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Novel Renewable Energy as Resources for Environmentally Friendly National Energy Security: The Existence and the Readiness of the Regulatory Framework

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ABSTRACT

Carbon gas emissions that come from the use of non-renewable energy have a bad impact on the environment. So, comes the idea of transforming Novel Renewable Energy as the main energy source because it is more environmentally friendly. This is a challenge for Indonesian. Because Indonesia has the potential for Novel Renewable Energy which can be utilized as the main source of national energy security. For the proposal to be successful, it must be accompanied by qualified regulations. However, the problem today that Indonesia does not have specific independent rules regulating Novel Renewable Energy. The purpose of this paper is to analyze the potentials of Indonesian's Novel Renewable Energy as an alternative to the main source of national energy security. Besides, it is also to analyze legal support so that the environmentally friendly Novel Renewable Energy optimization program has the right legal basis. The research method in this paper uses normative research methods. The research approach of this paper uses a conceptual approach related to Novel Renewable Energy. The results show that Indonesia has big potential for Novel Renewable Energy as the main source of national energy security. So the environment-friendly Novel Renewable Energy will be realized as a source of national energy security.

INTRODUCTION

The role of energy in the modern era today has a position that cannot be separated from all community activities. Because the position of energy is very important, there is a national energy security policy. So that energy needs in the community are still fulfilled. This is a source of the smooth operation of all community activities from the fields of education, socio-culture, and economy.

National energy demand is currently dominated by non-renewable energy as a source of energy security. The energy sources consist of oil: 52.50%; Gas: 19.04%; Coal: 21.52%; and the rest is renewable energy (Kholiq, 2015). This data shows that national energy needs still depend on non-renewable energy sources. And the utilization of renewable energy potential in Indonesia is very minimal which should be an alternative source of energy security. Dependence on non-renewable energy has complex problems for the country. It is undeniable that currently, oil production is decreasing. Data from the Ministry of Energy and Mineral Resources of the Republic of Indonesia states that the amount of oil reserves is only sufficient for about 10 (ten) years. Then followed by sufficient gas reserves in about 20 (twenty) years (Liputan 6.com, 2020). And the national coal supply is also expected to run out in 2035(Arthur Simatupang, 2015). If there is no progressive action, it is undeniable that in the future energy demand in Indonesia will be scarce. Not to mention the threat of environmental damage due to exploitation activities that have not yet been maximally resolved.

It is time to optimize new and renewable energy as an alternative to the main source of energy security to prevent problems in the energy sector. Moreover currently, Indonesia is in the 6th (six) position of the largest contributor to carbon emissions in the world (Suwignyo, 2020). This problem can be one of the problems that can be solved by optimizing renewable energy. Environmentally friendly energy will be part of sustainable development (Jaelani, Firdaus, & Jumena, 2017). If it is done optimally, it cannot be denied that the position of the top 6 (six) Indonesia as a contributor to carbon gas emissions will soon be the biggest. This can happen through the transformation of renewable and environmentally friendly sources of energy security.

In act. No. 30 of 2007 concerning Energy, renewable energy is one of the parts regulated in this regulation. In act. No. 30 of 2007 concerning Energy, renewable energy is one of the parts regulated in this regulation. The regulation of renewable energy in the law does not make this energy a priority directly. Indonesia's renewable energy potential is very large, starting from geothermal, wind, water, solar, bioenergy, and others. However, this legal standing does not automatically become a basis for exploring renewable energy sources.

One of the factors affecting the smoothness of state policy is legal factors which are made with aspirational, proactive, and credible principles (Romli, 2001). Especially for the use of renewable energy, all lines of legal regulations are needed to be able to succeed in this program offers. That currently it must be admitted that the Energy Law has not been able to become a legal umbrella for the use of renewable energy as a priority. So more specific rules are needed to be able to regulate the exploration of renewable energy as an alternative source of energy security while remaining in synergy with the environment. So that from these problems 2 (two) problem formulations are taken (1) What is the potential for new and renewable energy in Indonesia as an alternative source of environmentally friendly national Energy Security? (2) How is the right legal support to succeed in optimizing new and renewable energy that is environmentally friendly in Indonesia?

The purpose of this paper is to solve all the problems that are the object of the study. First, to find out, understand and analyze all potential renewable energy content in Indonesia as an alternative source of national energy security. Second, to find out, understand, and analyze appropriate legal support to succeed in optimizing environmentally friendly renewable energy in Indonesia.

MATERIALS AND METHODS

This type of research in writing uses normative legal research methods. This research is focused on studying the application of the rules or norms in positive law. The research approach of this paper uses a statutory approach that is related to energy. Then this writing also uses a conceptual research approach that has been selected and becomes a reference for discussion.

Sources of research data using primary and secondary data. Primary data consists of laws and regulations. Then the secondary data consists of legal papers (books, journals, articles, etc.). The data collection technique used in this paper is a literature study. A literature study is carried out by reading, studying, taking notes, making reviews of library materials that are related to the rules and concepts of new and renewable energy.

In normative legal research, data processing is carried out by systematically applying written legal materials. Systematic means making a classification of these legal materials to facilitate analysis and construction work. Especially the analysis provides the construction of a proposed regulation that can act as a legal basis for optimizing the use of new and renewable energy which is environmentally friendly in Indonesia.

RESULTS AND DISCUSSION

The Potential of New and Renewable Energy

Energy is a strategic commodity that affects the sustainability of development, which in its management requires care and wisdom. If the energy supply decreases, it will cause an increase in energy prices which will result in a decrease in energy purchasing power. This will have an impact on the collapse of economic activities and are destructive to production and consumption activities. Thus the supply of energy plays a very important role because the demand for energy as a primary commodity tends to always increase.

Meanwhile, the use of energy itself in Indonesia is still dominated by the use of non-renewable energy derived from fossils, particularly oil and coal (Azhar et al., 2018). However, over time, the availability of fossil energy is decreasing, and to anticipate this new renewable energy (EBT) is the best alternative (Komunikasi, 2016). The use of new and renewable energy must be the main concern of the Indonesian government not only as an effort to reduce the use of fossil energy but also to realize clean or environmentally friendly energy (Jaelani et al., 2017).

For the increased energy needs to be met, while the fossil-based energy reserves will certainly decrease, it is necessary to have a strategy of substitution to renewable energy sources with enormous potential in Indonesia. The ideal condition that should be fulfilled is when the use of fossil energy occurs, it can be replaced by the discovery of new fossil energy reserves or replaced by oil from alternative energy sources. So that Indonesia will have energy independence in the future with stable economic growth and development without dependence on non-renewable fossil energy.

In Indonesia, nature has provided an abundant and free source of energy to be utilized by all living things, especially for the Indonesian people themselves. However, to support the activities of human life on earth, humans also need to manage and develop the energies that are already available in nature to meet their daily needs.

According to Law Number 30 of 2007 concerning Energy, the meaning of New Energy is contained in article 1 paragraph (5), namely energy originating from new energy sources. Meanwhile, new energy sources are energy sources that can be produced by new technology, both from renewable energy sources and non-renewable energy sources, including nuclear, hydrogen, coal bed methane, and liquified coal, and gasified coal.

New energy is energy developed from the results of research and technology and technology development that cannot be included in the fossil energy or renewable energy group, for example, nuclear energy, plasma energy (magneto-hydrodynamics), or fuel cell energy (Ariono Abdulkadir, 2011). New energy is a type of energy whose development is driven by technological interventions. Meanwhile, the definition of renewable energy is energy that comes from renewable energy sources. Renewable energy sources are energy sources that can be used indefinitely and will never run out because they can be recovered in a relatively short time (Daryanto, 2007).

Renewable energy sources are energy sources that are very environmentally friendly because they do not produce environmental pollution and are not one of the causes of climate change and global warming because the energy produced comes from sustainable natural processes such as wind, water, sunlight, geothermal, and biofuels (ESDM, 2018). This is also contained in Law Number 30 of the Year concerning Energy, the definition of renewable energy is stated in Article 1 paragraph (6), namely, energy sources produced from sustainable energy resources if managed properly, including geothermal, wind, bioenergy, sunlight, water flow, and waterfall, as well as the movement and temperature differences of the ocean layers.

Indonesia is one of the countries that has a very large number of potential sources of renewable energy due to the astronomical and geographic influence of the Indonesian state. Potential renewable energy sources contained in Indonesia such as geothermal energy, solar, water, sea/ocean, bioenergy. The following is an explanation along with data related to the potential for renewable energy sources that the authors have successfully compiled:

1. Geothermal Energy

Indonesia is a country that is also rich in geothermal potential because it is included in volcanic areas. This is due to the geographical conditions of Indonesia which are passed by the Ring of Fire, which is a volcanic route that stretches across Indonesia from the tip of Sumatra Island along with the islands of Java, Bali, NTT, NTB to the Banda Islands, Halmahera and Sulawesi Island. The survey shows that there are 70 geothermal locations with high temperatures with a total capacity of 19,658 MW. Most of these locations have not been exploited intensively (Komunikasi, 2016). According to the latest records from the Geological Agency, the geothermal potential in Indonesia is 23.9 Giga Watt (GW) until December 2019. Based on data from the Geothermal Directorate, this potential has only been exploited for 8.9% or 2,130.6 MW, much of which has yet to

be utilized. Regarding this, the Government is targeting an increase in geothermal utilization to 7,241.5 MW or 16.8% in 2025(ESDM, n.d.).

2. Solar energy

Indonesia is located on the equator which causes Indonesia to have a tropical climate, the majority of areas in Indonesia are always exposed to the hot sun. Based on solar radiation data collected from 18 locations in Indonesia, it shows that solar radiation in Indonesia can be classified as follows: for the western and eastern regions of Indonesia with the distribution of radiation in the Western Region of Indonesia around 4.5 kWh/m^2.day with a monthly variation of around 10% and Eastern Indonesia around 5.1 kWh/m^2.day with a monthly variation of around 9%, thus the potential for solar radiation in Indonesia averages around 4.8 kWh/m^2.day with a monthly variation of around 9%. But, the latest updated data Indonesia has the potential for solar radiation of 207.8 GWp, which is only realized by PLTS of 0.15 GWp (0.07%) of the total solar potential in Indonesia (Lubis, 2007).

3. Water

Indonesia has great potential for the development of hydropower plants because there are abundant hydropower sources in Indonesia. This potential is due to Indonesia's mountainous and hilly topography and is fed by many rivers and certain areas have lakes/reservoirs that are quite potential as a source of water energy(ESDM, 2018). And also based on the potential data for PLTA and also PLTMH of 75 GW and 19.3 GW, but what can only be realized for PLTA is only 5.18 GW (6.75%) and for PLTMH only 0.24 GW (1.23%) this is very unfortunate because it should be able to benefit as well as possible (ESDM, 2018).

4. Ocean/Ocean currents

Based on the data, the potential for PLTAL is 17.9 GW but with this huge potential, the realization is still not there because the utilization of ocean/ocean currents is still in the research stage and cannot be used(Hendri Firman Windarto, 2020). The potential is huge for ocean/ocean currents because basically, Indonesia itself is an archipelago that has more water than land. The area of the Indonesian sea is 65% of the total area of Indonesia, namely 3,544,743.9 km², with a coastline that stretches along 81,000 km, consisting of deep seas and shallow seas. By looking at the vast area of the seas and oceans of the state of Indonesia, it can be estimated that Indonesia has abundant marine/ oceanic energy sources.

5. Wind

In general, Indonesia is categorized as a windless country, given that the minimum average wind speed that can be economically developed as an energy service provider is 4m/s (Lubis, 2007). But, several regions in Indonesia have the potential for wind energy sources. These areas are located, among others, in eastern Indonesia such as East Nusa Tenggara (NTT), West Nusa Tenggara (NTB), South Sulawesi and Southeast. This is supported by the data obtained regarding the potential of PLTB to use the wind of 60.6 GW and only 0.076 GW (0.13%) (Hendri Firman Windarto, 2020).

6. Bioenergy

Indonesia as an agricultural country has a relatively large potential for biomass from agricultural, plantation, forestry, livestock waste, and municipal waste (garbage) (Daryanto, 2007). Data from PLT Bio Potential in Indonesia is 32.6 GW and only 1.859 GW (0.42%) can be realized (Hendri Firman Windarto, 2020).

The six of New and Renewable Energy (EBT), according to the author, can maximize its use and is classified as clean and low-carbon energy, besides that EBT also has other impacts besides being environmentally friendly, it can also: (1) Reducing the cost of the National Electricity Production (BPP), the allocation of which can be used for more important sectors; (2) Lowering electricity tariffs at affordable prices, this will automatically happen because the National Electricity Production Cost of the Nation is Decreased; (3) Increase Installed Capacity and GDP per capita; (4) Supporting the revival of the manufacturing industry and the electrification ratio; (5) Supporting the Energy Sector Commitment to the Paris Agreement; (6) And the last one is to keep the Republic of Indonesia as an archipelagic country because it suppresses global warming which causes sea levels to rise.

Legal Support for the Success of Optimizing Environmentally Friendly New and Renewable Energy in Indonesia

1. The Urgency of the Law as the basis for the policy to optimize the Use of Renewable Energy in Indonesia

The function of law in this modern era does not only regulate human behavior but also enter the

realm of public policy. This is in line with the opinion of Satjipto Rahardjo who explains the dynamic position of law. That the law is not just re-recording patterns of human behavior in society. Instead, the law is attempted to be a means of channeling policies to be able to create new conditions or change something that already exists (Satjipto Rahardjo, 1979).

To optimize the use of new and renewable energy in Indonesia, legal factors are one that can have an effect. This cannot be separated from Indonesia's position as a constitutional state as regulated in Article 1 paragraph (3) of the 1945 Constitution. So as a rule of law, if you want to use renewable energy, you must have a legal basis. The legal basis will be a form of certainty in maintaining the country's political will commitment to be able to carry out the mandate of the regulation, in this case, the proposal is to optimize new and renewable energy.

The urgency of new and renewable energy in the constitution also plays an important role in the management of natural resources. explicitly explained in Article 33 paragraph (3) of the 1945 Constitution contains 3 (three) important elements, namely: (1) Substance (natural resources); (2) Status (controlled by the state); (3) Aim (for the greatest prosperity of the people) (Purba, 2006). Based on the constitution, the existence of control and exploitation of natural resources which are fundamental to the life of the nation and state is carried out by the state (Redi, 2014).

Based on the constitution, that the use of renewable energy is carried out to meet the needs of natural resources for the life of the nation and state. When viewed from the perspective of Article 33 paragraph (3) of the 1945 Constitution, the use of renewable energy has concrete objectives for the wider community. First the substance, that renewable energy is part of natural resources. So it needs to be regulated as part of natural resources that can be utilized. The second status is that renewable energy in Indonesia is automatically controlled by the Government. So the government must be able to manage these resources so that they are not misused. The third objective is that renewable energy is part of natural resources and controlled by the state, so its management objective is for the greatest welfare of the people.

2. New and Renewable Energy in Indonesia's Positive Law

One of Indonesia's commitments to optimize the use of new and renewable energy is to ratify the Agreement To The United Nations Framework Convention on Climate Change in Act No. 16, 2016. The Countries that have ratified the Paris Agreement are none other than participating in limiting global temperature increases below 2 degrees C from the pre-industrial level and making efforts to limit them to below 1.5 degrees C (Article 2).

To maintain global temperature stability, one of the efforts made is to reduce the increase in carbon emission gases. To achieve this goal, the member countries will make efforts to reduce greenhouse gas emissions as soon as possible through mitigation actions (Article 4). This means that the state should make policies to prevent an increase in carbon emission gases which can affect environmental stability. So from that commitment, it is the space for Indonesia to immediately be able to take advantage of new and renewable energy. In general, energy optimization is the main option considering that energy is very environmentally friendly. The impact is that it will be able to immediately suppress the increase in gas emissions, which at that time emerged from industrialization activities based on non-renewable energy. The ratification of the Paris Agreement is one of Indonesia's ammunition in pursuing the target of utilizing new and renewable energy. Currently, the use of renewable energy is still very minimal, which is only 8 (eight)%. Meanwhile, based on PP. 79 of 2014 concerning the National Energy Policy that the target in 2025 is 23%. This accelerated transition requires all components to work together to realize the plan. Especially in the PP then in 2050, Indonesia's target in utilizing renewable energy is 31%. This target will shift the position of renewable energy, which until now has become the main energy source. If it is not accompanied by action, the target will only be wishful thinking.

Before the ratification of the Paris Agreement, renewable energy was regulated in advance in Act No. 30 of 2007 concerning Energy. In that Act, new energy sources are energy sources that can be produced by new technology, both from renewable energy sources and non-renewable energy sources

(Article 1 point 4), including nuclear, hydrogen, methane gas, coal, coal. liquefied and grazed coal.

Article 1 point 5 states that new energy is energy that comes from new energy sources. Then in article 1 point 6 explains that renewable energy sources are energy sources that are produced from renewable and sustainable energy sources. And in article 1 number 7 is strictly regulated regarding the position of new and renewable energy contained in the Energy Act.

Renewable energy is further regulated in the Regulation of the Minister of Energy and Mineral Resources No. 4 of 2020 on the amendment of Regulation of the Minister of Energy and Mineral Resources No. 50 of 2017 on the Utilization of New and Renewable Energy. There are several important points in the rules regarding the regulation of renewable energy. That the Ministerial Regulation has regulated a scheme for utilizing renewable energy as additional energy, such as additional electricity generation by the State Electricity Company (PLN).

3. Need an Independent Regulation Specifically Regulating the Use of New and Renewable Energy as the Main Source of Energy Security

The legal issue regarding new and renewable energy lies in the problem that there are no independent legal rules that specifically regulate this energy. Whereas in the existing regulations, the position of renewable energy is only regulated in a more general manner. Renewable energy regulations are specifically regulated only in a Ministerial Regulation. However, the regulation also only regulates the technical use of renewable energy as additional energy.

For a policy to use renewable energy as a priority strategic policy, there needs to be support for legal certainty. Due to the absence of provisions on the use of renewable energy as a priority policy, the legal basis for the use of renewable energy is still unclear. This means that there is still a gap for the Government not to use this energy as a source of energy security.

The Indonesian House Of Representative (DPR RI) is currently in the process of drafting a Bill on New and Renewable Energy. The bill is hope for realizing a form of legal certainty to optimize the use of renewable energy as the main source of National Energy Security. The bill regulates the plan for gradual energy transformation to become renewable energy as the main energy source (Article 3). Besides, the scope of the bill regulates control, new and renewable energy sources, permits for the use of renewable energy, environmental management, research and development, and others.

The problem in the Renewable Energy Bill does not regulate the portion of the utilization of all lines of renewable energy sources. This becomes a problem as if the direction of this bill only regulates the use of renewable energy based on the available options. Even though the potential for renewable energy sources in Indonesia is very varied. Starting from nuclear, solar, water, wind, hydrogen, methane gas, coal, liquefied coal, and coal. The bill of regulating should accommodate all renewable energy sources to become the main source that can be utilized. Because if there is no provision regarding the portion of energy use, then optimizing energy use can focus on one energy source. As a result, the potential for other renewable energy sources is not used optimally. This can be futile because other potential energy sources are not utilized optimally. Every potential source of new and renewable energy has extraordinary energy reserves. If used optimally, it can become a unit to form a strong renewable energy source to meet the needs of national energy security.

The Bill on New and Renewable Energy must be able to regulate all existing new energy sources. The goal is that the basis for energy utilization is not driven by just one energy. The independent rules that regulate renewable energy will become concrete guidelines for state policies in the realm of energy security. This regulatory position will become the legal basis for the exploration of new and renewable energy. If there is legal support that regulates the use of renewable energy in a priority manner, then the legal basis is certain to be able to transform sources of energy security.

4. Optimizing the Use of Environmentally Friendly Renewable Energy Based on Indonesia's Positive Law

One of the parameters of the idea of optimizing the use of new and renewable energy which is environmentally friendly in Indonesia is Act No. 32 of 2009 concerning Management and Protection of the Environment. Although basically, renewable energy is environmentally friendly, it is

mandatory to have a legal direction to direct environmental law policies. The goal is that all environmental protection principles contained in the regulation can still be implemented.

When using the parameters of the Law on Environmental Management and Protection, the implementation of this energy policy must be based on the principles contained in the law. The principles of the Law on Environmental Management and Protection which will be the parameters for the new and renewable energy policy that are environmentally friendly will be explained below:

a. Principle of Sustainability

This principle has a mandate about everything, both the government and society are obliged to protect the environment for the fate of future generations. This responsibility is to continue to manage a good environment so that it remains sustainable and sustainable so that it remains feasible for the future.

In realizing these goals, the options for optimizing new and renewable energy are the main options that can be applied. Environmentally-friendly renewable energy will not be a threat to the environment. Environmentally friendly energy management will keep the environment sustainable. Then the nature of renewable energy, which can be renewed, will become an infinite energy base in the future.

b. Principle of Biodiversity

This principle has a mandate that environmental management must continue to provide synergy to the surrounding ecosystem. Environmental management must be carried out in an integrated manner to maintain existence, diversity, and sustainability. Living natural resources consisting of natural-vegetable resources and animal resources that live around the need to be protected.

The use of renewable energy supports the implementation of this principle. Renewable energy is an alternative policy that is environmentally friendly. There will be no exploitation of the environment on a large scale. So that it will not threaten all ecosystems that will maintain their existence.

c. Principle of Ecorogion

This principle means that environmental management must maintain the characteristics of natural resources, ecosystems, geographical conditions, local culture, and existing local wisdom. Environmentally friendly and renewable characteristics in the study of renewable energy will be components that still pay attention to all existing ecosystems. So that the circulation of life in the components of the ecosystem synergizes well.

d. Principle of Usefulness

This principle means that environmental management in development is carried out based on the potential of natural resources and the environment. The goal is that the potential is used as an improvement in community welfare in harmony with the environment. Renewable energy management will use natural potentials that remain in synergy so that the benefits of these potentials natural resources are utilized in the community.

e. Principle of Justice

This principle is a fundamental principle of law that cannot be separated from environmental management. This means that environmental management must be proportional to every citizen, both across regions, across generations, and genders. Utilization of the great potential of renewable energy will create a component of energy sources that will strengthen national energy security for the Indonesian people.

CONCLUSION

Renewable energy sources are energy sources that are very environmentally friendly, while the energy produced comes from sustainable natural processes such as wind, water, sunlight, geothermal, and biofuels. This is also contained in Law Number 30 of the Year concerning Energy, the definition of renewable energy is stated in Article 1 paragraph (6), namely, energy sources produced from sustainable energy resources if managed properly, including geothermal, wind, bioenergy, sunlight, water flow, and waterfall, as well as the movement and temperature differences of the ocean layers. If this renewable energy is implemented in Indonesia, it is very possible. This is because Indonesia is located on the equator, and makes this country has supporting factors such as wind, geothermal (geothermal), sunlight, and water.

Legal support in the context of optimizing the use of environmentally friendly renewable energy is one of the factors that can make this energy transformation bid plan successful. That the

ratification of the Paris Agreement by Indonesia is one of the commitments to reduce carbon emission gases. One of the efforts made could be through the optimization of environmentally friendly renewable energy which will avoid excessive carbon gas production. However, Indonesia needs to formulate special rules that regulate renewable energy independently. The goal is to form a clear legal basis as a commitment to shift renewable energy into the main source of national energy security. For the optimization of renewable energy to continue to ensure environmental stability, this policy needs to be accompanied by the basic parameters in Law no. 32 of 2009 concerning Management and Protection of the Environment. The principles are the principles of sustainability and sustainability, Biodiversity, Ecoregion, Benefit, and Justice.

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