS

There are Questionable Efforts from The Government Towards the Incentives Policy. The legal framework for developing BEV in Indonesia already exists. However, there are problems in incentive policies that make it difficult to form a BEV business ecosystem shortly, due to:

1. Lack of incentives for consumers
2. Lack of control over conventional vehicles
3. There is still a need for various technical regulations or regional Government regulations to support the presidential regulation on BEV.

With the national target of production in 2022 and market share in 2025, there are still many BEV infrastructures in Indonesia. These include charging stations, road infrastructure, and smart grids that have not been truly developed because the Indonesian citizens still have a massive reliance on conventional vehicles. If there is no progress on the development of BEV in Indonesia, our greenhouse emissions will not decrease; thus it would worsen our environment. With the global trend of switching to renewable energy, Indonesia cannot risk abandoning BEV with its current incentives policy. Otherwise, there would be condemnation from other notable states that have conducted their best to innovate and moved on towards a new and renewable energy transition.

The suggestions that we can give are:

1. In terms of regulations, the central Government refines the presidential regulation on BEV and immediately forms technical regulations, such as regulations at the ministerial level and also provincial regulations
2. From an infrastructure perspective, the Government must immediately focus on encouraging the development of BEV infrastructure in Indonesia, especially in industrial-based provinces
3. Indonesia needs to do more research to know the obstacles to the development of electric vehicles and how to overcome them.

In addition, research is also needed for infrastructure arrangements and a substantial incentive policy. Besides that, Indonesia is not a country that fully supports research development compared to other countries in the world or in the ASEAN region with countries that have the same economic level as Indonesia. In the ASEAN region, Indonesia is still far below that of Singapore, Malaysia, Thailand, and Vietnam. Therefore, there needs to be more research about increasing the production of electric vehicles, a substantial incentive policy, and infrastructure arrangements.

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