Conference

ASEAN Energy Market Integration and Indonesia's Policy to Address Energy Poverty: Convergence or Divergence?

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Abstract. Access to modern energy among Association of Southeast Asian Nations (ASEAN) member countries has not been evenly distributed and some member countries are still in a status of energy poverty. Therefore, ASEAN has initiated the integration of energy markets. Indonesia is one of the ASEAN countries that still needs to overcome the problem of inequality in access to energy, especially in remote, isolated, underdeveloped, rural and border areas. ASEAN Energy Market Integration (AEMI) is based on the logic that integration of energy markets would allow national governments to address energy policy challenges more effectively and efficiently than they are able to do on their own; it therefore emphasizes interconnectivity through trade and energy investment. This study analyzed the linkage between the points of agreement in AEMI and the implementation of Indonesian policies in the context of harmonization of regulations, development of energy infrastructure, and subsidy policies. Using qualitative research methods, this study sought to rationalize whether the linkage between AEMI and Indonesian policies was convergent or divergent. This study concluded that there was a convergence between the AEMI agreement and the implementation of policies in Indonesia to address energy poverty.

Keywords: AEMI, energy poverty, Indonesia, policy, electrification, new and renewable energy

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1. Introduction

Energy is an essential aspect of human life. Limited or no access to modern energy can affect the quality of human life, both at the household level and at the larger community level. The quality of human life here is related to many aspects, such as health, education, economy, gender, and social development. Based on the 2018 *International Energy Agency* (IEA) data, about 11% of the global population, or about 840 million people in the world, still have limited access to modern energy (1). Nearly 97% of the world's population who do not have adequate access to electricity come from developing countries.

The IEA defines limited access to modern energy, particularly access to electricity and clean cooking facilities, as energy poverty. Reddy and Reddy (2004) in Navarro, Sambodo, and Todoc(2) define energy poverty as the absence of adequate options in accessing adequate, affordable, reliable, high-quality, safe, and environmentally friendly energy services to support economic growth and human development.

The energy poverty rate of ASEAN countries is higher than other countries in the region. More than a fifth (or around 130 million people) in the Southeast Asian region do not have adequate access to electricity. Nearly half (45%) of the population of Southeast Asia also still rely on the use of traditional biomass fuels for cooking (3). Some countries, such as Cambodia and Myanmar, tend to have slower electrification rates compared to other ASEAN countries, consecutively 72% and 42% in 2020 (4). Limited access to electricity is also found in rural areas in Laos, the Philippines, and Indonesia. Only four ASEAN countries have adequate electrification levels, with electricity availability in urban areas reach 100%, namely Singapore, Malaysia, Brunei Darussalam, and Vietnam (2).The IEA projects that around 63 million people in Southeast Asia will still have limited access to electricity by 2030 (5).Based on the condition of access to electricity in these Southeast Asian countries, policies to improve the electricity ratio in rural areas are important and challenging, both at the national and regional levels. This issue is even more challenging for archipelagic countries with large populations, such as the Philippines and Indonesia.

The problem of energy poverty is still a challenge in Indonesia. As a country that has 16,056 islands, (6)equitable distribution of electricity is a problem that is still being faced by the Government. The electrification ratio in Indonesia varies in each province. Some provinces have shown a ratio of above 90%, but provinces in eastern Indonesia such as Papua and East Nusa Tenggara are only around 61.4% and 59.8%, respectively (6).

Indonesia's national energy policy targets the achievement of a national electrification ratio of up to 99.7% by 2025 (1). Law No. 30 of 2007, Article 3 (f), which regulates energy explicitly also shows the Government's target to overcome inequality in energy access, especially in remote areas to realize people's welfare more evenly. This Government regulation is supported by a subsidy scheme and technical assistance to increase energy availability and access, as well as energy infrastructure development, especially in underdeveloped areas (7).

As a follow-up, for small islands that do not have access to electricity, the Government promotes a decentralized *off-grid* system through solar panel technology for housing. This is reinforced by the Presidential Regulation No. 47 of 2017 concerning

Table 1: Electric Power Consumption (kWh per capita)[8]

Country	2012	2013	2014	2015
Brunei Darussalam	9240.7	9873.5	10290.9	na
Cambodia	207.2	221.5	271.4	na
Indonesia	733.4	774.0	811.9	910.0
Lao PDR	na	na	na	na
Malaysia	4338.6	4520.4	4652.0	na
Myanmar	156.0	185.4	215.3	na
Philippines	664.1	683.0	696.3	na
Singapore	8674.0	8680.6	8844.7	na
Thailand	2443.6	2514.8	2538.8	na
Vietnamese	1206.3	1276.9	1423.7	na

Source: World Bank, World Development Indicators, https://databank.worldbank.org/source/world-development-indicators

the Provision of Energy-Efficient Solar Lamps for people who do not have access to electricity (6). With this policy, every household in remote areas gets a set of solar panels that can produce electrical energy equivalent to 32.4 *kilowatts* per hour (kWh) per month. This figure is still classified as energy poverty based on UNDP standards. Moreover, when compared to other ASEAN countries such as Brunei Darussalam, Singapore, Malaysia and Vietnam, Indonesia is also still lagging behind in terms of electricity consumption per capita (Table 1).

Looking at the gaps that exist among its member countries regarding the fulfillment of national electricity needs, ASEAN has a vision of regional cooperation to overcome energy poverty through ASEAN *Energy Market Integration* (AEMI). The target for overcoming energy poverty in the Southeast Asian region has previously been discussed in the ASEAN *Plan of Action for Energy Cooperation* (APAEC) 2010-2015. The approach formulated in APAEC to achieve its objectives includes “strengthening cooperation, creating participation in all program areas to make development gaps smaller, improving energy access, and facilitating economic integration in the ASEAN region” (2).AEMI comes from the goal of strengthening economic integration through the energy market. In its implementation, AEMI includes product liberalization and energy investment among ASEAN countries, as well as the interconnection of physical infrastructure in several regions.

Observing the challenges faced by Indonesia in meeting energy needs through electrification programs more evenly and considering ASEAN’s efforts to address the energy access gap in the region**, this study seeks to examine the relations between**

AEMI and Indonesia's policies to address energy poverty, whether the linkages are convergent or divergent.

Based on the abovementioned problem statements, this study aims to: (1) Enrich studies related to international organizations and international political economy, especially those related to regional energy market integration; (2) Review the linkages between regional agreements and policy implementation at the national level; (3) Provide an overview related to the condition of energy poverty in Indonesia in terms of the availability of access to electricity. Provide recommendations on the adjustment of energy policies at the national level with agreements between countries at the regional level.

Studies on alleviating energy poverty at the regional level and its relations to member country's policy have been carried out by several scholars. Within the framework of the 2007 "Energy Policy for Europe," the European Commission (EC) identified the principles of sustainability, energy supply security, and competitiveness as three of the main challenges of the European Union's energy policy. This framework does not explicitly mention energy poverty reduction targets. Attention to the problem of energy poverty became increasingly prominent when the EC funded the *European Fuel Poverty* and Energy Efficiency project in the period 2006-2009. This was also supported by the partnership of various agencies from the UK, France, Belgium, Italy, and Spain, who were mapping *fuel poverty* profiles in Europe. Energy poverty entered the main discussion of the European Union's energy policy after the *Third Energy Package and Vulnerable Consumers* in the 2009 Lisbon Agreement (9-10). The European Union's policy to overcome energy poverty is through the *Single Market* instrument, which is also influenced by technology and environmental policies, namely how to utilize technological innovations for the development of affordable and environmental-friendly energy.

Sheng & Shi (11) also proved that energy market integration could contribute to overcoming energy poverty issue. In a journal article entitled "*Energy Market Integration and Equitable Growth across Countries,"* Sheng & Shi (11) said that energy market integration (EMI) in East Asia has an impact on reducing income disparities among countries within the region. Thus, increasing regional economic growth. However, increasing economic growth in a region will be difficult to realize if there are still gaps in energy access among the member of the countries. More detail, Shi and Kimura (12) also argued that to create a regional energy market integration, at least must consider: (1) energy trade and investment agreements, (2) energy infrastructure development and liberalization of the national energy market, and (3) reformation of energy pricing and provision

of fossil fuel subsidies. This study seeks to see the interaction between agreements in regional cooperation and Indonesian policies, especially in overcoming energy poverty, by looking at the three aspects put forward by Shi and Kimura.

2. Methods

This study seeks to examine the relationship between AEMI and Indonesia's policy to address energy poverty by limiting the scope of the relationship to two categories, namely convergent or divergent. Policy convergence, according to Drezner (13) explains that convergence is the tendency of policies to grow more similar, in the form of increasing similarities in structure, process, and performance. Meanwhile, Knill[14] states that policy convergence is equated with policy transfer or policy diffusion that might result in increasing policy similarities across countries in a region (14). On the other hand, the situation where the policies adopted are not in accordance with collective decisions is an illustration of policy divergence (15-16).

The analysis of policy convergence or divergence in this paper is also linked to the three indicators in the integration of regional energy markets according to Shi and Kimura (12), which are then linked to the implementation of Indonesia's policies to overcome energy poverty. The three indicators referred to are (1) harmonization of regulations in energy trade and investment, (2) development of energy infrastructure, and (3) policy on energy subsidies and pricing. If the implementation of the Indonesian Government's policies is in line with the points agreed in the AEMI forum regarding these three aspects, then the nature of the relationship is convergent. On the other hand, if the implementation of the Indonesian Government's policies contradicts the points agreed in the AEMI forum, then the nature of the relationship is divergent. The model for drawing conclusions regarding the relationship between the variables in question is as follows:

To analyze the linkage between variables and indicators, this study applied a qualitative method. Qualitative methods are often considered to have no credibility in measuring the effectiveness of a program or initiative. Although qualitative methods are relatively lacking in a fixed standard such as quantitative methods in measuring effectiveness, with the right data triangulation method, qualitative methods can be a credible process. With an inductive approach, the researcher collects data, interprets it, then reports the findings in the analysis and conclusions (17).

This study uses semi-structured in-depth interviews through Focus Group Discussion (FGD). The discussion invites parties who have insights regarding AEMI cooperation

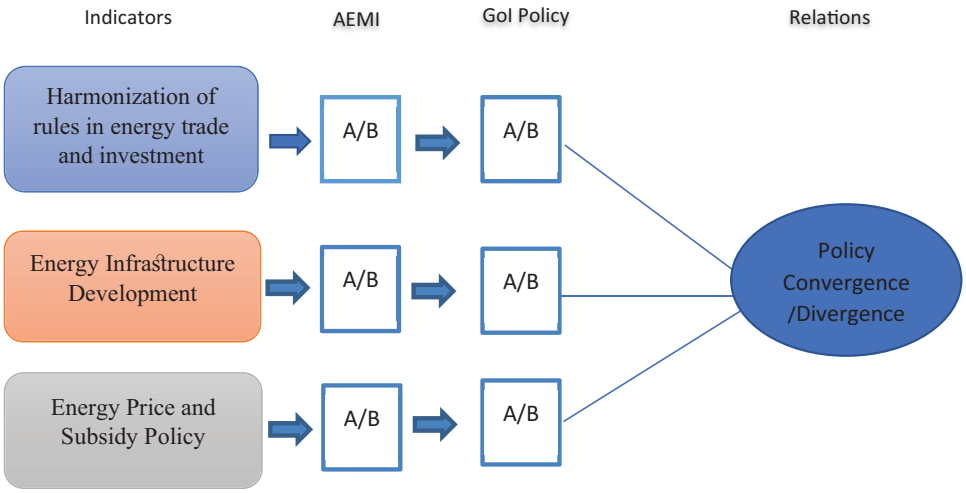

Figure 1: Analysis Model (constructed by the author).

and Indonesian policies in adopting the AEMI cooperation agreement, especially in the context of alleviating energy poverty. The interview invited a development economist from the Indonesian Institute of Sciences (LIPI), Dr. Maxensius Tri Sambodo. The research team also conducted a search on documents related to AEMI and Energy Poverty in Indonesia, both before the FGD and after it, as an effort to cross-check, analyze, and draw a conclusion whether the link between AEMI cooperation and Indonesian policies is convergent or divergent.

3. Results and Discussion

Energy poverty remains a challenge for Indonesia. Among Indonesia's 272 million population, around 25 million people still do not have access to electricity (18). The phenomenon of energy poverty in Indonesia is mostly experienced by those who live in rural areas. These areas are geographically isolated, so that they are difficult to reach by transmission networks as well as transportation access. The isolation of this region is further supported by the level of economic poverty, which increases the difficulties for people living in disadvantaged areas to get adequate access to energy. There are at least four provinces which access to electricity is still in the range of 96% in 2018, namely East Nusa Tenggara, Maluku, Papua, and West Papua, although it is also possible that other parts of Indonesia still have limited access to electricity, especially border areas. In general, there are still around 2,277 villages/nagari that do not have access to electricity (about 3% of national access). This condition certainly has not reached the

Government's target as stated in the National Electricity General Plan (RUKN), namely the achievement of the national electrification ratio of up to 100% in 2020 (19).

In addition to the problem of unevenly distributed access to electricity, Indonesia also has an issue of limited access to the use of clean energy for cooking. Through his presentation at the Development Study Forum, Sambodo (19) explained that around 28% of rural residents in Indonesia still use firewood for cooking. In 2018, for example, it was recorded that 85 million Indonesians still did not have access to clean energy sources for cooking, and 55 million people still used traditional biomass energy. The condition of unequal access to electricity and clean cooking illustrates that the energy poverty issue still exists in Indonesia.

The Government, in this regard, has made various efforts to address the inequality of access to modern energy. One of them is through the Special Allocation Fund (DAK) for Rural Energy, namely funds sourced from the State Revenue and Expenditure Budget (APBN) for renewable energy development activities in certain areas. The DAK provision is covered by Regulation of the Minister of Energy and Mineral Resources Number 36 of 2018 concerning Operational Implementation of the Physical Special Allocation Fund for Small-Scale Energy (20).

Apart from the DAK and various regulations that support equitable access to energy, the Government's effort to overcome energy poverty in Indonesia is also implemented through infrastructure development programs. Through Presidential Regulation No. 47 of 2017, the Government held an Energy Saving Solar Lamp (LTSHE) program which aims to supply electricity to border areas, underdeveloped areas, isolated areas, and outer islands, which can be accessed free of charge by the local community. As of 2019, around 360,429 households in remote villages have received electricity supply through this program. Sambodo (19) argues that the LTSHE program does not meet the standards of the World Energy Agency because its implementation is still limited to provide lighting and charging cellular phones and cannot be used for other electronic equipment. In other words, the average annual electricity consumption per family of new LTSHE users is around 389 kWh, far below the 1250 kWh standard set by the World Energy Agency (18).

Given the limitations of the Indonesian Government in overcoming unequal access to energy and the low average annual electricity consumption per LTSHE beneficiary family, in this case, more strategic steps are needed to overcome energy poverty in Indonesia. One of the efforts that can be considered is the integration of the energy market within the framework of regional cooperation.

3.1. ASEAN Energy Market Integration and Rationalization for Indonesia

The ASEAN Energy Market Integration (AEMI), in this case, offers an alternative solution to the problem of energy poverty. The strong linkage between AEMI and energy poverty can be seen in macro and micro aspects. In the macro aspect, energy market integration can contribute to national economic development by equalizing the level of growth of countries in the region. This will not be achieved without first addressing one of the root causes, namely energy poverty and limited access to energy (micro aspects). In general, AEMI has a target to achieve an even distribution of energy in all ASEAN member countries at affordable prices and minimal impact on the environment so that regional economic integration can be achieved and competitiveness increases. This is expected to reduce the cost of production and the use of electricity, facilitate regional investment in infrastructure projects (especially electricity development projects) and provide adequate energy reserves in the long term.

In general, AEMI is projected to be a deeper regional energy market integration scheme than the agreement in APAEC. The AEMI Forum, which has been held since 2013, is quite detailed in discussing the development of electricity infrastructure and new and renewable energy, as shown in Table 2 below:

The Implementation of Agreement in the Electricity Sector

In the electricity sector, AEMI is a big umbrella for the implementation of AEE, which includes transnational electricity trading. Harmonization of standards and regulations for regional market integration is related to intra-regional electricity trade. This harmonization is important to balance the role of the state to be able to organize an open, competitive, and transparent energy market (21). In the ASEAN Power Grid (APG) scheme, Indonesia has committed to support cross-border power projects together with Singapore and Malaysia. There are two important regulations issued in Indonesia related to this agreement. First, the Government of Indonesia issued Government Regulation (PP) No. 42 of 2012 concerning the Sale and Purchase of Transnational Electricity which was stipulated, promulgated, and enforced on March 12, 2012. Second, the Government of Indonesia, through the Ministry of Energy and Mineral Resources (KESDM), issued Ministerial Regulation no. 26 of 2012 concerning the Regulation of the Minister of Energy and Mineral Resources concerning Procedures for Application for Sales Permits, Purchase Permits, and Interconnection Permits for Cross-border Electric Power Networks, which were enacted, promulgated and enforced on October 30, 2012. This regulation is also related to the *Power Exchange* agreement. *Agreement* (PEA)

Table 2: Agreements in the AEMI Forum

No.	Year	Deal
1.	2013 in Bangkok	AEMI initiation under the ASEAN Studies Center (ASC) and the Faculty of Economics, Chulalongkorn University, Thailand. The establishment of the AEMI Group consisting of academics from all ASEAN member countries to collaborate and design the implementation of AEMI, under the pillars of the ASEAN Economic Community (AEC).
2.	2014 in Bangkok	AEMI Group agrees to: Compile components of the AEMI blueprint and roadmap Identification and analysis of energy issues in ASEAN countries through the publication of *working group papers*. Funding of the AEMI initiative from a grant provided by the Norwegian Ministry of Foreign Affairs from December 2014-June 2016. Donors through *The Norwegian Institute of Foreign Affairs are* also involved in the development of small-scale renewable energy.
3.	2015 in Bangkok	AEMI Forum agrees on efforts to address the issue of energy prices and subsidies AEMI Forum agreed to develop *ASEAN-wide tools and methodology* for: Projecting the impact of removing energy subsidies on the poor and limiting *energy pricing*. Develop 10 *Computable General Equilibrium* (CGE) *models* for each ASEAN member country. Develop relevant policy recommendations as to the basis for APAEC 2016-2025 recommendations.
4.	2015 in Jakarta	The AEMI Forum agreed to focus on the issue of developing new and renewable energy starting from project initiation, investment, full technology transfer, and welfare impacts through discussions on energy poverty and *small-scale renewable energy.*
5.	2015 in Singapore	Development of discussions related to AEMI which is the umbrella for the ASEAN Power Grid (APG) project to achieve ASEAN Connectivity. Encourage electricity trade between ASEAN countries by involving discussions between relevant entities, such as ASEAN Center for Energy (ACE) and Heads of ASEAN Power Utilities and Authorities (HAPUA)
6.	2016 (Special Meeting with Senior Officials Meeting on Energy (SOME))	Approval on the formulation of a legal standard framework related to multilateral commercial agreements. Development of approaches and studies to encourage regional operations based on commercial modes, as well as assistance to member countries in the elimination of electricity price subsidies.
7.	2016 (Meeting with HAPUA in Jakarta)	The agreement to create the ASEAN Electricity Exchange (AEE) which is expected to be a corridor for: Carry out sales of excess electricity production. Opening opportunities for *resource sharing* between countries whose electricity production is not balanced. Balancing services more cost-effectively through trade between countries rather than total production by the country itself. After the feasibility study, AEE is expected to be the coNREstone of the operation of the APG based on multilateral agreements in 2018.
8.	2017 (Meeting with HAPUA and UNESCAP in Jakarta)	The determination of the AEE principle is based on the "ASEAN Model," namely: Adopt a wise move and voluntary approach to join the first AEE implementation. Allows countries that have more electricity supply to participate in *excess trade* voluntarily and does not need to change the country's energy security achievement system, including national pricing and privatization Establish incentives to develop regional electricity infrastructure through a *shared costs-benefit* mechanism by member countries. Develop a pricing model at the regional level for trade between countries in a transparent, efficient, and predictable manner. Securing a larger and more optimal deployment of new and renewable energy in order to facilitate ASEAN communities that do not have access to electricity or clean energy sources. (Indonesia is focused on developing geothermal energy sources).

Source: processed from http://www.asean-aemi.org/wp-content/uploads/2015/05/AEMI-Book-Final1.pdf

between Sarawak Energy Berhad (SEB) in Malaysia and PT. PLN Persero in Indonesia on July 19, 2011, ago. These two regulations show the commitment of the Government of Indonesia in the form of a legal basis to address the unmet condition of electricity demand in the outermost regions.

Another impact of the issuance of this regulation - besides facilitating the distribution of electricity - is to facilitate private *power plant companies (IPPs*) to participate in transnational trade. This regulation also discusses the procedure for issuing an Electricity Supply Business Permit (IUPTL), which is under the responsibility of the Directorate General of Electricity, MEMR. This regulation allows for collaboration between the Government and the private sector in providing electrical energy for people whose areas do not have sufficient supply (22). As of September 2020, there are more than 50 holders of electricity supply business areas, with details of more than 40 businesses operating, and the rest are still being developed (23).

The existence of this Government Regulation and Ministerial Regulation is one concrete evidence that the Government of Indonesia is also working towards the convergence of national regulations to regional agreements related to the liberalization of electricity trade among Southeast Asian countries. In addition to its function to support electricity trade between countries, the facilitation of IUPTL for private electricity providers has increased investment from non-state actors and achieved greater electrification targets for the outermost regions in Indonesia. This can be seen from the MEMR report at the beginning of 2021 regarding an increase of 14.86% in the number of households that are electrified, the addition of power plants to 2,866.6 Megawatts, and the extension of electricity transmission to more than 2500-kilometer circuits (24).This is also supported by an increase in investment in the electricity sub-sector, which reached US$ 7 billion. This development in the electric power sector ultimately has a *spillover effect* on the infrastructure development of more than 90 public electric vehicle charging stations in 60 locations.[24]

3.2. The Implementation of Agreement in the New Renewable Energy Sector

In addition to the initiative to liberalize trade in the electricity sector, the AEMI Forum also discussed *renewable energy.* In June 2015, AEMI Group held a meeting in Jakarta to discuss relevant policy recommendations to overcome energy poverty through the development of renewable energy, both *on-grid* and *off-grid* (25). This discussion was then continued until a meeting with HAPUA in 2017 when initiating AEE. Based on

the consolidation, there are at least two main agreements to develop NRE, namely: (1) Implementation of commitments to develop NRE and (2) Development of small-scale energy sources to accommodate the people of outermost areas so that they can access electricity. These two agreements are expected to accelerate the reduction of energy poverty conditions in ASEAN countries.

The first agreement relates to the implementation of commitments for NRE development which are detailed under the agreement in APAEC 2016-2025. In the long term, the implementation of this commitment is expected to consider the environmental impact and inclusiveness of women's issues in the energy sector (25). However, until now, many ASEAN member countries have focused their attention on the relationship between energy issues and environmental sustainability, especially those directly related to the phenomenon of climate change. This is indicated by the encouragement to increase public awareness of the importance of the energy transition to NRE through promotion and research (26).

APAEC 2016-2025, which later became the reference for implementing the joint commitment to achieve this energy transition, outlines at least five main strategies.[26] First, ASEAN countries must encourage the energy transition to 23% of the use of NRE from the total main energy supply by 2025 based on policies and roadmaps for NRE development. Second, there is a cooperation between *stakeholders* at the regional and international levels to intensively carry out dialogue on NRE development. Third, strengthening the research and development of NRE technology by involving research institutions or universities. Fourth, increasing the funding scheme for NRE development at the national, regional, and international levels. Fifth, seek commercial use of biofuels.

In response to the five strategic agreements at the ASEAN level, the Government of Indonesia, through the Presidential Regulation no. 22 of 2017 concerning the General Plan of National Energy, has briefly discussed the use of NRE, which is supported by the Minister of Energy and Mineral Resources Regulation No. 39 of 2017 concerning the Implementation of Physical Activities using New and Renewable Energy and Energy Conservation. Previously, the Government of Indonesia, through the Presidential Regulation No. 5 of 2005 concerning the National Energy Policy, has confirmed the target of the national energy mix in 2025 by using 17% NRE. This regulation also supports the Green Energy Policy through Ministerial Regulation No. 2 of 2004. Several regulations related to NRE can also be found separately, such as Law no. 30 of 2007 on energy, UU no. 30 of 2009 concerning electricity, and Law no. 21 of 2014 concerning Geothermal Energy.

Even though at the national level, the Government of Indonesia already has a series of regulations regarding the development of NRE, it is also necessary to update them based on international agreements. Therefore, the Government of Indonesia, through the House of Representatives (DPR) Commission VII, has made the issue of NRE development a national legislation program (Prolegnas) in 2021. The NRE proposal as a National Legislation Program is intended to be the key to accelerating the development of NRE in Indonesia (27). Thus, when this bill becomes a law, there is urgency for all Indonesian people to achieve its targets.

Based on the draft of the NRE Bill that was drafted in 2018 and published by the DPR on its official website (28), the five strategies in APAEC have been discussed in detail. One of the key issues that will be discussed in this NRE Bill is to affirm the Government's target of achieving 23% NRE in the national energy mix, which is in line with the agreement in APAEC 2016-2025 (29). Furthermore, cooperation between *stakeholders is* also discussed in Chapter V Part Three concerning the exploitation of Article 17 related to the export and import of NRE sources. In Chapter VIII of the NRE Bill, Research and Development are discussed in articles 29-31. In connection with the fourth strategy in APAEC 2016-2025, the NRE development funding scheme is planned to be regulated in Chapter X related to incentives article 34, and Chapter IX related to new and renewable energy funds article 35. Meanwhile, this NRE Bill does not discuss in detail the commercialization of biofuels because it is more general in nature which applies to all types of NRE mentioned in it. This commercialization is regulated in Chapter IX Article 32 and Article 33 concerning New and Renewable Energy Prices by considering input rates, market index prices, and reverse auction mechanisms.

Although the NRE Bill has not yet been ratified, the formulation of this bill shows that the Government of Indonesia has made efforts to internalize regional agreements into national regulations legally and formally. Every item contained in the NRE Bill shows a convergence with the ideas discussed in the ASEAN forum. Therefore, the support of all Indonesian people is needed to oversee the ratification of this bill to become law so that the implementation of NRE development can be carried out optimally. With the NRE Law in the future, the community can participate as actors who are able to play an active role in carrying out the regulations related to NRE, which have also been in effect previously.

Furthermore, **the second agreement** that emerged in the AEMI forum was to promote small-scale NRE resources to support the needs of the people of the outermost regions. This can be seen from the results of the 2015 AEMI Forum discussion in Jakarta. The difficulty of providing main electricity sources at the national level will later

be answered by the availability of small-scale NRE sources in supplying electricity. This small-scale renewable energy source is also expected to be one of the solutions to energy poverty in the long term.

Previously, the Government of Indonesia had enacted regulations related to this issue through the Decree of the Minister of Energy and Mineral Resources No. 1122 K/30/MEM/2002 concerning Guidelines for the Concession of Distributed Small-Scale Power Plants. This Ministerial Decree regulates more about the coordination between small business owners and PT. PLN to operate and operate the power plant. To date, this provision has not undergone any special updates. Meanwhile, related to the agreement at the regional level, the Government of Indonesia, through the Minister of Energy and Mineral Resources Regulation No. 16 of 2020 concerning the Strategic Plan of MEMR for 2020-2024. The Ministerial Regulation discusses the planning of small-scale NRE-based power plants, such as Micro Hydro Power Plants (PLTMH), Small-Scale Coal Steam Power Plants (PLTUB-SK), and Small-Scale Geothermal Power Plants (PLTP). Some of these small-scale power plants have also been implemented in various regions in Indonesia based on the potential of NRE that is there. One example is the Small-Scale PLTP in Kamojang, West Java which was developed based on the idea of the Agency for the Assessment and Application of Technology (BPPT), which is an institution in the Non-Ministerial Government under the coordination of the National Research and Innovation Agency (BRIN) (30).

Unfortunately, as mentioned above, this issue is still in the national strategic plans. The discussion regarding the development of small-scale renewable energy sources has not been carried out in detail according to the general rules. In other words, there is no specific regulation or law regarding small-scale NRE sources that can be the legal basis for the implementation of the development of these sources by various parties. However, the discussion that is still general in nature can still be classified as a derivative of convergent regulations in accordance with the agreement in the AEMI Forum.

3.3. Indonesia's Commitment in the Development of Electrical Energy Infrastructure

Within the framework of the 2010-2015 APAEC cooperation, an agreement was formulated to develop energy infrastructure, including through the ASEAN *Power Grid* (APG), Trans-ASEAN *Gas Pipeline* (TAGP), and *Clean and Clean Coal Technology* (CCCT). These three energy infrastructure development concepts aim to build connectivity among regional countries, which in turn can support integration targets. Because AEMI

is a continuation of APAEC, it can be said that the country's commitment to realizing infrastructure development projects under the APAEC framework also determines the effectiveness of AEMI, including in overcoming energy poverty in the region.

Back to energy poverty which is closely related to limited access to modern energy sources, then one solution to overcome it is through electrification programs. APG is a regional electricity network interconnection project that has been initiated since the formulation of ASEAN Vision 2020 in 1997 with an emphasis on the "patchwork" mechanism, where a country can supply electricity to other ASEAN countries that have limited access through trade.

Just like commodity trading in general, the APG project also involves various harmonization of regulations at the national, regional, and even international levels in terms of licensing, regional borders, taxes, quality standards, environmental standards, and so on. Sambodo, Navarro, and Binh[10] argue that progress from the realization of energy infrastructure development projects tends to be slow. This is due to budgetary constraints, technical problems, and differences in industrial policy frameworks among ASEAN countries. There needs to be an approach aimed at increasing competitiveness in the domestic energy market. Meanwhile, most ASEAN countries still prioritize the monopolistic role of their national energy companies, thereby reducing the attractiveness of investors to invest in project development (10).

Indonesia's commitment to the APG is demonstrated through bilateral cooperation with Malaysia through a power grid construction project that connects Sumatra to Peninsular Malaysia (P4) and Sarawak to West Kalimantan (P6). Multilaterally, Indonesia also agreed to build a power network connecting Batam, Bintan, Singapore, and Johor (P5). The development of electrical interconnection projects has also been discussed trilaterally between Singapore, Johor and Riau, as well as between Indonesia, Malaysia and Thailand. In the 3rd APAEC forum (2010-2015), Indonesia's commitment was further expanded with a new agreement to build an infrastructure project connecting East Sabah and East Kalimantan. However, as revealed by Sambodo, Navarro, and Binh (10), progress on the realization of this energy infrastructure development project tends to be slow. For example, the acceleration of preparation for the implementation of the new P4, P5, and P6 is discussed in this 3rd APAEC. This delay is caused by budgetary constraints, technical problems, and differences in the industrial policy framework among ASEAN countries. But at least, Indonesia's commitment has shown that Indonesia is trying to adopt the points of agreement to realize the integration of the ASEAN energy market.

In relation to the procurement of electrification programs in remote areas, Indonesia also explores the development of the NRE, in line with the commitment within the

framework of regional cooperation to create equitable access to energy. Throughout the year of 2019, for example, Indonesia increased its target of 385 Megawatts (MW) from NRE sources, marking an increase of 3% from the previous year. The Government has also added several new power plant projects originating from geothermal (PLTP) and solar power (PLTS), including PLTP Muara Laboh (85 MW), PLTP Sorik Marapi Unit I (42.3 MW), PLTP Lumut Balai Unit 1 (55 MW). MW), PLTS Likupang (15 MW), PLTS Lombok (15 MW), and PLTB Jeneponto (72 MW) (31).

Although in the last six years the REN development capacity for power plants in Indonesia has increased by 2.09 gigawatts (GW), the contribution of NRE itself is still relatively small in terms of generation, which is 12.2%. Based on the IESR report(31), the capacity of solar energy built by Indonesia has only reached 152 MW (0.028%) of the total potential of 536 GW. Of the 152 MW capacity built, 11% is rooftop solar photovoltaic (PV) (31). In rural areas, the Government only installed 28.2 MW of solar PV, 480 kilowatts (kW) of wind energy, and 6.38 MW of off-grid micro-hydro systems (32). The obstacles faced by the Government in the success of the national electrification program in rural and disadvantaged areas are related to geographical conditions, economic activities of rural communities, funding schemes, and market structures, where often the Independent Power Producers (IPPs) feel that the State Electricity Company (PLN) hampers the transfer process of Business Areas (31). Despite these obstacles, the Government has actually shown efforts to develop energy infrastructure in order to create more equitable access to energy, in accordance with AEMI's target. This is enough to prove the existence of policy convergence between the regional and national levels.

3.4. The Dilemma of Indonesia's Energy Subsidy Policy

One of the things that can hinder the integration of energy markets at the regional level is the state subsidy policy. Energy subsidies are a form of government intervention that basically aims to lower production costs, increase the income of energy producers, and lower the selling price that must be paid by consumers. Thus, through subsidies, the price of domestic energy products is relatively low. To a certain degree, this state subsidy policy can help improve social welfare and create jobs, as well as support the development of new energy sources, which in turn can support energy security. On the other hand, excessive subsidy policies can divert government budgets from services that are essential and productive, reduce the competitiveness of energy products, widen opportunities for rent-seeking practices, and reduce efficiency levels from both demand

and supply sides. In addition, as previously explained, energy subsidies cause sluggish investment at the macroeconomic level, become a burden on state expenditures at the fiscal level, and widen economic inequality at the social level, and hinder the development of clean energy technology (33).

A study made by the AEMI group(34) in 2015 confirmed that the pricing of different electrical energy due to significant differences in applying subsidies is a challenge for ASEAN to form an integrated energy market at the regional level (24). Energy subsidies lead to sluggish investment at the macroeconomic level, a burden on state spending at the fiscal level, further widening economic inequality, as well as hindering the development of technology for clean energy in the environmental sector. Therefore, in order to develop relevant policies achieving the targets in APAEC 2016-2025, member governments should consider removing energy price subsidies without harming the poor (25).Even though it has not been stated in an international agreement that is legally valid and formal, the vision to abolish energy subsidies has begun to be discussed by ASEAN member countries to be tested for feasibility.

The subsidy policy in Indonesia for the 2010-2014 period tends to increase (Figure 1), even the value of subsidies in the energy sector exceeds subsidies in the education and health sectors (19). This energy subsidy is divided into three categories, namely fuel oil (BBM), LPG, and electricity. In 2015, energy subsidies decreased to Rp 119.09 trillion overall, compared to the previous year of Rp 341.82 trillion. This decrease was caused by the Government's policy that stipulates the transfer of subsidies for the Premium type of Fuel Oil (BBM), which is considered not right on target. The year 2020 showed the lowest subsidy value in a decade since 2020, which was IDR 102.3 trillion, although it began to show an increase again in 2021 to IDR 110.5 trillion. This is due to a decrease in the number of realized subsidies from the budgeted amount due to the Covid-19 pandemic (35).

The Indonesian Government has actually carried out a campaign to slowly reduce subsidies in the electricity sector for households and businesses in 2014. From these efforts, the Government has succeeded in saving government spending by more than 2% (36). But on the other hand, the Government of Indonesia still seems to set subsidies as an effort to overcome economic inequality in society. As written in the Regulation of the Minister of Energy and Mineral Resources No. 26 of 2016 concerning the Mechanism of Providing Electricity Tariff Subsidies for Households, the Government of Indonesia provides subsidized electricity tariffs for household purposes with a power capacity of 450 VA (approximately 24 million households) mainly for frontier, outermost or disadvantaged areas, and 900 VA (approximately 24 million households). poor and

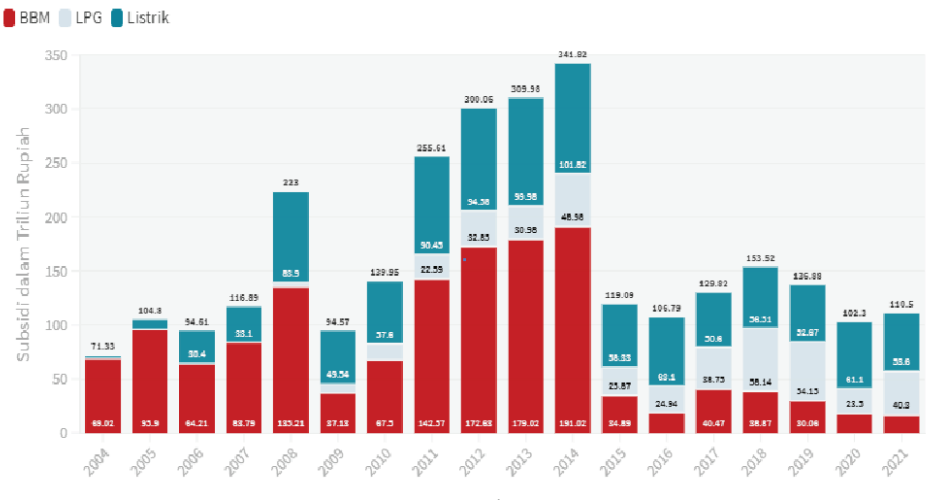

Figure 2: Indonesian Energy Subsidy. (*Source: transitionenergi.id, 2021*).

vulnerable categories, around 6.5 million households) (19). This stipulation is in line with the Minister of Social Affairs Regulation No. 10 of 2016 concerning the Mechanism of Using Integrated Data for the Poor Handling Program in accelerating the handling of the poor. In providing subsidized electricity tariffs, the MEMR collaborates with the directors of PT. PLN (Persero) mainly in the implementation and also routine reporting.

During the two years of implementing the energy subsidy policy, the regulation was finally amended in 2018 through Minister of Energy and Mineral Resources Regulation No. 32 of 2018. This change in regulation actually accommodates the provision of subsidies with a wider reach. This can be seen in the provision of electricity subsidies for household consumers with a power of 900 VA-RTM (Poor Households). In fact, consumers of this category are economically capable of increasing their household consumption power to 1300 VA and above. Even in 2017, PT. PLN (Persero) also noted that there were 18.7 million customers who should no longer be eligible to enjoy 900 VA subsidized electricity (37). Meanwhile, in 2020, the Government of Indonesia is increasingly unable to let go of its subsidy policy due to the impact of the global pandemic. A report from the ASEAN Center for Energy stated that the 50% subsidy provided for 900 VA customers and 100% for 450 VA customers was extended until December 2020, from the initial policy, which was only valid until June 2020 (38). This condition has become a paradoxical or divergent note, which can be seen from the regulations of the Government of Indonesia in implementing subsidies when faced with an agreement to realize AEMI.

4. Conclusion: Towards A Convergence or Divergence Pathway?

Based on the previous explanation, it can be concluded that there are at least 3 out of 4 regional agreements that are convergent with existing regulations in Indonesia, mainly on the 2 issue areas discussed by the AEMI Forum. The three agreements are harmonization of regulations related to cross-border trade and liberalization in electricity issues: implementation of the commitment to developing NRE and small-scale NRE, as well as the development of supporting infrastructure for energy procurement, especially electricity. One rule that is still divergent is related to the implementation of energy subsidies, the elimination of which will trigger extreme dynamics at the grassroots level. There are rules at various levels that become formal legal documents in Indonesia related to these three things, both at the level of ministerial regulations to laws. Thus, it can be concluded that there is a tendency of policy convergence between the AEMI agreement and the implementation of policies by the Government of Indonesia to overcome energy poverty. Even though there are several regulations that are still in the consolidation stage in the legislative body, the Government's efforts to align its commitments with the results of coordination at the regional level can be said to have increased gradually.

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