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MAPPING INDONESIA'S READINESS FOR ASEAN ENERGY MARKET INTEGRATION (AEMI): ANALYSIS OF POLICY HARMONIZATION AND INFRASTRUCTURE DEVELOPMENT IN THE ELECTRICITY SECTOR

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ABSTRACT
As a form of commitment to realizing inclusive access to modern energy and reducing greenhouse gas emissions to achieve sustainable development goals as stated in the Paris Agreement, the Association of Southeast Asian Nations (ASEAN) has designed and implemented various energy cooperation programs at the regional level. Through the ASEAN Plan of Action on Energy Cooperation (APAEC), the ASEAN countries emphasize the regional interconnectivity agenda through infrastructure development projects, one of which is the ASEAN Power Grid (APG). However, there are still several obstacles in the implementation of cooperation under the APAEC framework, namely the absence of a coherent institutional and regulatory framework, as well as differences in tariff, taxes, and energy pricing policies among ASEAN member countries. ASEAN Energy Market Integration (AEMI) is a recommended scheme for strengthening and deepening the established regional energy cooperation under the APAEC framework. This study attempts to analyze Indonesia's readiness to face the discourse on the formation of AEMI, particularly in the electrical energy sector, by using two indicators, namely the harmonization of policies and regulations, and infrastructure development. Using qualitative methods and semi-structured in-depth interview techniques, this study seeks to explore whether the regulations enacted by the Government of Indonesia comply with regional agreements, and to what extent the Government of Indonesia has committed to regional infrastructure development. This study concludes that Indonesia has made efforts to harmonize policies and established agreements on the APG framework with other ASEAN countries. However, Indonesia still needs to map its perception of the need for energy comprehensively and look for the right form of coordination among related institutions to gain more advantages in the ASEAN energy market integration.

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1. INTRODUCTION

Energy is crucial in meeting human necessities, from the most basic to more complex industrial needs. Energy is also seen as a “golden thread” that connects various aspects of development, such as economy, health, education,

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and the environment (UNESCAP, 2020). However, energy is also a major contributor to greenhouse gas emissions. Therefore, the policies of each country to use or limit energy will have a direct impact on achieving sustainable development.

"No One Left Behind" has become a slogan of choice for realizing the Sustainable Development Goals (SDGs) by 2030. Inclusive or accessible access is a global goal to reduce inequality in all aspects related to the other 17 SDG goals. This goal covers the fundamental aspects of everyday life, among others; economic, social, environmental, as well as politics and the government. Of the 17 SDG goals, access to modern energy is one of the main pillars that must be achieved. This is contained in the 7th goal, namely: "Ensure access to affordable, reliable, sustainable, and modern energy for all". To expand access to energy, improving energy efficiency and investing in renewable energy are two crucial things to do.

One form of the countries' commitment to realizing the 7th sustainable development goal is the signing of the Paris Agreement. Adopted by 196 countries at COP21 in Paris on 12 December 2015 (UNCC, n.d.), the Paris Agreement is an agreement that has binding legal force[1], which aims to reduce global warming to below 2 degrees Celsius according to the recommendations set out in the Intergovernmental Panel on Climate Change (IPCC).

The ten ASEAN countries are among those that have ratified the Paris Agreement. This shows that ASEAN countries are concerned about the achievement of energy efficiency and the development of new and renewable energy (NRE) to reduce greenhouse gas emissions. Each ASEAN country has developed a "Nationally Determined Contribution (NDCs)" scheme as a form of commitment to reducing greenhouse gas emissions. This NDC illustrates the close relationship between energy and the environment through various state energy policies in supporting the global agenda (UNESCAP, 2020).

With a population of around 661 million people and massive economic growth, Southeast Asia is a region that has the potential to become a global economic powerhouse. This correlates with the need for energy, starting from the domestic level of member countries, which then accumulates at the regional level. The energy demands of the ASEAN countries increased sharply to almost 80% between 2000 and 2017 (UNESCAP, 2020). Fossil energy, particularly oil, dominates the energy demand mix of the ASEAN countries besides natural gas and coal. The utilization of renewable energy in the Southeast Asia region mainly comes from traditional biomass energy, which is used for cooking and heating. Other forms of renewable energy, such as hydropower, geothermal, and solar power are still in the early development stage.

Amid massive economic growth and energy use, the ASEAN countries face some challenges in achieving sustainable development due to environmental pollution and unequal access to modern energy. The increase in the Gross Domestic Product of the ASEAN countries by approximately 46% between 2000 and 2017 was also accompanied by worsening air quality caused by the combustion of fossil fuels from the industrial, transportation, and household sectors (Lee, et al., 2018). The annual per capita carbon dioxide emissions increased from 1.3 tonnes in 2000 to 2.1 tonnes in 2017, indicating the dual effect of the increase in per capita energy use and dependence on carbon energy sources (IEA, 2019). In addition to environmental problems, ASEAN is also plagued with the condition of unequal access to modern energy. About 130 million people in Southeast Asia still lack access to electricity. Approximately half (45 percent) of Southeast Asia's population still also relies on traditional biomass fuels for cooking (AEMI, 2015).

While several ASEAN countries have shown rapid progress in increasing electrification rates in the last two decades, several other countries, such as Cambodia and Myanmar, tend to have slower pace of development. Some rural areas in the Philippines, Laos, and Indonesia also have limited access to electricity. Only four ASEAN countries reach100 percent of electrification in urban areas, namely Singapore, Malaysia, Brunei Darussalam, and Vietnam (Navarro, Sambodo, Todoc, 2013, 2). Based in the IEA estimation, around 63 million people in Southeast Asia will still face the problem of limited access to electricity by 2030 (IEA, 2009).

Faced with the region's internal challenges as well as global demands to reduce greenhouse gas emission levels, ASEAN has built frameworks for cooperation in the energy sector that are oriented towards efficiency and sustainability. Regional cooperation in the energy sector has been explicitly included in the "ASEAN Vision 2020" published in 1997. It was the forerunner of the idea of building an energy network across national borders. By emphasizing the principle of connectivity, ASEAN mapped out the Master Plan on ASEAN Connectivity (MPAC) as the basis for infrastructure development and the development of an institutional framework within the region (ASEAN Secretariat, 2010). The measure was supported by the formulation of the ASEAN Plan of Action for Energy Cooperation (APAEC), a 5-year program implemented since 1999. The approach planned in APAEC to attain its purpose includes "strengthening cooperation, participating in all program areas to reduce development gaps, improving access to energy, as well as facilitating economic integration in the ASEAN region" (Navarro, Sambodo, & Todoc, 2013, 8). APAEC underlines several aspects of regional connectivity and integration to achieve energy security, including inclusive access, affordability, and sustainability, in line with the 7th SDG Goal. This goal can be achieved

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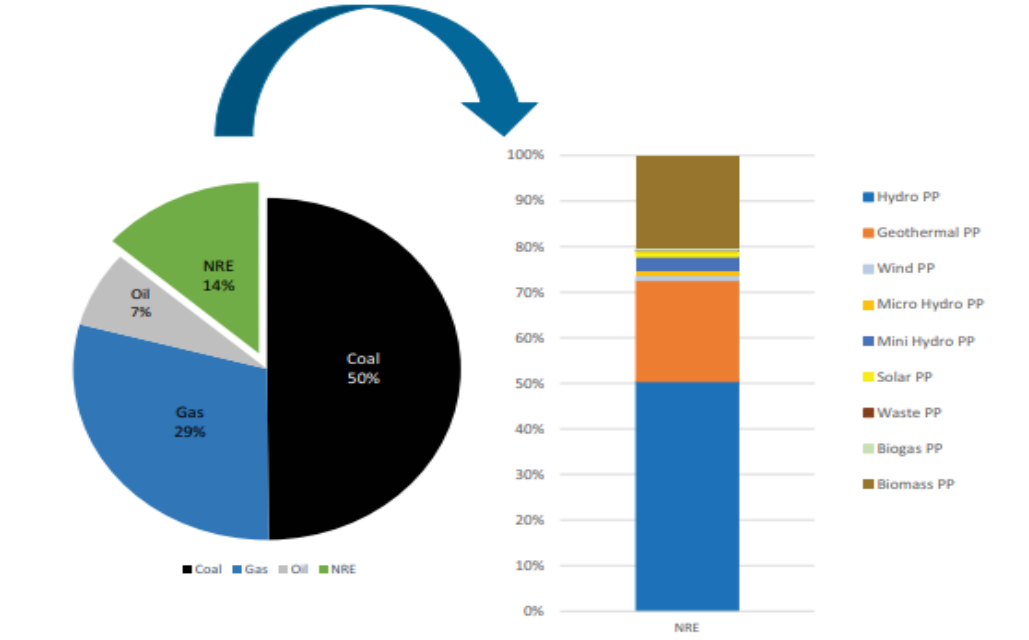
through infrastructure development and the development of renewable energy supported by a harmonious regulatory framework. Two flagship programs of APAEC related to infrastructure development are the ASEAN Power Grid (APG) and the Trans-ASEAN Gas Pipeline (TAGP). APAEC 2016-2025 also discusses the priority to realize 23% of the use of renewable energy in ASEAN's primary energy mix by 2025 (UNESCAP, 2020).

To further establish interconnectivity and to strengthen regional energy security, some experts and technocrats of the ASEAN countries commenced the idea of ASEAN Energy Market Integration (AEMI). The ASEAN Trade in Goods Agreement (ATIGA) and the ASEAN Comprehensive Investment Agreement (ACIA) are the two foundations for the realization of AEMI. AEMI is expected to include market liberalization and investment in the energy sector among the ASEAN countries. Moreover, the interconnection of physical infrastructure between the ASEAN countries also becomes the noteworthy agenda of AEMI. To align with the AEMI-planned cooperation scheme, the ASEAN countries need to adjust some policies in the context of (a) liberalization of trade and investment in the energy sector, (b) domestic energy market restructuration, (c) harmonization of rules in the energy sector, and (d) coordination of the planning and development (Navarro, Sambodo, & Todoc, 2013, 10-13).

As a country with the largest population in Southeast Asia, Indonesia encounters the challenge of meeting the need for stable and affordable energy. Indonesia's energy demand is projected to increase paralleling the rate of economic, social, and population growth. In this case, the electricity sector plays an important role in socio-economic development in Indonesia. The demand for electricity has increased by an average of 7.1% per year since the late 2000s, from 134.6 Terra Watts/hour (TWh) in 2009 to 245 TWh in 2019 (web.pln.co.id). In response to this constant increase in demand for electricity, the Government of Indonesia has a target to build power supply infrastructure through various Fast Track programs to achieve an electricity supply of 137 Giga Watt (GW) by 2025. The government's policy to meet domestic electricity demands is quite successful considering that the national electrification rate has reached 98.3% by the end of 2018 (Halimatussadiah, Siregar, & Maulia, 2020).

However, there are at least two challenges that are still faced by the Government of Indonesia in implementing the national electrification program. First, Indonesia still depends on fossil energy sources to prop up the national electricity supply. Based on the data obtained in the 2019 Indonesia Energy Outlook, until 2018, power generation capacity in Indonesia was primarily derived from fossil energy, with coal rank the first (50%), followed by natural gas (29%), and petroleum (7%). The rest, around 14%, comes from the use of Renewable Energy (Graph 1). As a country that also ratified the Paris Agreement, Indonesia must demonstrate its commitment to reduce greenhouse gas emissions. Indonesia has designed an NDC with a target of reducing greenhouse gas emissions by 29% by 2030 and increasing renewable energy capacity in the primary energy mix to 23% by 2025 (Halimatussadiah, Siregar, & Maulia, 2020; MEMR, 2017).



Graph 1. Indonesia Power Plant Installation Capacity per Energy Type in 2018
Source: DEN, 2019; HEESI, 2018

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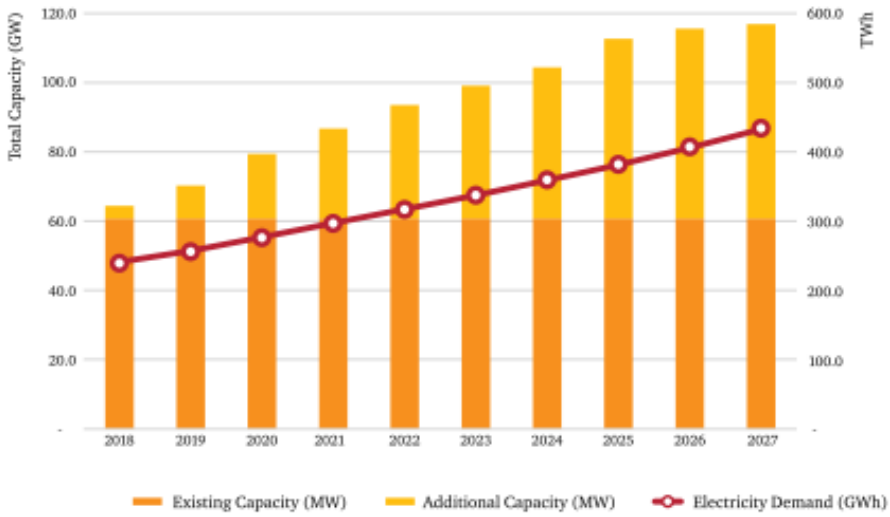
Besides dependence on fossil energy, Indonesia also meets a challenge related to equitable access to modern energy sources. Having over 18,000 islands (PWC, 2018), Indonesia still experiences unequal distribution of electricity. Some provinces in Indonesia have achieved electrification rates of above 90 percent. However, several other provinces, especially those in the eastern part of Indonesia such as Papua and East Nusa Tenggara, only achieved electrification rates of 61.4 percent and 59.8 percent, respectively (Sambodo & Novandra, 2019, 113). For small and remote islands, access to electricity is becoming increasingly limited. Differences in regional income—which is determined by the level of industrialization and urbanization—have become one of the causal factors of unequal access to electricity.

Considering the challenges in meeting its domestic energy demand, there are several things that form the basis for the assumptions of this research. First, Indonesia needs to increase investment in renewable energy development to decrease dependence on fossil energy and expand access to modern energy for people in rural areas. Second, Indonesia also needs to optimize trade in the energy sector to fill the gaps that cannot be met nationally. Third, ASEAN interconnectivity, which is oriented towards energy market integration under the AEMI, may serve as a supporting framework for Indonesia to achieve its energy security from the aspects of availability, affordability, access, and sustainability.

Based on these assumptions, **this study seeks to review the extent of Indonesia's readiness to face ASEAN Energy Market Integration.** The study measures the readiness qualitatively by applying two elements in the energy's integration market, namely (1) the harmonization of regulations at the regional and national levels, and (2) the development of regional energy infrastructure. The study limits the timeframe discussed herein starting from the formulation of APAEC for the 2016-2025 period until the emergence of the AEMI Forum as an extension of the APAEC. This study also focuses on the electricity sector with the following rationalizations: (1). There is a high demand for electricity in Indonesia due to the increasing economic growth and income per capita of the middle class in Indonesia. On the other hand, the annual increase in electricity capacity is progressing slowly (Graph 2). Moreover, the electrification distribution is still concentrated in industrial areas in the western part of Java, while the electrification distribution rate in the eastern part has yet to reach 90%. Thus, Indonesia needs to attract more investment for the construction of power generators; (2). Infrastructure development projects in the electricity sector within the APG framework are relatively more developed than other energy sectors.



Graph 2. Projection of Indonesia's Electricity Capacity (GigaWatt/GW) and Demand (TeraWatt/TW) 2018-2027
Source: PWC, 2018; RUPTL, 2018

2. LITERATURE REVIEW

In mapping Indonesia's readiness for regional integration within the framework of ASEAN energy market, it is necessary to initially examine the conceptual framework of regional integration and how its dynamics interact with the national policies of regional countries. Regional integration can be observed from two dimensions, namely *de jure*, which refers to the institutional dimension of integration (regionalism), and *de facto*, which indicates intense relations between actors in the region (regionalization) (Klecha & Tylec, 2017). Marukawa (2009) confirms the *de facto* dimension of economic integration is determined by trade and Foreign Direct Investment (FDI). Regionalism

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refers to the institutional and instrumental components that underlie the stages of integration and are politically driven. On the other side, regionalization i s more economically driven, which leads to the strengthening of relationships or networks between economic entities or actors through connectivity, which is often economically driven in nature (Klecha & Tylec, 2017).

Regional integration, in this case, needs to be distinguished from regional cooperation. The difference lies in the level of regional consolidation. Regional cooperation describes how various actors in one region work together to achieve a common goal in a particular sector, even though it may have conflictual relations in the other sectors (Söderbaum, 2003). Regional integration involves binding and comprehensive agreements among regional countries to solve problems or to achieve common goals. Due to its more binding nature, a state needs to adopt policies stipulated at the regional level to be internalized in national policies. Klecha & Tylec (2017) add that regional integration often must coincide with state sovereignty.

Shi & Kimura (2014) explain the rationalization for realizing energy market integration, by examining the East Asia region in a case study. Energy market integration (EMI) aims to promote national economic growth, reduce development disparities among regional countries, enhance energy security, and reduce greenhouse gas emissions. However, to achieve energy market integration, Shi & Kimura added that there should be a fundamental shift towards energy security first, from being inward-oriented (nationally) to prioritizing regional cooperation. The energy security paradigm that is more regionally oriented will require member countries to be more open to foreign investment and imported energy products. This condition will expand the opportunities for optimum and efficient use of energy in a region.

Shi & Kimura established the EMI analytical framework from various aspects. After conducting several continuous observations, Shi & Kimura mapped out a conceptual framework that can analyze EMI, those are: (a) trade liberalization, (b) investment liberalization, (c) energy infrastructure and institutional development, (d) domestic energy market liberalization, and (e) energy price reform related to fossil fuel subsidies. These five aspects interrelate with each other. A well-functioning and transparent national energy market is very important in supporting the establishment of a competitive and integrated regional energy market. In this case, each member country of the region has to remove all forms of obstacles, distortions, price and quota restrictions, subsidies, and monopolies that can prevent the optimization of the integration function.

In Southeast Asia, the emergence of AEMI from APAEC can be regarded as morphogenesis of cooperation between the ASEAN countries in the energy sector, which increasingly emphasizes the deepening aspect of regionalism. In their article, Navarro & Sambodo (2013) argue that in realizing energy market integration in the Southeast Asia region, the member countries can rely on the "ASEAN Way" as a practical approach initiated in the Treaty of Amity and Cooperation (TAC). The ASEAN Way can be the first step to building trust among ASEAN countries as it involves the principles of non-interference, openness, informality, consensus, non-violence, and non-confrontation. The ASEAN Way can be used as an approach for implementing the following initial stages of integration (Navarro & Sambodo, 2013):

(a) Transparent evaluation of investment opportunities in energy resource development.
(b) Reliable appraisal of the potential energy trade in the region, which based on mutual benefits.
(c) Comparative survey of the structure of the domestic energy market, regulatory framework, and work plans that focus on the potential for cooperation.

Navarro & Sambodo (2013) add that the ASEAN Center for Energy (ACE) needs to be strengthened to coordinate and monitor the integration efforts. As for the strengthening of regulations, the ASEAN member countries can optimize the role of the ASEAN Regulators' Network (AERN). The next stage is establishing an agreement to remove barriers to energy products trade and barriers to investment in energy infrastructure. Harmonization of rules, standards, and procedures can strengthen trade agreements at the regional level. Then, the next step is to build infrastructure interconnectivity (Navarro & Sambodo, 2013; Fünfgeld, 2019).

In line with Shi and Kimura, Navarro & Sambodo (2013) also draft the EMI analysis framework which is also explained in a simpler way through the following aspects: (a) the existence of a binding agreement, (b) the existence of physical infrastructure, (c) the harmonization of regulations, and (d) coordination between management institutions. This study will use the analytical framework from Navarro & Sambodo to map Indonesia's readiness to participate ASEAN energy market integration.

Various literature also discuss the challenges and obstacles to the creation of ASEAN energy market integration. Fünfgeld (2019) explains that the divergence of interests and policies among ASEAN countries has hampered efforts to harmonize rules. Some differences in the countries' targets and orientations in achieving energy security are the cause of this divergence of interests. Referring to the concept of the “Energy Trilemma”, Fünfgeld explained that countries have different priorities and goals in regional energy cooperation, between prioritizing efforts

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to secure energy supply and creating energy security, improving access to modern energy, or attaining energy sustainability which is more concerned on the environmental aspect. Furthermore, Fünfgeld also explained that the disparity among the ASEAN countries in terms of economic capability, political system, population size, geographical condition, and energy system hinders the realization of energy market integration.

Andrews & Speed (2016) describe the challenges in realizing the integration of the ASEAN regional energy market. In their article, Andrews & Speed stated that although there has been significant progress in the realization of interconnectivity through infrastructure development, project implementation has been relatively slow and could not follow the schedule of the establishment of AIMS II in the ASEAN Interconnection Master Plan (AIMS) II. The reasons for the delay in the implementation of this project have also been documented. The major obstacle is related to the lack of enthusiasm or the inability of the government and national companies to invest in the project. In addition, the interconnection projects are less likely to attract private investors. The second challenge is related to energy governance, which varies from country to country in the region. The existence of gaps and discrepancies in policies, rules, and structures has also become a concern in the 2010-2015 APAEC forum. In response to this problem, HAPUA Working Group 2 with the Asian Development Bank (ADB) provided recommendations for the formation of institutional and contractual agreements to accommodate cross-border trade, taxation, transmission rates, and third-party access (Andrews & Speed, 2016). Li & Chang (2021) categorize challenges in regional integration into (a) lack of agreement and management bodies, (2) different orientations towards energy security, (3) lack of regulations in regional energy cooperation, (4) absence of dispute resolution mechanisms in the energy sector (Li & Chang, 2021).

3. RESEARCH METHODS

This study seeks to map Indonesia's readiness to participate in the ASEAN Energy Market Integration (AEMI) by analyzing integration indicators comprising: (a) harmonization of national policies with regional agreements, and (b) Indonesia's commitment to carrying out physical infrastructure development projects within the framework of cooperation. To analyze the achievement of these indicators, this study uses a qualitative method. Although the qualitative method is often considered lacking in a measurable standard compared to the quantitative method, with a correct data triangulation, the qualitative method can also show a legitimate process. By using inductive approach, the researcher gathers data, interprets it, then triangulates the findings in the analysis and conclusion (Brady, McDavid, et al., 2013, 175). As the research used qualitative method, the answers to the research questions are more into the generalizations of the findings, in the form of explanations about the extent to which Indonesia has implemented policies that are in line with the achievements of AEMI.

The qualitative data used in this study to map the country's readiness in a program or initiative was obtained from two sources, namely in-depth interview with open-ended questions and document analysis. Open-ended questions allow informants to give answers in a more flexible way. This study used semi-structured in-depth interviews, where the researcher prepares a list of questions to be asked. In the interview process, the questions become more elaborative according to the course of the discussion. The resource persons are parties who have insight regarding the development of AEMI, the political dynamics that occur in it, and Indonesia's readiness to face AEMI.

In document analysis, the research team conducted searches for documents related to AEMI and Indonesia's responses, both before and after the interview, as an effort for data triangulation. By triangulating the data, the researcher collected evidence that can strengthen its credibility. Document searches were carried out by reviewing previous studies that examine regional integration related to the energy sector, its potential and constraints, as well as its interaction with national policies of regional countries. Document analysis included skimming (quick checking), exploring the literature and data, and interpretation. This process also combined content analysis and theme analysis. Content analysis refers to the process of organizing information into several categories related to the focus of the study (Bowen, 2009). In this case, the researcher used two energy market integration indicators to map Indonesia's readiness for AEMI. These two indicators were selected due to the recurring pattern appeared in the integration process in other regions. Thematic analysis is a form of recognizing patterns in data, and the themes that emerge become categories for analysis (Fereday & Muir-Cochrane, 2006). This process involves a more thoughtful and attentive retracing and review of the data. After the researchers had obtained two integration indicators to map Indonesia's readiness, the next analysis focused on these indicators. Regarding the indicators of binding agreements and harmonization of regulations, this study examines the agreements formed at the regional level under the AEMI framework and sees how Indonesia adopts these agreements as regulations. Regarding infrastructure development, this research discusses projects that support interconnectivity, such as the ASEAN Power Grid (APG).

In this study, development economists from the Indonesian Institute of Sciences, Dr. Maxensius Tri Sambodo, and an expert from the ASEAN Center for Energy (ACE), Beni Suryadi, were invited to an in-depth interview session. The questions posed to the informants were more about the current progress of AEMI and Indonesia's readiness to deal with it. In more detail, we show the key questions asked in Table 2. Since the interview was semi-

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structured, this list of questions only served as a guide for both the interviewer and the interviewee, but in practice, they can be more elaborative. The informants' answers became the primary data, which was then triangulated with the secondary data to support the research argument.

Table 2. List of Interview Questions

1.	How was the idea to realize ASEAN Energy Market Integration (AEMI) originally formed?
2.	Does one of the goals of the initiation of AEMI also coincide with the achievement of the SDGs targets in 2030, particularly related to energy?
3.	Is AEMI part of a deepening process of the energy cooperation framework at the regional level that has been developed previously, such as APAEC?
4.	What is the role of ACE in realizing the integration of the ASEAN energy market?
5.	Are all ASEAN countries ready for energy market integration? How about Indonesia?
6.	What are the indicators of a country's readiness to take part in the integration of the ASEAN energy market? How is the position of Indonesia in that regard?
7.	What are the challenges and obstacles for ASEAN countries in realizing AEMI? How about Indonesia?
8.	Which countries in Southeast Asia are ready to realize integration/cooperation in the energy sector?

4. DISCUSSION AND ANALYSIS

ASEAN Cooperation Agreement Framework in the Energy Sector

The ASEAN Energy Cooperation Agreement in 1986 was a first milestone to develop a more comprehensive approach to energy cooperation and policy coordination at the regional level. The ASEAN Plan of Action on Energy Cooperation (APAEC) for the 1995-1999 period stipulated the establishment of a coordinating body in the coal, natural gas, electricity, and renewable energy sources, along with the energy efficiency and conservation sectors. APAEC for the 1999-2004 period focused on the development of Trans-ASEAN Gas Pipeline (TAGP) project under the management of the ASEAN Council on Petroleum (ASCOPE). During this period, the Heads of ASEAN Power Utilities/Authorities (HAPUA) conducted a feasibility study on the Master Plan on ASEAN Connectivity (MPAC). This feasibility study then led to the creation of a development plan for the ASEAN Power Grid (APG), which was discussed in the 2004-2009 APAEC forum. APAEC for the 2010-2015 period emphasized the implementation of cooperation to strengthen ASEAN energy security (Fünfgeld, 2019). The action plan in the APAEC for the 2016-2025 period further emphasizes the connectivity agenda as it carries the theme of "Enhancing Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability, and Sustainability for All" (ACE, 2017).

From the abovementioned three phases of APAEC forum evolution, indications to strengthen energy cooperation in Southeast Asia region have been noticed. However, after several decades, there are still several obstacles that must be faced in the implementation of cooperation under the APAEC framework, resulting in the stagnation of certain programs. These obstacles refer to the absence of a comprehensive institutional and regulatory framework, differences in tariff, tax, and pricing policies among ASEAN member countries, differences in regulatory standards related to occupational safety and health and the environment, gaps in financial and technological capabilities, as well as political commitment which are sometimes difficult to predict, resulting in delays in the realization of several cooperation projects (AEMI Group, 2013).

Considering that the APAEC cooperation framework is still experiencing problems and tends to be not so progressive, several technocrats and research groups held a forum to initiate AEMI. To achieve its optimal goals, AEMI Group introduces policies and creates a framework at the ASEAN Economic Community level by changing the coordination mechanism that was previously more *ad hoc* and bilateral in nature to become multilateral and more integrated.

AEMI is expected to integrate energy market more than APAEC. Therefore, it is important to take a more detailed look at the regulatory agreements in AEMI since the conception of the idea. During 2013-2014, the formation of the AEMI Group, which included academics and researchers from all ASEAN member countries, was initiated in

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Bangkok to collaborate in scheming the blueprint and roadmap of AEMI under the pillars of the ASEAN Economic Community (AEC). This roadmap was then published in working group papers.

The discussion became narrower when the group tried to follow up the recommendations made in APAEC 2016-2025, as the institutional framework that oversees the development of ASEAN connectivity infrastructure. In the transmission sector, the AEMI Working Group held discussions between relevant entities, such as the ASEAN Center for Energy (ACE) and Heads of ASEAN Power Utilities and Authorities (HAPUA). To encourages electricity trade between ASEAN countries. In 2016, the AEMI Group reached an agreement with related parties on the creation of the ASEAN Electricity Exchange (AEE). AEE is expected to be a frontrunner in the electricity trade, aimed to balance services with more cost-effectiveness trade between countries. AEE is also expected to be the operational basis of the APG based on multilateral agreements in 2018. In implementing AEE, ASEAN countries tend to apply the principle of "ASEAN Way" which comprises a more voluntary approach and based on a shared cost-benefit mechanism. In practical mode, the ASEAN countries need to develop a transparent, efficient, and predictable regional pricing model for trade. Moreover, member countries are required to guarantee an equitable distribution of new and renewable energy sources (in asean.aemi.org, 2017):

Accordingly, AEMI cooperation focuses on policy adjustments made by ASEAN member countries which include: (1) energy trading system and investment liberalization; (2) domestic energy market structure reform; (3) Energy standards and regulations harmonization; and (4) energy sector planning and development coordination (Navarro, Sambodo, & Todoc, 2013). However, based on the agreement between AEMI Group and HAPUA at their meeting in 2017, restructuring the domestic situation in achieving energy security is not possible in the near future. This was also confirmed in an interview with Beni Suryadi from the ASEAN Center for Energy (ACE), who said that AEMI is still in the recommended discourse stage and has not been discussed formally and in an in-depth manner in the ASEAN forum. However, the potential for integrating the ASEAN energy market exists. The increasingly narrow and in-depth discussions in the APAEC forum and the realization of several multilateral connected infrastructure development cooperation projects are testaments of such potential, although technical and political factors still remain as obstacles. [2]. In the next section, this research discusses the convergence of Indonesia's national policies with the planned formation of AEMI based on two aspects, namely the alignment of standards and regulations, especially in the electricity sector, and Indonesia's commitment to APG infrastructure development projects that support ASEAN interconnectivity.

Policy Harmonization

The logic of regional energy market integration often associates with the procurement of electricity sources to help achieving national and regional electrification targets. AEMI becomes a forum for the implementation of AEE, which includes trade in electricity across national borders. To achieve the goal of integration optimally, it is necessary to harmonize national policies with regional agreements. **The first harmonization scheme** in standards and regulations for regional market integration relates to intra-regional electricity trade. This harmonization is important to balance the role of state in order to organize an open, competitive, and transparent energy market (Shi & Malik, 2013, p. 53).

Foreign businesses have long complained about uncertainty and inconsistency of regulation in Indonesia. The government attempted to address this issue by implementing the Omnibus Law on Job Creation, which aims to streamline the regulation of business. However, the potential benefit of such regulation was offset by protectionist measures that restrict the flow of goods and investment in Indonesia. While Indonesia aims to align its national regulations with regional electricity trade liberalization demands, tension persists between market-driven reforms and the government's view of electricity as a strategic public good. The National Electricity Law No. 30/2009 allows for differentiated tariffs based on Business Area, adjusted according to customer purchasing power and power distribution levels. This flexible tariff structure aims to incentivize investment, particularly in electricity transmission infrastructure. Presidential Regulation No. 5 of 2006 on National Energy Policy further signals a move toward market-based energy pricing. However, this regulation also emphasizes the need to consider the affordability for small businesses and to provide assistance to low-income consumers (KESDM, 2006). This dual approach reflects the Indonesian government's ongoing balancing act: promoting market liberalization to attract investment while maintaining state oversight to ensure equitable access to electricity.

Indonesia's policy on electricity regulation and pricing is a delicate harmony between market liberalization and social welfare. National Electricity Law No. 30/2009 established a liberal tariff regime capable of addressing variations in electricity price across regions. The regime factors in customer buying power and distribution of power between different consumer classes, with prices being more for bigger power installations (setkab, 2022). The adjustable tariff mechanism has created room for greater investment, particularly in transmission infrastructure projects. This is consistent with Indonesia's ambitious plans to develop its renewable energy capacity, as outlined in

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the revised National Power Supply Plan (RUPTL). The plan aims to add 71 GW of installed capacity over the next decade, with 70% coming from renewable sources, primarily solar (17 GW), hydropower (16 GW), and geothermal (5 GW) (Bo-yu, 2025).

Despite moving in the direction of marketization, the Indonesian government still maintains firm control over the energy sector. The recent exercise of maintaining electricity prices for industry and businesses when others have already been changed reflects this (Antara, 2022; Setkab, 2022). It aims to promote post-pandemic economic development while keeping a lid on inflation. Its differential policy in the hike in tariffs again reflects the government's intent to balance market forces with welfare. For instance, while increasing tariffs for non-subsidized households using 3,500 VA or higher and government institutions, it has maintained tariffs for households using below 3,500 VA and for enterprises and industries (setkab, 2022).

Recent trends also show Indonesia's efforts to join regional and global energy trends. Indonesia is now seeking to increase the share of renewable energy in the overall energy mix to 35% by 2034 from 23% at present. Such lofty goal is a reflection of Indonesia's aspiration to reduce carbon emissions and move towards cleaner energy sources, though not at the expense of denying the need for some fossil fuel capability to supply base-load power, particularly in densely populated areas like Java (Bo-yu, 2025). Briefly, Indonesia's electricity price and regulation policy is a balanced approach that seeks to balance national interests with regional pressures for trade liberalization while maintaining the energy sector as a strategic public good in state hands.

The ASEAN Power Grid (APG) has emerged as a flagship project under the ASEAN Economic Community (AEC) plan, which fosters intra-regional electricity trade and energy security. Indonesia has been an active contributor to this project, establishing partnerships with Singapore and Malaysia to drive cross-border electricity trading in Southeast Asia. As of 2025, Indonesia's involvement in the APG has progressed significantly. The country signed a Memorandum of Understanding (MOU) with Singapore in September 2023 to develop low-carbon energy projects and cross-border electricity trade (MTI Singapore, 2023). The agreement is under Singapore's ambitious plan to import up to 4 gigawatts of low-carbon electricity by 2035, with Indonesia expected to play a crucial role as a major energy producer in the region. The APG project has seen significant progress, with plans to increase interconnection capacity from 7.7 GW to 17.6 GW by 2040. Indonesia's role in this initiative has grown, with the country now exporting 4.1 TWh/year of electricity to both Malaysia and Singapore as of 2025 (IESR, 2024).

There are two national regulations that become legal basis for Indonesia's involvement in APG cooperation projects. First, the Government Regulation (PP) No. 42 of 2012 concerning the Sale and Purchase of Transnational Electricity. Second, Energy and Mineral Resources Ministerial Regulation No. 26 of 2012 concerning Procedures for the Application for Sales, Purchase, and Interconnection Permits for Cross-border Electricity Networks. These two regulations reveal the commitment of Indonesian Government to fulfill the electricity demand in the outermost regions.

Beside facilitating the distribution of electricity, the issuance of the regulations also supports the Independent Power Plant Companies (IPPs) to take part in regional trade. Moreover, the issuance of Electricity Supply Business Permit (IUPTL) also allows further collaboration between the government and the private sector in providing electrical energy for people in remote areas that have not received adequate supply (Tisnadisastra, 2013). This collaboration has been considered prolific as more than 50 holders of electricity supply business areas exist, with more than 40 businesses are operating and the rest are still being developed (Directorate General of Electricity, 2020).

The second harmonization plan that aligns with the AEMI procedures within the electrical sector is the one relating to the subsidies on prices. The harmonization of electricity pricing and subsidy policies across ASEAN nations remains one of the most important challenges in the realization of an integrated regional energy market. As of 2025, this issue is still a priority under the ASEAN Economic Community (AEC) Blueprint and the ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 implementation. Diversified electricity pricing due to the variations in subsidy policies among ASEAN member countries is a challenge to the establishment of an integrated energy market at the regional level (AEMI, 2015). Energy subsidy is costly to state budgets as it dissuades investment interest at the macroeconomic level. It has a tendency to aggravate economic inequality and impinge on the advancement of clean energy projects. Therefore, to be consistent with APAEC 2016-2025 goals, ASEAN member states are required to remove energy price subsidies without causing injury to the poor (AEMI, 2015).

Indonesia, a key player in the region, exemplifies the ongoing struggle to balance subsidy reduction with social welfare concerns. According to recent estimates by PLN, Indonesia's state-owned electricity utility, the government is expected to spend approximately Rp 83 trillion (US$5.11 billion) on electricity subsidies in 2025 (Karyza, 2024). This marks a 9.56% increase from the previous year, highlighting the persistent challenge of subsidy reduction.

The continued reliance on subsidies across ASEAN countries has several consequences:

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- Budget strain: Subsidies strain the budgets of governments, which might deprive other sectors of significant funding.
- Discouragement of investment: Higher levels of subsidy discourage private sector investment in the energy sector, particularly in renewable energy programs.
- Distortion in the market: Subsidized prices might support wasteful energy consumption patterns and deter the emergence of a regional competitive energy market.
- Environmental impact: Subsidies artificially lower the cost of electricity generated from fossil fuels and can prevent the transition to cleaner energy sources.

However, ASEAN member states have made progress in aligning their policies with APAEC 2016-2025 targets. The region aims to increase the component of renewable energy to 23% in the ASEAN energy mix by 2025 (ACE, 2023). The Indonesian government itself has not been able to eliminate electricity tariff subsidies thoroughly, despite a downward trend of subsidies since 2012 (Table 3). The latest subsidy regulation was announced through Regulation of the Minister of Finance No. 44/2017 (as amended by Regulation of the Minister of Finance No. 162/2017) concerning Procedures for Provision, Calculation, Payment, and Accountability of Electricity Subsidies. Based on this regulation, electricity subsidies only apply to customers whose electricity tariffs are below the average cost of electricity supply (PWC, 2018).

Table 3. Average Cost, Average Tariff, Electricity Subsidy

Year	Average Cost (IDR/kWh)	Average Tariff (IDR/kWh)	Subsidy (IDR Trillion)
2012	1,374	728	103.3
2013	1,399	818	101.2
2014	1,420	940	99.3
2015	1,300	1,035	56.6
2016	1,265	991	60.4
2017	1,318	1,105	45.7

Source: PWC, 2018; PLN Statistics, 2017.

In January 2017, the Government revoked electricity subsidies for customers using 900 Volt Ampere (VA) of electricity who fall into the category of high-income households. Previously, the government had also abolished subsidies for households that subscribe to electricity service with a capacity of 1,300-6,600 VA, business customers with a capacity of over 200 kilo Volt Ampere (kVA), government office customers with a capacity of 6,600 VA to more than 200 kVA, as well as the industrial and road lighting sectors or special services with a capacity of over 200 kVA. The government only grants electricity subsidies to household customers with an electricity capacity of 450 VA and 900 VA (PWC, 2018).

The third power sector harmonization plan in Indonesia is focused on the transmission and distribution network, which the state-owned utility Perusahaan Listrik Negara (PLN) leads. PLN continues to have a constitutionally entrenched monopoly in the transmission and distribution of electricity to ensure the supply of power at regulated prices to the masses. Private sector involvement has been increasing under some schemes, however, to support the country's growing energy requirements. Private entities, particularly Independent Power Producers (IPPs), have assisted in building transmission facilities, particularly for power plants located in remote areas. These projects typically operate on "Build-Lease-Transfer" (BLT) or "Build-Operate-Transfer" (BOT) models under which PLN resumes the ownership of the infrastructure after the term of the contract. Additionally, private sector participation is also extended to Engineering, Procurement, and Construction (EPC) contracts and Public-Private Partnerships (PPPs) offered by PLN to ensure the development of infrastructure.

In 2020, private electricity purchases increased by 13.8% compared to 2019 due to the inclusion of private power plants under the IPP scheme that have started their operations (PLN, 2020, p. 60). Increasing opportunities for private parties' involvement in electricity supply provision are a result of the Government of Indonesia's action for the attainment of the target of the National Strategic Program of 35000 MW to drive national economic growth, as stipulated in Presidential Regulation Number 4 of 2016 on the Acceleration of Electricity Infrastructure Development, and the RUPTL (Electricity Supply Business Plan) 2015-2024 as per the Minister of Energy and Mineral Resources Decree Number 0274/K21/MEM/2015 dated 12 January 2015 (PLN, 2020, p. 181).

The explanation of the transmission and distribution mechanism of the electricity network above shows that the Government of Indonesia's wish to harmonize policy with regional regulations. The national regulations that have been applied give some flexibility so that it opens wider opportunities for the private sector to invest in transmission

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and distribution development. However, PT PLN (Persero)'s monopoly over electricity network supply, construction, and distribution can be a hindrance in integrating regional energy markets.

The fourth harmonization plan is focused on Renewable Energy development policies, specifically within the power sector. June 2015 dialogue forum between AEMI Group and HAPUA agreed on two dimensions of NRE development, i.e.: (1) Compliances regarding the development of NRE and (2) Small-scale power network development to support citizens living in outermost regions. APAEC 2016-2025 forum outlines at least five main strategies (ACE, 2015). First, ASEAN countries need to propagate the idea of transitioning energy consumption to 23% utilization of NRE in total supply by 2025. Second, ASEAN countries need to propagate discussion of NRE development among stakeholders at regional and international levels. Third, research and development on NRE technology must involve research institutions or universities. Fourth, the financing instrument for NRE growth must be strengthened at the national, regional, and international levels. Fifth, ASEAN countries must endorse commercial use of biofuels.

In response to the five strategic agreements at the ASEAN level, the Indonesian Government through Presidential Regulation no. 22 of 2017 on the General National Energy Plan (RUEN) has continually discussed the use of NRE. This is supplemented by the Minister of Energy and Mineral Resources Regulation No. 39 of 2017 regarding the Implementation of Physical Activities utilizing New Energy and Renewable Energy as well as Energy Conservation. Nevertheless, the Government of Indonesia, had been concerned about the development of NRE before AEMI and HAPUA placed it on the agenda. Through Presidential Regulation No. 5 of 2005 on the National Energy Policy, the Government has reiterated the target for the national energy mix in 2025 with the use of 17% NRE. This regulation also maintains the Green Energy Policy by Ministerial Regulation No. 2 of 2004. Various regulations related to NRE can also be accessed separately, such as Law no. 30 of 2007 on energy; UU no. 30 of 2009 on electricity, and Law no. 21 of 2014 on Geothermal Energy.

The Minister of Energy and Mineral Resources Regulation No. 16 of 2020 on the Strategic Plan of MEMR for 2020-2024 determines the development of NRE in the electricity sector. The Regulation commands small-scale power plants of NRE type, i.e., Micro-Hydro Power Plants (PLTMH), Small-Scale Coal-Fired Steam Power Plants (PLTUB-SK), and Small-Scale Geothermal Power Plants (PLTP). Several of them have also been operated on other locations in Indonesia, following the available NRE potential. For example, the Small-Scale PLTP in Kamojang in the West Java Province, which has been built on the Agency for the Assessment and Application of Technology (BPPT) concept, a Non-Ministerial State Institution within the coordination of the National Research and Innovation Agency (BRIN) (BPPT, 2021). PT PLN, the leading business player in the electricity sector in the country, has achieved the target of 61.1% in 2020 in addition to the capacity of NRE-based power plants (PLN, 2020).

In practice, PLN often faces several challenges in the technical, economic, and environmental aspects. One of the technical obstacles faced by PLN is the intermittent penetration of electrical energy from renewable energy plants. The economic challenge is related to the relatively uneconomical tariff for electricity generated from NRE plants. The environmental challenge refers to issues related to land acquisition and the location of land that coincides with environmental conservation areas/nature reserves, which often causes conflicts with local communities (PLN, 2020). However, the Government of Indonesia has also shown an effort to fulfill the target of 23% NRE mix by 2024 through various regulations that support the use of NRE in the electricity sector.

Infrastructure Development: Indonesia's Commitment to the ASEAN Power Grid Project

The ASEAN Power Grid (APG) has made significant progress since its inception within the ASEAN Vision 2020 framework. As of February 2025, the APG has evolved into a cornerstone initiative for regional energy integration and sustainability. Currently, the APG has an installed regional electricity capacity of 7.7 GW, with nine out of the planned 18 key interconnection projects completed (reglobal.org, 2024). These interconnections primarily operate on a bilateral basis, utilizing long-term power purchase agreements (PPAs) for energy trade. The APG aims to expand its capacity to 17.6 GW by 2040, comprising 18 interconnections (9 new and 9 existing) (Lee, 2024). At the 2004-2009 APAEC forum, the idea of developing the APG project was discussed in an in-depth manner. Since the idea of establishing AEMI is conceived to fill the gap of APAEC, the countries' commitment to realizing infrastructure development projects under the APAEC scheme becomes one indicator to determine the extent of the country's readiness to face AEMI.

Indonesia has considered APG development and actively supported the idea in every APAEC forum. At APAEC 1999-2004 (Table 4), Indonesia has so far planned to build an electricity network connecting Sumatra to Peninsular Malaysia (Priority 4) and Sarawak to West Kalimantan (Priority 6). Indonesia also agreed to build trilateral electricity network connecting Batam, Bintan, Singapore, and Johor (Priority 5). It shows that Indonesia has also arranged the development of electrical interconnection projects multilaterally with Singapore, Malaysia, and even Thailand. This agreement serves as Strategy I in the construction of electrical interconnection. In Strategy II, it is

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planned that electricity transmission cooperation within the framework of the Greater Mekong System (GMS) will be expanded to cover all ASEAN countries. Strategy III utilizes sub-regional growth areas, namely Singapore-Johor-Riau (RIAU), Indonesia-Malaysia-Thailand (IMT), and East ASEAN Growth Area (EAGA) (Aris & Jorgensen, 2020).

Table 4. Fourteen APG Project Plans

P1	Peninsular Malaysia–Singapore	P8	Sarawak–Sabah–Brunei
P2	Thailand–Peninsular Malaysia	P9	Thailand–Lao PDR
P3	Sarawak– Peninsular Malaysia	P10	Lao PDR–Viet Nam
P4	Sumatra– Peninsular Malaysia	P11	Thailand–Myanmar
P5	Batam–Bintan–Spore–Johor	P12	Viet Nam–Cambodia
P6	Sarawak–West Kalimantan	P13	Lao PDR–Cambodia
P7	Philippines–Sabah	P14	Thailand–Cambodia

Source: Aris & Jorgensen, 2020.

In the APAEC Forum 2004-2009, of the 14 projects that have been previously identified, only 2 projects (namely Priority 1 and Priority 2) have been realized. Projects involving Indonesia are planned for completion in 2009 (Priority 4, Priority 6), and after 2009 (Priority 5). In this forum, a study of the policy, regulatory, legal, financial, and commercial frameworks was also conducted to overcome obstacles in realizing interconnection. Based on the results of interviews with ACE, this development project is progressing slowly even though P4 and P6 are targeted for completion in 2009. According to the resource persons, the delay in the realization of this development plan is caused by tangible and intangible factors. The tangible factors are related to the different geographical conditions among the ASEAN countries that entered into the agreement. Differences in institutional and regulatory frameworks also become a challenge. The intangible factor is more related to the perception of the need for APG cooperation and the underlying geopolitical considerations. This will also determine the extent of the state's willingness to realize regional infrastructure development cooperation projects[3].

In the 2010-2015 APAEC forum, Indonesia's commitment is increasing visible with new agreements connecting East Sabah and East Kalimantan (Priority 15) and a project connecting Singapore and Sumatra (Priority 16). The 3rd APAEC Forum also discussed the acceleration of development realization. One of the actions defined to accelerate these projects is optimizing the role of the APG Consultative Committee (APGCC), as a consultative team in mitigating barriers to interconnection agenda. The development of connected electrical energy infrastructure between ASEAN countries also correlates with trade. PT PLN entered into a trade agreement with Sarawak Energy Berhad (SEB). SEB sells electrical power of 230 Megawatts to PLN using a new transmission line with a voltage of 275 kV. The project connects Mambong in Sarawak as well as Malaysia and Bengkayang in West Kalimantan (Aris & Jørgensen, 2020).

In the 10-year APAEC forum (2016-2025), infrastructure development projects involving Indonesia (Priority 4) are included in the priority to be realized in 2020. Indonesia is also included in the cluster of electricity trade agreements in the Southern region with Malaysia and Singapore, as well as in the Eastern region with Brunei Darussalam, Malaysia, and the Philippines. Since the beginning of the APAEC negotiations, the issue of regulatory alignment has always been a subject of discussion, both on a bilateral and regional scale. The issue of regulatory alignment is related to tariffs, taxes, and the involvement of third parties, both in the institutional and contractual schemes (Aris & Jørgensen, 2020). The 4th series of APAEC also discussed the expansion of partnerships with the private sector. PLN also signed a Memorandum of Understanding (MoU) with Tenaga Nasional Berhad (TNB) Malaysia on September 25, 2019. In the MoU, an export of 600 MW of electricity from Sumatra to Malaysia was agreed upon (P4).

From the evolution of the APAEC negotiations related to the APG project, the agreements tend to be bilateral or trilateral in characteristics. The agreements are not yet made in a comprehensive regional scheme. If we rely on the logic of building blocks in regionalism, this sub-regional cooperation is the first step to building a comprehensive integration. However, a long process is required to do so. Sambodo, Navarro, and Binh (2013) stated that progress of the implementation of the APG project tends to be long-drawn-out. The discussion of the implementation of P4, P5, and P6 programs was only started on the 3rd APAEC. Although the arguments are still debatable, some assume that budget constraints, technical limitation, and policy framework differences cause the delay in cooperation. Moreover, most of the ASEAN countries still implement monopolistic and protective policies over energy issues, by emphasizing

the role of their national energy companies. This behavior reduces the interest of stakeholders to invest in the project development.

5. CONCLUSION

From the analysis related to the harmonization of regulations and commitments to realizing infrastructure development that can support regional interconnectivity within the framework of AEMI, it can be concluded that Indonesia has made several adjustments. Regarding the harmonization of regulations, although it is not explicitly stated that Indonesia has made several efforts to harmonize the regulations with the regional agreements, several policy adjustments made by Indonesia in the energy sector, specifically electricity, show that there is a coherence between the regulations and the regional agreements. The first harmonization scheme is related to the adjustment of Indonesia's national regulations in response to demands for regional electricity trade liberalization. This harmonization aims to support the balance of the role of the state in organizing an open, competitive, and transparent energy market in the region. Even though PLN is still a major actor in the electricity sector, the issuance of more flexible regulations also opens up opportunities for the creation of a collaboration mechanism between the government and the private sector. The second harmonization scheme is related to the restriction on the electricity price subsidy scheme. Based on a study conducted by the AEMI Group, the different pricing of electricity among the countries due to differences in subsidy levels can also hinder the realization of AEMI. Although Indonesia has not been able to thoroughly cancel electricity subsidies, Indonesia has enacted a policy of reducing electricity subsidies and limiting them to customers whose electricity tariffs are below the average cost of electricity supply since 2012. The third harmonization scheme refers to the transmission and distribution policy of the electricity network, which tends to involve the private sector more than any other sector. Although PLN still has a centralized role, through the “Build-Lease-Transfer” scheme, the Engineering, Procurement, and Construction (EPC) projects offered by PLN, as well as Public-Private Cooperation (KPS), there has been an increase in the contribution of the private sector in the provision of the national electricity supply. The fourth alignment refers to the NRE development policy. The 2020-2024 MEMR Strategic Plan involves the plan for the development of small-scale NRE-based power plants, such as Micro-Hydro Power Plants, Small-Scale Coal-Fired Steam Power Plants, and Small-Scale Geothermal Power Plants. Some of these small-scale power plants have also been operated in various regions in Indonesia based on the potential of NRE in the regions.

Regarding Indonesia’s commitment to develop regional electrical energy infrastructure as part of ASEAN interconnectivity, Indonesia has established cooperation with several countries, such as Malaysia, Singapore, and Thailand, through the APG framework. However, the cooperation projects emphasize more on bilateral efforts and have been slow in meeting the specified deadlines. The delay in the development of regional power networks is due to the complexity of measurable aspects, such as pricing, profit sharing, technical barriers related to distribution mechanisms, as well as regulatory differences and the involvement of the private sector; and aspects that are more intrinsic and difficult to measure, such as the level of willingness, perception of the need for electrical energy itself, as well as political factors and state sovereignty.

The idea of establishing market integration certainly requires a greater delegation of authority, meaning that it often becomes more sensitive to issues concerning sovereignty. Thus, the challenge to realize AEMI is quite enormous and time-consuming, involves complex policy processes and adjustments, as well as requires convergent country commitments. Before it can be considered ready to face the discourse of ASEAN energy market integration, Indonesia needs to first map its energy interests, both in institutional and geopolitical contexts. In addition, there is a need to re-assess the existing regional coordination among ASEAN countries in the energy sector. A more inclusive coordination that involve private actors seems imperative to increase competitiveness and attractiveness in energy infrastructure development.

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