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Research Article

Indonesia And Germany Bilateral Cooperation Towards Renewable Energy Transition Through Clean, Affordable and Secure Energy (Case)

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Abstract

The Russian-Ukraine conflict has caused a threat to energy security that encourages the Indone- sian government in pursuing transition toward renewable energy. To actualize this transition to- wards renewable energy, Indonesia invites external actors to collaborate, such as Germany through Clean, Affordable, and Secure Energy (CASE) programme. This article aims to inform and raise awareness towards Indonesian government efforts in tackling energy security threats through bilateral cooperation with Germany through the CASE programme. This research fo- cuses on how CASE programme assists Indonesia in objectifying transition towards renewable energy and its attempt to overcome various challenges of energy transition, such as low invest- ment rate towards renewable energy and ineffective budget allocation based on the concept of energy security. This article uses a descriptive-qualitative research design. The analysis showed that Indonesia-Germany bilateral cooperation through CASE programme has helped Indonesia to maximize renewable energy potential through research assistance, public participation en- couragement, discussions between stakeholders, and assistance in technical matters. This article concludes that CASE programme has actually offered resolutions towards Indonesia's problems in renewable energy transition, such as: encouraging the ratification of the Presidential Decree of NRE to enhance investment in renewable energy sector and providing research assistance in the development of renewable energy technology. However, the Indonesian government's de- layed response towards the Presidential Decree of NRE is a challenge to CASE Programme im- plementation in Indonesia.

Keywords: *CASE Programme; Indonesia; Germany; Indonesia-Germany Cooperation; Renewable Energy Transition*

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INTRODUCTION

The urgency of renewable energy has always been the main topics in Indonesia. Since the 1970s, the dialogues regarding efforts to reduce dependence on the use of petroleum have begun to be implemented by Indonesia (Nugroho, 2019). The initial step of Indonesia for the efforts to reduce the use of petroleum was to establish *Badan Koordinasi Energi* (BAKOREN) in 1981 or what is now known as National Energy Council (Dewan Energi Nasional, 2016). The encouragement in implementing renewable energy resources was also done by external factors. Through the implementation of the 7th Sustainable Development Goals regarding affordable and clean energy in 2015 by the United Nations along with the period of Indonesia's leadership in G20 in 2022, the discourse on transitioning renewable energy resources has always been on top of the agenda to be achieved by Indonesia.

The urgency of the transition to new and renewable energy (NRE) is motivated by various factors, some of which are the harmful impacts caused by the use of non-renewable energy resources and the limited availability of various non-renewable energy resources. The utilization of non-renewable energy resources has affected various aspects of people's lives, including the economy and poverty reduction efforts, social development and sustainable development, as well as various problems with community livelihoods, access to clean water, agricultural productivity, health problems, populations, education and gender (Umar & Abubakar, 2014). In the environmental sector, the use of non-renewable energy has impacted to climate change, rising sea levels, which also affected the occurrence of various extreme weather conditions, environmental degradation and pollution (Umar & Abubakar, 2014). The usage of non-renewable energy resources and carbon emission gases also has implications for the decline in human well-being resulting in death and an impact on the decrease in the number of human resources and the country's economic growth (Asghar et al., 2019).

The urgency of the transition on the use of renewable energy has also increased by Indonesians and the global community due to the heated conflict by Russia and Ukraine in 2022. Conflict between Russia and Ukraine has led to the emergence of various global problems. Apart from humanitarian crises and food insecurity, energy security problems also occurred along with Russia's role as the second largest oil supplier in the world. As a result of the conflict involving petroleum supplier country, the world crude oil price has increased to almost US$115 per barrel since Russia invaded Ukraine. This price is also the highest price ever set for crude oil since September 2014 (Margenta & Yusgiantoro, 2022).

According to energy analysts and financial institutions, such as Barclays and Rystad Energy, the conflict between Russia and Ukraine has caused the biggest shock to energy supply and the worst case scenario could lead to an increase in oil prices that can reach US$200 per barrel (Benton et al., 2022). Based on the report released by the International Energy Agency (IEA), since last September 2021, amid the dependence of the United Kingdom and the European Union on natural gas supplies from Russia, there have been restrictions on the supply of Russian natural gas to the EU market. The reduction in supply of natural gas from Russia to the European market has decreased by 25% in the fourth quarter of 2021 and further decreased to 37% in February 2022. Meanwhile, countries in Southeast Asia that are trying to achieve the renewable energy target of 23% by 2025 are experiencing obstacles due to the rising mineral prices which take an important role as a component of renewable energy technology, particularly nickel and palladium by 60% (Huda, 2022). The increase in prices for nickel and palladium minerals was followed by the imposition of economic sanctions by the westerns such as the United Kingdom, the United States, and the European Union against Russia as the world's largest nickel and palladium exporter (Viscor, 2022). This has caused several regions in the world, such as Southeast Asia and Europe, which are dependent on energy supplies originating from Russia, to experience a slump in the supply of energy resources.

The threat to Indonesia’s energy security in the midst of global dynamics is an impetus for Indonesia to achieve a faster transition to renewable energy resources. This can be seen in the stipulation of commitment by the government of Indonesia, particularly during the Jokowi leadership era, to accelerate the transition from energy use to new and renewable energy (NRE) by 23% to be achieved by 2025 and a commitment to achieve Zero Net Emission by 2060 or earlier (Pribadi, 2022). To achieve this goal, Indonesia also establishes collaboration with external actors, both state and non-state, through various international forums, foreign policies, as well as establishing diplomatic relations with other countries.

One of the Indonesian government's efforts to achieve Net Zero Emission by 2060 is to collaborate with the German government in maximizing the implementation of the renewable energy transition through the Clean, Affordable, Secure Energy (CASE) program. How the CASE programme can assist the government of Indonesia in making the transition to the use of EBT is the problem that will be discussed in this article. The purpose of this article is to provide information and increase the reader's anticipation of the government's efforts to tackle energy security threats in the midst of global dynamics through bilateral cooperation with Germany through the CASE programme.

The shortage of non-renewable energy resources have been the background for the emergence of energy security discourse. The understanding of the concept of energy security itself is divided into two different periods, the classical and contemporary energy security concepts. The classical understanding of energy security in the 1970s and 1980s was still limited to efforts to provide a stable supply of petroleum energy resources as an effort to avoid embargoes and manipulation of oil prices by exporters. On the other hand, in the contemporary period, the understanding of the concept of energy security has greatly expanded its meaning. The concept of energy security is not only limited to discussing the availability of petroleum energy resources at affordable prices, but also ensuring the availability and price stability of other energy resources, such as natural gas, coal, and so on. In addition, the issues discussed are not only limited to energy supply, but also include various issues such as energy policy, access to modern energy supply, and environmental resilience as a consequence of excessive energy use. Furthermore, the issues discussed are not only limited to energy supply, but also include various issues such as energy policy, access to modern energy supply, and environmental resilience as a consequence of excessive energy use (Wang and Zhou, 2017).

Energy security is defined by the International Energy Agency (IEA) as the absence of obstacles to efforts in providing affordable energy resources (Chung et al., 2017). In addition, energy security is a concept aimed for the fulfillment of basic human needs, such as the need for energy, so that individuals and countries can achieve freedom of choice according to the concept of Maslow's hierarchy of needs (Azzuni & Breyer, 2017). In the perspective of developing countries, energy security is known as the ability of developing countries to access stable modern energy services and the convergence of demand and supply for energy in the country's economy (Kanchana and Unesaki, 2015).

In analyzing the level of energy security in a country, Elkind explained that there are at least four indicators that can be used to measure energy security, which are *availability*, the country's independent ability to fulfill energy resources so as to minimize efforts to import energy resources; *reliability*, the maintenance of available energy resources from supply disruptions through diversification of energy resources and technology and diversification of energy supply chains; *affordability*, including the ability of the state to provide low prices for energy supply so that it can be accessed by a wider audience as well as the ability to stabilize prices and equitable distribution of available energy access; as well as being able to support *sustainability* through the capability to have a minimal impact on environmental pollution (Sovacool, 2011). In addition to the energy security indicators presented by Elkind, there is an indicator that is specially prepared

to measure energy security in developing countries, which is sustainable energy security (SES) described by Narula and Reddy that divides the structure of the energy system into several sub-systems which then each sub-system will be evaluated according to four components, which are availability, affordability, efficiency and acceptability based on quantitative metrics. The purpose of the preparation of the SES is to assess the energy security of a country in order to evaluate the energy policy set by the country (Narula and Reddy, 2015). Based on those indicators, the Russian-Ukrainian conflict has caused two of the four energy security indicators in Indonesia, namely availability and affordability, to not be met properly, indicating that Indonesia is facing a threat to energy security. This statement is supported by the IEA's explanation that the conflict between Russia and Ukraine has had a major impact on international energy security threats (IEA, 2022). One concrete example of impact of the Russian-Ukrainian conflict on the limited and inaccessible energy resources in Indonesia is the availability of crude oil as a source of transportation fuel in Indonesia. The need for crude oil consumption in Indonesia is deemed very high, reaching 1.4 to 1.5 million barrels per day. However, the production capacity of crude oil in Indonesia only reaches less than 700 thousand barrels per day. This causes Indonesia to import crude oil of 700 to 800 thousand barrels per day to fulfill the needs of crude oil consumption in the midst of soaring world crude oil prices and result in an increase in the subsidy budget of Rp2.65 trillion per US$1 increase in world oil prices (Permana, 2022). This resulted in the escalation of Indonesia's 2022 State Budget along with the potential for domestic inflation of 0.7% (Wicaksana, Ramadhan, Sujaka, & Salahudin, 2022).

The results of previous studies explained that Indonesia is one of the countries with the highest level of energy demand in the Southeast Asia region with total consumption exceeding 100,001 kilo tons of petroleum per year. In addition, Indonesia is also ranked first as a country with the highest level of coal and natural gas consumption in the Southeast Asia region (Kanchana and Unesaki, 2015). In addition to the high level of energy consumption, Indonesia is also a country with a very high potential for renewable energy resources as it has the highest geothermal potential in the world (Nugroho, 2019). Despite its great potential, there are several challenges in implement- ing efforts to renewable energy resources, such as the need for community participation in these efforts. Based on the energy citizenship theory and the choice awareness theory, the transition to renewable energy resources is not only a problem that is limited to the energy sector, but will also have an impact on the structure of society. The term energy citizenship refers to the involve- ment of individuals in the transition to the use of NRE as a consequence of community empowerment and action efforts. Choice awareness theory is a

theory that describes the collective per- ception of the actual choices that are implemented when a technological change is categorized as quite radical, such as the energy transition to NRE (Cantarero, 2020). There is a need for invest- ment in industrial technology accompanied by policy formulations related to investment alloca- tion in order to encourage the transition process to the use of NRE (Hidayatno et al., 2018). In addition to the many factors that need to be considered in the process of implementing the energy transition to renewable energy resources, Indonesia has successfully attracted international atten- tion in the implementation process. This is because Indonesia in two years, which is a fairly short period of time, has succeeded in increasing its solar energy capacity from 9 megawatts (MW) to more than 240 MW (Kennedy, 2018).

Based on the availability of literature review at the time this article was written, there are no articles that specifically discuss the procurement of Indonesia-Germany cooperation through the CASE programme in encouraging the government's efforts in realizing the transition to the use of renewable energy other than news sources and articles released officially by the Institute for Essential Services Reform (IESR), Director General of New Energy, and *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ)'s official websites. Therefore, novelty of this article is written as a form of discussing benefits, objectives, processes, and efforts of the Indonesian government that have been successfully realized in an effort to realize the energy transition through the establishment of bilateral relations between Indonesia and Germany in the Clean, Affordable, Secure Energy (CASE) programme which took place in the period from 2020 to 2024 and to come. The sources of research described in this article are purely based on official statements from stakeholders in Indonesia-Germany bilateral cooperation in the transition of renewable energy through the CASE programme.

RESEARCH METHOD

The method used in this article is a case study based on qualitative research methods. Qualitative research is based on the researcher's interpretation of an event to help understand the reality. Based on qualitative research methods, the results of the research are described by the author descriptively. The data needed in the process of the writing of this journal comes from other relevant articles, news, and official statements released by the government of Indonesia and Germany through official websites and obtained from online-based sources. Through the data that has been obtained, the authors selected and reduced the data to be then interpreted through a descriptive elaboration which was written into the information contained in this article.

RESULTS AND DISCUSSION

New Renewable Energy (NRE) Transition through the CASE programme

The Clean, Affordable, and Secure Energy (CASE) programme is a program initiated by the government of Germany on February 2, 2021, in its effort to establish collaborations between Germany and the Southeast Asian region, including Indonesia, in promoting the transition to renewable energy sources. This program is motivated by the potential of renewable energy resources which is very large in the Southeast Asian region. However, until now Southeast Asia is still very dependent on the use of coal-fired energy resources up to 40% and still has a very high potential for developing coal-fired energy resources in the future. Therefore, the German government through the CASE programme seeks to maximize the use of NRE to achieve sustainable living and to realize the Paris Agreement by targeting the four largest countries, both in terms of GDP and population in Southeast Asia, such as Indonesia, the Philippines, Thailand, and Vietnam, in making a more significant impact in the Southeast Asia region (CASE for Southeast Asia, 2020). The CASE programme series consists of five main components: (1) Research on NRE sources; (2) Mapping of activity transparency and stakeholder involvement; (3) dialogue and action implementations involving stakeholders in the effort to transition to the use of NRE; (4) providing technical assistance to increase the capacity of the stakeholders involved; and (5) continuing discussions regarding the use of sustainable energy sources in the public sphere (GIZ, 2020).

The Indonesian and German governments have signed a cooperation agreement on February 2, 2021 through the Ministry of National Development Planning or Bappenas and the German Federal Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety in an effort to encourage the transition to the use of renewable energy for Indonesia. The cooperation between the two countries also established the involvement of international organizations, which are IESR (Indonesia) and *The Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ, Germany). IESR explained that Indonesia's strategic position as the holder of the G20 presidency in 2022 and Indonesia's economic potential as one of the largest GDP-earning countries in the Southeast Asia region were factors that encouraged Germany to agree on the CASE programme cooperation (Saputra and Simanjuntak, 2021).

For Indonesia, the implementation of the CASE program has the potential to maximize the utilization of NRE resources in Indonesia, which has quite a large potential. Through bilateral cooperation with Germany through the CASE programme, there is a greater opportunity for In-

donesia to provide environmentally friendly energy resources at relatively lower costs by 2030 (Kementrian PPN, 2021). Indonesia's national target in implementing the energy transition to renewable energy is to reach 23% by 2025 with an annual target of effective utilization of NRE resources of 1,500 MW or 4% per year (EBTKE, 2021).

Germany is one of the countries with a very high utilization rate of NRE resources, which is more than 50%, making Germany one of the leading practitioners in the utilization of NRE resources. This makes the CASE programme an opportunity for Indonesia to obtain direct assistance from countries with the largest NRE utilization rates in the world in achieving the Net Zero Emission target by 2060. IESR explained that through the CASE bilateral cooperation programme, Indonesia also aims to stop the construction of new coal power plant after 2025. The target set by the Indonesian government can be considered to be quite ambitious judging from the utilization of NRE resources in Indonesia that is still quite low, which is at 11.5% in 2020 according to data uploaded by the Ministry of Energy and Mineral Resources or half of the total targets to be achieved by Indonesia. As an effort to achieve the transition target to NRE, Indonesia-Germany bilateral cooperation in the field of energy transition through the CASE programme is carried out inclusively by involving a number of stakeholders with different backgrounds to ensure the flawless realization of the CASE programme.

The Role of Stakeholders

In an effort to transition to NRE, it is necessary to have active involvement from stakeholders through their respective roles so that the transition process can run optimally. One of the most important keys in the development of the technology industry in Indonesia, including the transition process to NRE through the CASE programme, is collaboration between stakeholders (Hidayatno et al., 2018). The several actors involved in the transition to NRE are the President of the Republic of Indonesia and various government agencies as decision makers, investors and financial institutions as sources of financing, academics in assisting the research process as part of the CASE programme series, as well as community organizations to increase the inclusiveness of efforts to realize transition to NRE (Saputra and Jati, 2021).

It is important to highlight that stakeholders in the transition to NRE through the CASE programme are not only held by the Indonesian government, the German government, and investors, but the community also plays a significant role in it. It is necessary for the community to work hand in hand to get to know, study the implementation of the use of NRE, and gain awareness for the environment by involving religious leaders and law enforcement to encourage the

implementation of NRE technology in the future (Wardhana and Marifatullah, 2020). The important role of stakeholders is needed in the transition process to NRE because the process requires innovation in three aspects, such as financial, technical, and social at the same time. The transition process to NRE is not only limited to infrastructure development, but also requires flexibility and motivation from the community to switch to consuming NRE resources, so that the supply of NRE that will be built and is currently being built can reach its market demand (Lowitzsch, 2019).

The collaboration between stakeholders has been pursued by Indonesia through IESR which has openly encouraged collaboration and involvement between stakeholders, especially for academics in order to realize the development of pilot projects as well as conducting studies on activities in the CASE programme. Meanwhile, Germany as Indonesia's main partner in the CASE programme plays a role in facilitating the procurement of webinars which aim to increase stakeholder awareness of impacts, adopt financial instruments, and conduct discussions on the formulations of research synthesis regarding the determination of co-firing[1] and De-Risking Renewable Investment (DREI)[2] in the NRE transition for Indonesia.

The Government's Concrete Steps in Realizing the Energy Transition

For two years after the implementation of the Indonesia-Germany cooperation through the CASE programme through the progress report published by IESR in 2022, the realization of Indonesia's energy transition in the field is still very low. This is shown by data on the utilization of coal-based energy plants which still tend to dominate in Indonesia, which is as much as 66% compared to the use of renewable energy sources which only reach 13% of the total types of power plants (IESR, 2021). This makes Indonesia only able to increase the use of NRE resources by 1.5% for two years from 2020. In addition, the delay in the issuance of the Presidential Decree on New Renewable Energy has caused investors to be more interested in investing in energy sources that are more mainly used by the public, such as coal and fossil power plants, causing a low level of investment in the NRE sector.

[1] Co-firing is a short-term and low-cost option to convert biomass into a clean and efficient source of electricity. The co-firing process is carried out by adding biomass as a partial replacement fuel from a high-efficiency coal boiler (The U.S. Department of Energy (DOE), 2000).

[2] De-risking Renewable Energy Investment (DREI) is a quantitative and innovative framework designed to provide assistance to policy makers in developing countries to effectively promote and scale up private investment in renewable energy. (UNDP, 2020).

Compared to the investment in fossil power plants which received an investment of US$2.5 billion, the total investment in renewable power plants was only US$1.1 billion in the third quarter of 2021 (IESR, 2021). Based on the results of previous studies, although Indonesia has a fairly high potential source of NRE, the amount of investment in the renewable energy sector in Indonesia is still quite lagging behind other countries in the Southeast Asian region (Kennedy, 2018). This is very unfortunate because investment is one aspect that plays an important role in the process of transitioning energy to NRE resources. In addition to collaborating with Germany through the CASE programme, the Indonesian government also carried out other cooperation, both domestically and internationally, through cooperation with state-owned enterprises in energy, as well as with the private sector in Indonesia and the international sector through the Asian Development Bank (ADB) in formulating energy transition mechanism for the implementation of energy transition from coal to NRE (Setkab, 2022).

In the field of technology, the use of clean energy technology in Indonesia tends to be highly dependent on other countries. This creates vulnerability for Indonesia to be targeted as a target market for other countries for technology in the NRE sector and has the potential to cause cost overruns in terms of utilizing NRE technology. This makes independent access to technology and NRE infrastructure development one of the agenda to be executed by the government (Jati, 2022). However, the agenda for the ownership of NRE technology is still only a one of the goals that has to be achieved as it is now hindered by financing problems.

In response to the low realization of the energy transition, the Indonesian government has set new, stronger commitments related to the energy transition and efforts to address climate change as stated in the Sustainable Development Goals number 13. The Indonesian government is preparing various policies that can support the energy transition in the next few years, such as the PTLU moratorium and the determination of carbon taxes and encouraging collaboration with non-governmental actors such as companies and individuals by raising public funds in realizing renewable energy and installing rooftop PV systems[3] (IESR, 2021).

The results of the discussion presented in this article conclude that the implementation of the energy transition to renewable energy resources in Indonesia is still low after two years of bilateral cooperation between Indonesia and Germany through the CASE programme. The main problem that hinder the effectiveness of the transition to NRE resources through the CASE prog-

[3] Rooftop PV System is a solar panel installation system that utilizes the top part of a building.

ramme is the delay in the issuance of the Presidential Decree on NRE by the government of Indonesia, resulting to the the level of investment in the NRE sector still very low.

The results of this study are supported by previous research. Daszkiewicz (2020) explained that the stipulation of policies in the energy sector is an effective action in encouraging the transition of energy to NRE in several countries; Zakeri, et al. (2022) described the same thing, where climate and energy policies have succeeded in increasing security in energy supply and energy transition to natural gas in Europe; Chen (2022) and Chen, et al. (2022) concluded that energy policy greatly influences the energy transition in the Asia Pacific region; and Huhta (2022) explained that energy policy can be a facilitator in the energy transition process and act as a driver that guides the direction of development in the energy transition process. In addition, a study conducted by Rum and Wiryawan (2019) adds that there is a need for cooperation between the government and other actors in supporting pro-renewable energy policies domestically in supporting the transition process to the use of NRE.

CONCLUSION

The CASE programme provides opportunities in maximizing the utilization of NRE resources in Indonesia through a series of programs in it, including: 1) research on NRE sources; (2) mapping of activity transparency and stakeholder involvement; (3) dialogue and action implementations involving stakeholders in the effort to transition to the use of NRE; (4) providing technical assistance to increase the capacity of the stakeholders involved; and (5) continuing discussions regarding the use of sustainable energy sources in the public sphere. If the implementation of the CASE series of programs can be fully supported by the government, it will be able to encourage inter-stakeholder participation in order to accelerate the transition process to the utilization of NRE resources.

However, the reality shows that the impact of the establishment of cooperation between Indonesia and Germany through the CASE programme for Indonesia is still not optimal enough because during the two years of the program, the increase in the NRE transition that occurred was still in a very limited amount, which only reached 11.5% in 2020 and increased to 13% in December 2021 according to the IESR report. The low investment in the NRE sector compared to investment in coal energy resources is one of the most important factors limiting the output of

the implementation of the transition to the use of NRE itself because the amount of financing that can be utilized is still quite limited.

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