



Electric Vehicle Battery: Natural Environment and Social Environment in Indonesia

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ABSTRACT

The world has experienced significant changes in the field of energy transition, one of which is in the automotive sector. Vehicles are now starting to increase in variety under the name electric vehicles. Electric vehicles are predicted to be the answer to excessive use of fossil fuels. Indonesia is one from many countries that has declared to adapt. However, the use of battery as a power source for electric vehicles will expand the problems of implementing good laws, the natural environment and the social environment. This research uses a normative juridical approach with secondary data with aim to find answers about how electric vehicles battery affects natural and social environment in Indonesia. Electric vehicles require the full support of policy makers, stakeholders and society and must continue to prioritize sustainability. In fact, Indonesia is not ready legally, in the natural and social environment to implement electric vehicles, especially from the point of view of electric vehicle battery. In-depth scientific studies are needed to carry out a perfect transition that does not cause harm to all parties. Even though the realization of low emissions is a common ideal that must be realized, law, nature and humans must not be put aside.

Keywords: electric vehicles, battery, Indonesia

1. INTRODUCTION

Large dependence on fossil fuels does cause problems, especially in gas emissions. That is why automotive technology in the world continues to improve over time. One proof is the transition from conventional fossil fuel vehicles to electric vehicles. This has been agreed upon by several countries in the world which aim to achieve Net Zero Emissions by 2060 [1].

Many studies treat energy security and Net Zero Emissions as separate concepts, instead of using Net Zero Emissions as a lens for assessing a country's energy security. Using Net Zero Emissions as a basis for addressing energy security issues is critical to helping countries not only decarbonize their energy systems, but also to reduce geopolitical dominance over energy resources. In Indonesia, most energy security research has focused on unlocking the country's vast renewable energy potential [2].

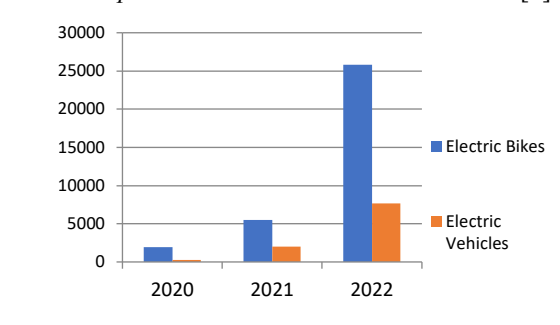
Electric vehicles are vehicles that use one or more electric motors or traction motors as their driving force. A pure electric vehicle is a vehicle that only uses electrical energy to move and the electricity it uses is obtained from an external source [3]. They are completely fuel-free. The driving mode relies entirely on lithium-ion battery power. Energy is replenished by relying on the power lines from several charging stations. They are projected as to reduce emissions and energy consumption [4].

However, it also brings new dynamics to Indonesia's natural environment, where there are still many puddles of water, mounds of land, roundabouts and curves. Electric vehicles must be designed to deal with the unexpected situations especially when on the road. On a very special note, electric vehicles use battery as the main power source. Battery in general requires chemical ingredients extracted from nature. With this logic, battery for electric vehicles require large amount of them.

Indonesia as one of the countries that has agreed to Net Zero Emissions agreement to increase the transition towards environmentally friendly industries and to reduce carbon emissions, creates more competition in the automotive world to update electric-powered vehicle technology. Based on sales research from manufacturers to distributors in Indonesia, the number of electric vehicles has reached 2,176 units in 2020. This number increased

significantly to 33,461 units in 2022 [5]. Then, in 2021 and 2022 electric vehicles gain more popularity as shown below.

Graphic 1 Electric Vehicles in Indonesia [6]



Source: databoks.katadata.co.id

The regulation for electric vehicles in Indonesia is regulated in Presidential Regulation Number 55 of 2019 concerning the Acceleration of the Vehicle Program Battery Based Electric Motor is not enough because it is not environmentally friendly, especially in terms of mining for raw materials for electric vehicle battery. The availability of fossil fuels such as oil, natural gas, and coal is decreasing day by day, while human needs for energy in the form of fuel are increasing. The supply of petroleum reserves is decreasing due to the uncontrolled use of fuel, especially due to the rapid growth in the use of vehicles for transportation. The impact of the use of this fuel oil causes air pollution caused by exhaust emissions that can pollute the environment and harm health. One of the efforts currently being made is the use of alternative energy as fuel for transportation. One of the efforts to use alternative energy is the use of battery-based electric motor vehicles. The government through Presidential Regulation No. 55 of 2019 concerning the Acceleration of the Battery-Based Electric Motor Vehicle Program for Road Transportation encourages Universities to conduct Research, development and innovation for battery-based electric motor vehicles. Electric vehicles are vehicles that are driven by an electric motor, using electrical energy stored in batteries [7].

Electric vehicles cycle consists of battery composition, battery recycling and resources management. So does the area used in Indonesia is suitable and good for hosting mining activities? Will the waste and disposal results from mining activities be managed properly? If these two things cannot be fulfilled, it will open up opportunities for failure in both natural environment and social environment.

Based on the results of several previous studies from Cakrawati Sudjoko, the discussion focuses more on battery materials and the supply chain for electric vehicles in Indonesia [8]. Anggoro Fajar Gandajati and Luh Putu Mahyuni focused more on the views of gen y in the development of electric vehicles in Indonesia [9]. Meanwhile this research will focus on abot how electric vehicles battery affects natural and social environment in Indonesia through law and legal basis..

2. METHODS

This research uses a normative juridical approach and described analytically. The legal materials used in this research are primary legal materials especially Presidential Regulations and also secondary legal materials, namely various scientific papers [10].

3. DISCUSSION

a. The Legal Side Of Electric Vehicles

There must be justice in terms of law. As we look out on both natural environment and social environment aspects, there must be:

- 1) Flexible justice, namely the smart concept of electric vehicles must also have a smart impact on the natural and social environment;
- 2) Cosmopolitan justice, namely emphasis on gas emissions and massive use of resources for humanity
- 3) Restorative justice, that is, there must not be low, poor or bad standards for social environmental compensation for the use of the natural environment because there will definitely be groups of people who will be affected. Restorative justice also means moral and financial balance which must be responsible for optimizing each stage.

That is why the energy transition in the natural environment must go hand in hand with social environmental processes in society. This is called just energy transition. At this point, the role of law makers is very necessary to

create justice and equality as well as a balance of profits and expenses. In this way, environmentally sound practices will be created while still paying attention to compensation for those affected, high respect for indigenous peoples and providing open access to provide the best services, not green colonialism [11].

b. Energy inequity

- 1) Regarding distribution, it must be fair, benefiting all parties;
- 2) Regarding procedures, stakeholders and law makers must be involved;
- 3) Regarding technology regarding the equal rights of local communities;
- 4) Regarding cosmopolitans, they must prioritize humanity;
- 5) Regarding restorative, it must create an energy sector that is moral and financially continues to seek compensation for the negative impacts caused;
- 6) Regarding flexibility, we must be open to the energy transition solutions offered.

c. Electric Vehicle Battery

Low capacity battery are not good for electric vehicles and high capacity battery are good for electric vehicles but are not good for the environment because they require large amounts of resources, which can worsen the natural and social environment. A pure electric motor vehicle is a vehicle that only uses electrical energy to move and the electricity it uses is obtained from an external source. The things that must be paid attention in terms of this are as follows:

1) Resource Utilization and Processing

The main resources are lithium and nickel whose extraction process has several bad impacts on the natural environment such as global warming, large reductions in resources, toxicity to the environment and most importantly bad impacts on human health.

2) Manufacturing is a process of combining extracted resources which can have an impact on human health because lithium very easily causes skin inflammation. Then large resources mean requiring large land and factories so that they will also have a large impact on the natural environment and economy.

3) Distribution

The operation of electric vehicle battery is for 10 years.

4) Waste and disposal

Known as Recycle Reuse Waste. All three involve the economy, so there must be stability in battery production to minimize financial risks. In this process, metal materials are broken down to make recycled battery. Policy regarding used battery because they are dangerous metals for humans, plants and animals. Laws and standards must be established to improve enforcement of the law itself and clarify the responsibility for creating safe technology for all and that is called good management [11].

d. Electric Vehicle Battery Mining

Means the mining of nickel and lithium. Very often located in areas that should be protected, such as nature preserves. The impact caused:

- 1) Human health;
- 2) Biodiversity;
- 3) Water consumption;
- 4) Energy intensity;
- 5) Indigenous peoples: Ignorance of decisions that impact their lives; opportunity to get a job;
- 6) Natural resource extraction is prioritized in areas that do not impact indigenous communities.

Electric vehicles in Indonesia actually is a commitment to reduce carbon emissions and prevent the continuous use of fossil fuels. The first legal framework regarding this matter namely Presidential Regulation Number 55 of 2019 concerning the Acceleration of the Vehicle Program Battery Based Electric Motor still considered as weak on the environmental side because it focuses more on the industrial side. In 2030, it is targeted that there will be 2 million electric vehicles as the peak of the energy emissions sector. It cannot be denied that procuring electric vehicles requires high costs from financial and social aspects, which means that it really requires public trust and support. The legal basis must first be socialized widely and evenly in order to create a supportive ecosystem because changes in the environment can not only be seen but also felt. The balance between humans and the environment is important to regulate and maintain. Indonesia is the largest nickel producing country in the world [12][13][14].

Law Number 32 of 2009 concerning Environmental Protection and Management is the main legal basis for managing electric vehicle battery waste, because it regulates the obligation to manage hazardous and toxic waste (B3) resulting from human activities, including from the industrial and technology sectors. Article 59 stipulates that every person who produces B3 waste is obliged to manage the waste they produce, and Article 60 prohibits the

disposal of B3 waste into environmental media without permission. In addition, Article 69 states that violations of this provision may be subject to administrative, criminal or civil sanctions. This law also underlines the importance of using environmentally friendly technology and encouraging recycling practices to reduce negative impacts on the environment. This law ensures that battery waste is managed safely and sustainably, minimizing risks to the environment and human health. [15]

However, Presidential Regulation Number 55 of 2019 concerning the Acceleration of the Battery-Based Electric Motor Vehicle Program does not specifically regulate articles related to environmental protection or battery waste management. Most of the contents of this regulation focus more on developing the electric vehicle industry, reducing imports of fossil fuels, and incentives for electric vehicle producers and consumers. Therefore, there are no articles that directly regulate environmental protection or battery waste management in this regulation. [16]

Presidential Regulation Number 55 of 2019 focuses on the energy transition or electrification of motorized vehicles, such as cars, public transportation, and motorbikes in Indonesia, to immediately no longer use power from fossil fuels, but use electrical energy whose main driver is the battery. The type of battery is Lithium which is made from Nickel. In realizing this policy, the government requires that the production of battery-based electric vehicles must use domestic components, as stated in Article 8 of Presidential Regulation Number 55 of 2019. The domestic components for producing battery-based electric vehicles referred to in the article are Nickel. This is because nickel is the main raw material for batteries for electric vehicles as the main source of power. In this case, nickel is one of the mining materials in Indonesia in large quantities. Indonesia is the country with the first place in nickel production in the world [17].

The government's target in accelerating the battery-based electric motor vehicle program has not reached its seriousness. The government's policy on electric motor vehicles cannot stand alone because it requires other derivative regulations. These regulations can be in the form of implementing instructions and technical instructions from Presidential Regulation Number 55 of 2019. The relevant ministries have 1 year or until August 2020 to issue these regulations. Unfortunately, approaching the fourth anniversary of the issuance of the Government Regulation, there are no signs that this regulation has begun to be discussed with industry players. In fact, this regulation is very much needed to provide legal certainty in the development of the electric car industry in Indonesia [18].

There must be environmental justice in air, water and land. The nickel mining has a very negative impact on fish populations because it will change the fish's habitat, namely water into pools of mud. The waste products will contaminate. The area in Indonesia with the highest demand for nickel mining is Obi Island, where the condition is now very unsuitable for natural life because it has been badly damaged. Making electric vehicle battery requires very large amounts of nickel. The Mining Law in Indonesia which was issued in 2020 is considered problematic and does not support human rights [19].

We need to underline that in fact the two keys to people's lives in Indonesia are maritime and agricultural, namely fishermen and farmers. If the natural environment cannot be utilized for these two things because it is contaminated, then Indonesia's original and true values have been lost. This situation also has a huge impact on the lives and work safety of fishermen and farmers [20].

4. CONCLUSION

Based on the things described above, it can be concluded that Indonesia is not ready legally, in the natural and social environment to implement electric vehicles, especially from the point of view of electric vehicle battery. In-depth scientific studies are needed to carry out a perfect transition that does not cause harm to all parties. Even though the realization of low emissions is a common ideal that must be realized, law, nature and humans must not be put aside.

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