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MORALITY BEFORE KNOWLEDGE

The role of political influence in shaping national energy policy and environmental sustainability

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ABSTRACT

Background: Indonesia's efforts to transition to low-carbon energy are one part of rescaling environmental governance through a process of decentralization, and many actors at the governance level are involved in the transition to low-carbon energy. This research discusses the direction of energy supply policy in Indonesia in the future and its relationship with interested parties, especially the central government. **Methods**: This study uses literature study and document analysis with stakeholder mapping and PESTEL analysis to examine the energy transition policy in Indonesia, especially the electricity sector. The main focus is on the political aspect by considering economic, social, technological, environmental, and legal factors. **Findings:** The results show that regulatory and institutional areas have been restricted during the energy plan-making process, all centralized under central government control making it impossible for local action to take place. However, how sub-national actors can harness this space is influenced by many variables, such as political-economic structures, public participation, and power relations. **Conclusion**: It can increase understanding of the energy transition at every level and offer useful policy advice to engage all interested parties at national and local levels. The openness of the energy transition should be reformed and reduced from the non-substantial political influence for the matter of all Indonesian people. **Novelty/Originality of this article:** This study provides a unique perspective on Indonesia's energy transition by critically examining the role of governance decentralization in shaping policy directions. Unlike previous studies that focus solely on technological or economic aspects, this research integrates political, social, and environmental dimensions through stakeholder mapping and PESTEL analysis.

KEYWORDS: energy policy; energy transition; Indonesia; low-carbon; national energy.

1. Introduction

Industrialization is an inseparable part of world development to support human survival. For this reason, natural resource management is needed to produce energy to carry out industrial activities. The energy sector is a huge contributor to the industrial and economic sectors. Globally, energy production is still dominated by fossil fuels. Fossil fuel energy sources are limited and unrenewable; moreover, combusted fossil fuel can emit exhaust gas and pollute thereby damaging the environment (Hanif et al., 2019; Ali et al., 2018), and ultimately contributing to climate change and global warming. Charfeddine & Kahia (2019) opined that in recent times, the major consumption of renewable energy (EBT) is responsible for the changes in the climate. The increasing decline in environmental quality is a challenge that must be faced in improving the quality of life throughout the world. As a result of these challenges, the need for safe and clean energy becomes a necessity. Researchers and policymakers have realized the benefits of switching from non-

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renewable energy consumption to renewable energy consumption. Renewable energy resources are able to repair themselves in a shorter period of time than non-renewable energy. Examples of renewable energy are wind, water, solar, and geothermal energy (Nathaniel et al., 2020). Energy is needed in almost all sectors of life, such as industry, transportation, household activities, and others. This is in line with the increase in natural energy consumption every year. In Indonesia, two activities hold the majority percentage of energy usage; the industry sector with about 45% and transportation with about 37%. Meanwhile, household activities and commercial only took about 17% compared to the overall outlook in 2022 (Dewan Energi Nasional, 2023). Total world energy consumption based on IEO in 2020 touched 629 quadrillion Btu and will continue to increase until 2040 will be estimated to reach 815 quadrillion Btu. Aslan et al. (2013) said that energy is a basic need in human life today and will increase its needs along with economic growth. Energy demand is increasing in many countries around the world, along with richer societies and more populations. Increasing energy consumption makes the challenge of transitioning our energy system from fossil fuels to low-carbon energy sources more difficult (Lee et al., 2020). These natural resources are obtained by exploration and exploitation, which then produces energy to be reused to obtain natural resources then becomes an inseparable cycle. For this reason, energy has an important role in the acceleration of the economy in the world. Currently, the world is facing a climate change crisis, so a rapid shift towards development with a low-carbon concept is needed (IPCC, 2021).

At the Asian regional level, coal-fired power generation activities are one of the activities that have the highest carbon emissions in the world. Based on research conducted previously in 2020 and updated in 2022, the use of natural resources as raw materials for energy generation in the world can be seen in Figure 1 below.

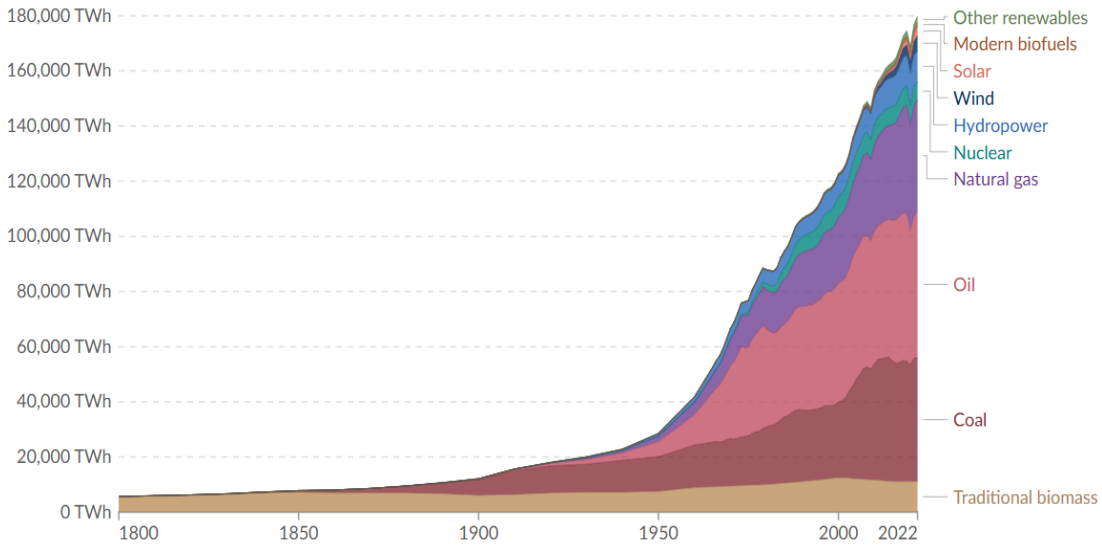

Fig. 1. Energy production in the world 1800 – 2022 by source (Ritchie et al., 2020)

Based on the graph above, it can be concluded that the use of fossil fuels as an energy source still dominates in the world, including petroleum, coal, and natural gas. Similar to general conditions in the world, based on the 2022 Energy and Mineral Resources (ESDM) sector performance achievement report by the Ministry of Energy and Mineral Resources coal-fired electricity generation still occupies the top position of 67.21%, even tends to increase by 8.8% when compared to the 2017-2022 period. The use of new renewable energy (EBT) sources has been increasing as well from 13.65% in 2021 become 14.11% in 2022; however, it is not as significant as the use of non-EBT sources, but it can considered a good start toward the transition energy.

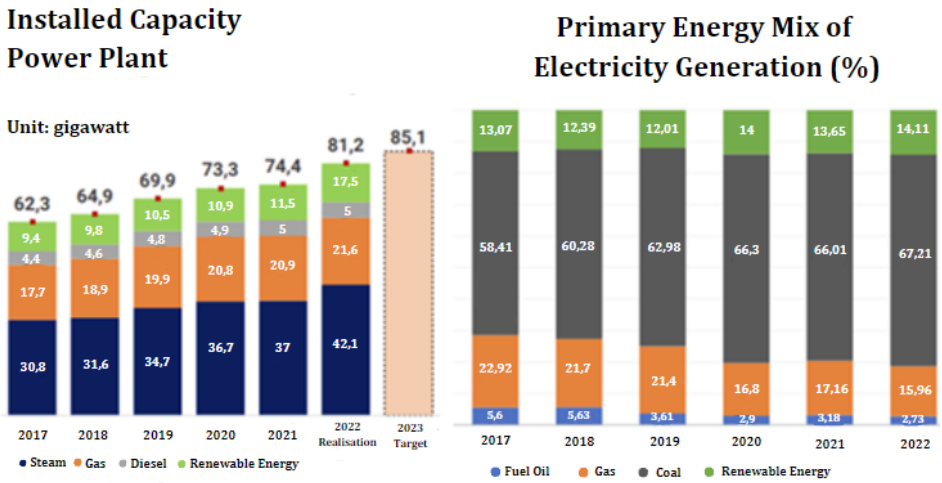

Fig. 2. Status of electricity generation in Indonesia in 2022
(ESDM Sector Performance Achievement Report 2022 & Target Year 2023)

There fact that the use of fossil fuels is still dominating because it is considered a cheaper energy source compared to the EBT and does not require complex technology that tends to require expensive investment costs.

Table 1. The economic value of power plants based on their technology

Technology	Cost of investment (USD per W)		Operation and maintenance Cost (% of investment cost)	Operating time (Year)
	2020	2070		
Coal	1.12	1.12	2.5	40
Natural gas	0.64	0.64	3.6	30
Nuclear	1.79	3.73	3.7	50
Hydropower	1.61	1.61	3.5	50
Solar PV	0.61	0.55	0.88	25
Wind offshore	2.24	1.85	3	25

(Bhattacharya et al., 2023)

However, the cost of renewable energy is rapidly declining globally. The investment value can be seen in Table 1, where the average investment value, operation and maintenance costs, and operating life of fossil fuel power plants combined are still lower than EBT sources but might depend on the type of technology chosen.

However, reforms in the low-carbon energy transition are important to address the problem of climate change. The development of energy production in the world is directed to the concept of sustainability by using renewable natural resources such as hydropower, wind, and even nuclear energy; although the dominance of the use of non-renewable natural resources remains as the first choice. Recent studies today emphasize local and regional transitions and the role of the energy transition policies in a wide range are influenced by politics (Bulkeley & Castân-Broto, 2013; Wretling et al., 2018; Kuzemko, 2019; Hoppe & Miedema, 2020). As the energy transition progresses, it is undeniable that politics, power, and interactions between actors at different scales have their own roles (Meadowcroft, 2009; Bridge & Gailing, 2020). Researches show that government involvement is indispensable in pursuing the global energy transition; it is not only at the level of the central government as the regulator, but the local government may be involved as well (de Boer & Zuidema, 2014; Wretling et al., 2021).

In addition, the level of acceptance and success of the energy transition depends on the participation of the community and interested parties (Magnani & Osti, 2016; Hargreaves et al., 2013). Nevertheless, several studies were conducted to understand how stakeholders of all sizes work together in planning for the energy transition. In this research, the authors

seek to see and investigate how interested parties at the national and local levels work together in planning the energy transition in Indonesia, which is currently considered one of the largest economies in Southeast Asia. The research will examine how these parties negotiate the future of energy as the energy planning process unfolds on the ground and how these negotiations shape the transition trajectory. In addition, this article identifies the components that contribute to the process and outcome of the energy planning process and explores how regulatory frameworks and institutional arrangements for energy transition planning, as well as the impact of each decision-making, relate to the subject of discussion. Based on the agreement on climate change implemented in Paris in 2015, binds 196 countries to reduce greenhouse gas (GHG) emissions on their respective national scales. Indonesia as one of these countries has set an ambitious commitment to reduce GHG emissions with its own capabilities by 2030 to 31.89% and wants to increase it to 43.20% with international support (Ministry of Energy and Mineral Resources, 2023).

The GHG reduction is mainly focused on the energy generation sector by applying EBT, carrying out energy efficiency, converting coal fuel to low-carbon fuels (such as natural gas), and applying other clean electricity generation technologies. This target has changed slightly when compared to the commitment contained in Presidential Regulation No. 98 of 2021 concerning the Implementation of Carbon Economic Value for the Achievement of Nationally Determined Contribution Targets and Control of Greenhouse Gas Emissions in National Development, where previously the government set an achievement target of 29% for GHG emission reduction with its own efforts and by 41% with the help of international cooperation. As one of the national GHG emitters from the power generation sector, The National Electricity Company (Perusahaan Listrik Negara, abbreviated as PLN) is also committed to making national electricity generation activities carbon neutral to achieve the 2060 target, by starting the conversion of conventional power plants in 2030 (Hamdi & Adhiguna, 2021). Amid a deep process of decentralization and shifting authority at different levels of government, Indonesia's efforts to transition to low-carbon energy are a challenge.

Thus, this research aims to look at the correlation of politics and identify the overall stakeholders that might be impacting the energy transition policies in Indonesia. By understanding the political atmosphere, the researcher will know the actors behind each decision and its influences, not only for the final product but also from the beginning process. The politics in energy planning is critical because as is an important process through which public policy directs the energy transition which is supposed to be aligned with the commitment towards GHG emission reduction and the climate change act. Informed by geographic change and attention to improving energy governance, we argue that considering the multi-level interactions of actors across multiple scales of governance and the dynamics of power relations can yield a clearer understanding of changes in energy policy. In addition, our analysis aims to challenge the understanding of energy planning itself through technology and political approaches.

2. Methods

This research uses qualitative methods to be able to describe the relationship between interested parties or actors and interactions among them in energy studies (Sovacool et al., 2018). In this research, researchers use literature study methods and analysis of documents, including reviewing applicable policies and regulations that focus on the energy-related topic. The literature study was conducted by collecting documents such as previous studies, media reports, reports, and policies and regulations applicable in Indonesia regarding energy planning in relation to GHG emission reduction and climate actions as minor discussion. The main documents of previous research and reports are accessed via the Internet according to the theme to be discussed. The secondary data set is then analyzed using qualitative methods. According to Sugiyono (2017) qualitative research is a research method used to examine the conditions of natural objects, and the researcher himself as the key instrument, data collection techniques used with triangulation, the data obtained tend to be qualitative data, the data analysis is inductive or qualitative, and the

results. Qualitative research is to understand meaning, understand uniqueness, construct phenomena, and find hypotheses. Related to Indonesia's commitment globally and nationally to switch to low-carbon energy to reduce GHG emissions, it is necessary to make efforts to plan a better national energy policy (KEN) path to achieve a clean energy future.

This qualitative research will adopt stakeholder mapping analysis in conjunction with PESTEL (Political, Economic, Social, Technology, Environment, and Legal) analysis. The combination of the methods is expected to be able to define and categorize the relationship of each actor in energy transition policies and regulations. Even though this research is focused on the political aspect; the other aspects would be considered in the analysis as a comprehensive process that influences the political as well. The concept of PESTEL analysis can be seen in Figure 3 below.

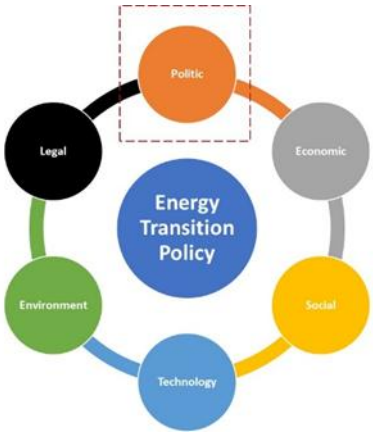

Fig. 3. Concept of PESTEL analysis for energy transition policy

3. Results and Discussion

Developing countries are starting to shift towards a low-carbon society as they strive to achieve stable growth and development. (Ali et al., 2019). The efficient management of these variables is germane to human well-being, sustainable development, and viable policy direction (Temiz Dinç & Akdoğan, 2019). As stated in the 2022 Energy and Mineral Resources (ESDM) sector performance achievement report by the Ministry of Energy and Mineral Resources (ESDM), electricity generation in Indonesia is still dominated by fossil fuels, as much as 42.1 Giga-Watt (GW) of electrical energy is generated from conventional coal Steam Power Plants (PLTU), 21.6 GW is generated from Gas / Gas and Steam / Engine and Gas Power Plants (PLTG / GU / MG), 5 GW from Diesel Power Plants (PLTD), and 12.5 GW from electricity generation using EBT. The largest composition of electricity generation sourced from renewable energy is from water energy sources which reach around 6,000 Mega-Watt (MW). For this reason, Indonesia is currently striving towards an energy transition about reducing GHG emissions and playing an active role in handling climate change issues in the world. Energy production and consumption have a significant impact on climate change because it contributes to CO2 emissions into the atmosphere through fossil fuels. Adoption by the United Nations Framework Convention on Climate Change (UNFCCC) at the Rio Conference in 1992 and the Kyoto Protocol in 1997, climate change was known as one of the most pressing global issues and remains a priority for world governments. The Paris Agreement requires participating countries to set targets for limiting global average temperature rise to well below 2°C above pre-industrial temperatures; The goal is to make further efforts to keep temperatures below 1.5 inches. As one of the countries with a high population level, even currently ranked number 4 in the world, Indonesia eventually also became one of the countries with the largest energy consumption in the world. In 2021, Indonesia ranks 9th in GHG emission contributing countries in the world, with emissions reaching 250 Mt CO2eq or around 42% generated from electricity generation activities. But when compared to the population, the resulting

emission figure is relatively lower than the average in the world, which is about 2 tCO2eq per capita. The government itself strives to continue to implement the GHG reduction plan to 31.89% with its own capabilities and 43.20% with international assistance and support. The current use of CO2 emissions to measure environmental quality is considered inappropriate because it does not cover all impacts that occur on the environment. Therefore, the switch to EF is considered better. There have been many studies examining RE and non-RE on EF. All of these studies have found that RE consumption reduces EF while improving environmental quality. The research also found that the promotion and use of green energy sources is necessary to achieve sustainable development because non-renewable energy contributes to environmental degradation. Currently, electricity generation activities are still monopolized by the state-owned company PLN. As the only entity that produces and distributes electricity to all corners of Indonesia, PLN is an unparalleled force in terms of implementing policies and regulations regarding energy issued by the central government. Local governments and the private sector have no contribution to be involved in national or regional energy planning due to the centralization of power. Whereas in the energy transition, it is very important to involve the community in planning, so that the principle of a just and equitable energy transition can be achieved (Van Der Schoor & Scholtens, 2015). In identifying interested parties to the energy transition scheme, each component has its own role and responsibility. The community as part of this component in addition to being a beneficiary of energy policy, also functions in the process of advocacy and negotiation with the government in efforts to transition to more environmentally friendly energy. Modern society, including Indonesia, currently has a very high dependence on energy, along with all daily activities that almost all use electrical energy.

Electricity supply in Indonesia is dominated by electricity generation on the island of Java, with installed capacity in 2022 reaching 45,835.45 Mega-Watt (MW), while outside Java it only reaches 23,044.15 MW. This difference is also a note in the distribution of energy in Indonesia, where equality between Java and outside Java should be an important part of energy policy, especially with the plan to move the country's capital to the island of Kalimantan. This is not easy to implement because Indonesia is an archipelagic country surrounded by the sea and is on an active path of volcanoes with high seismicity consequences. The energy produced during 2022 and the installed capacity can be seen in Figure 4.

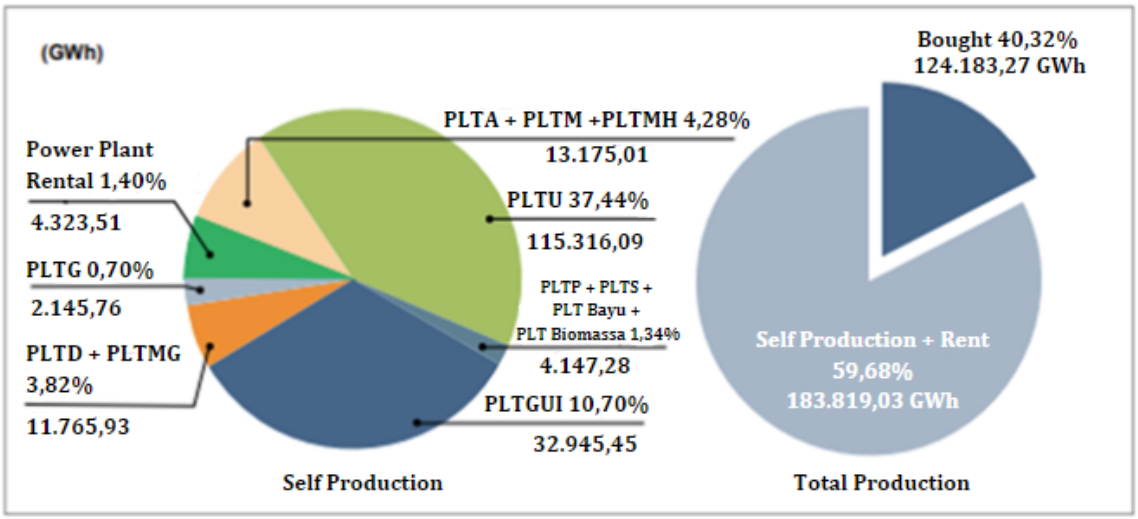

Fig. 4. Amount of energy produced in 2022
(PLN, 2022)

Regarding the energy transition plan, the author sees that there is a discrepancy between the government's plan and actual data during 2022, where electricity production from coal-fired power plants increased by around 1.2% when compared to 2021, even this

tendency increased by 8.8% if used on average from 2017 – 2022. However, this is in line with the achievement of domestic coal utilization which also increased in 2022 by 494 million tons. The world coal market has been changing, even as Indonesia has been increasing supply, and it seems that Indonesia's coal will enter the declining phase as soon. However, many international financial institutions have shown a decreased desire to profit from newly constructed coal-fired power plants, and others have stated that they intend to divest themselves entirely of coal assets over the next few years. Some economists think that a declining coal price is structural and, thus, a sign of a longer-term trend, even though prices have since started to climb (Katakey, 2017). Although the future of the global coal market is unclear, countries with coal reserves appear to be prioritizing mining. Miners in India and China are concentrating on providing energy for those countries. Worldwide news of falling coal prices does not appear to have brought about changes in social or economic policy; Major coal exporters such as Australia, Indonesia, South Africa, and Colombia drive the industry and offer strong political narratives about the socio-economic impacts of coal production and trade. This is interesting because it suggests that some producers do not believe there will be a sustained decline in the market or want to extract as much material as possible from the Earth before physical reserves become unprofitable. This technique carries many dangers. Some of these are the loss of forests and other natural heritage, the possibility that carbon-intensive infrastructure and financial assets will be hampered, and the opportunity costs of not supporting alternative socio-economic development options in and around mining areas. Over the past 15 years, new coal mining permits have increased rapidly in Indonesia, increasing production and exports. Deforestation, widespread corruption, illegal mining, disputed land claims, "sterilization" of resources, and unused mine sites are some of the problems that arise from this.

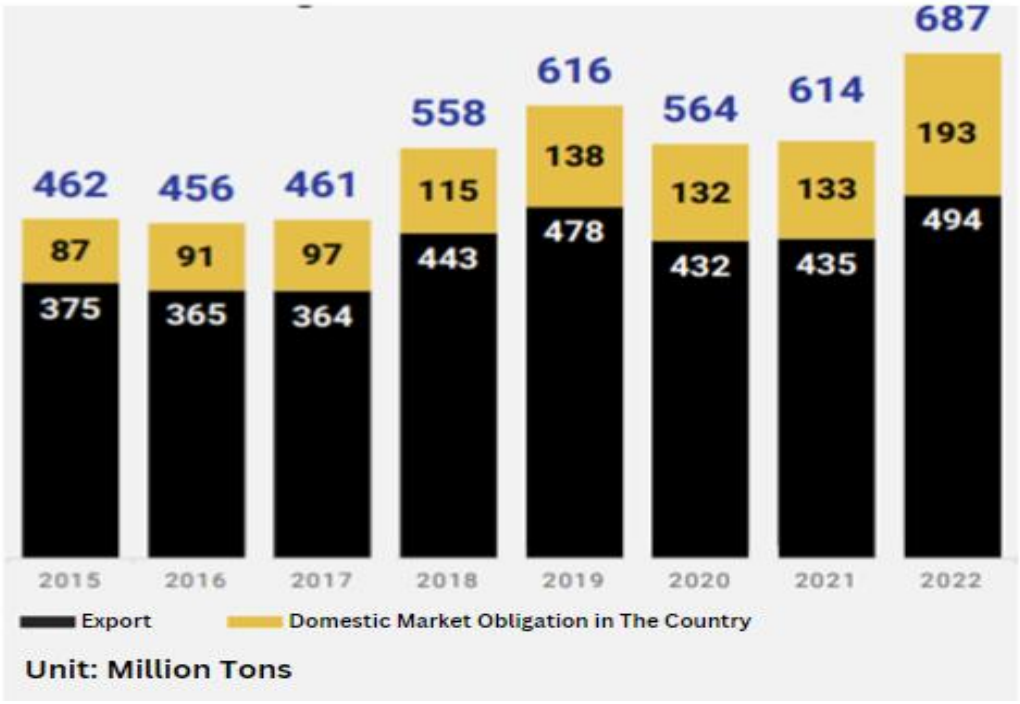

Fig. 5. Utilization of coal for domestic needs
(ESDM Sector Performance Achievement Report 2022 & Target Year 2023)

In this regard, there are still many roles of actors behind the use of coal that are the responsibility of the government, however, political factors also play a role in the policy of using coal for electricity generation needs in Indonesia. Several studies highlight this, especially since the emergence of a documentary titled "Sexy Killer" produced in 2019 by Dandhy Dwi Laksono. The film illustrates how the impact of coal exploration that does not pay attention to the environment and safety so that various social, economic, and health problems were raised. However, in relation to this research, what the author underlines is

the role of actors in the chain of coal exploration to distribution where many political elites in the government are involved not, as well as conglomerates that fund politics to gain space in the chain.

Mining Law No. 4 of 2009 stipulates that the central government is responsible for issuing large mining permits, while small-scale mining is regulated by local governments. But in fact, this is contrary to the existing reality that all energy policies and governance, including coal mining, are still controlled by the central government. This broken system is deeply rooted in the coal business chain in Indonesia and is difficult to break because of the many actors involved. Presidential Regulation No. 112 of 2022 concerning the Acceleration of Renewable Energy Development for Electricity Supply provides space for the construction of captive power plants. A captive power plant is a power plant that is built by the company and used for its own purposes. With the increase in Nickel downstream activities in Indonesia, the development of the establishment of captive power plants in the provinces of Central Sulawesi, Southeast Sulawesi, and North Maluku with a total capacity of 85% of the total capacity of captive power plants in Indonesia today (Riadi et al., 2023). The coal consumption for the captive power plant can reach about 22.6 million tons per year in Sulawesi Island only. This situation can detain Indonesia towards a GHG reduction plan and global action for climate change.

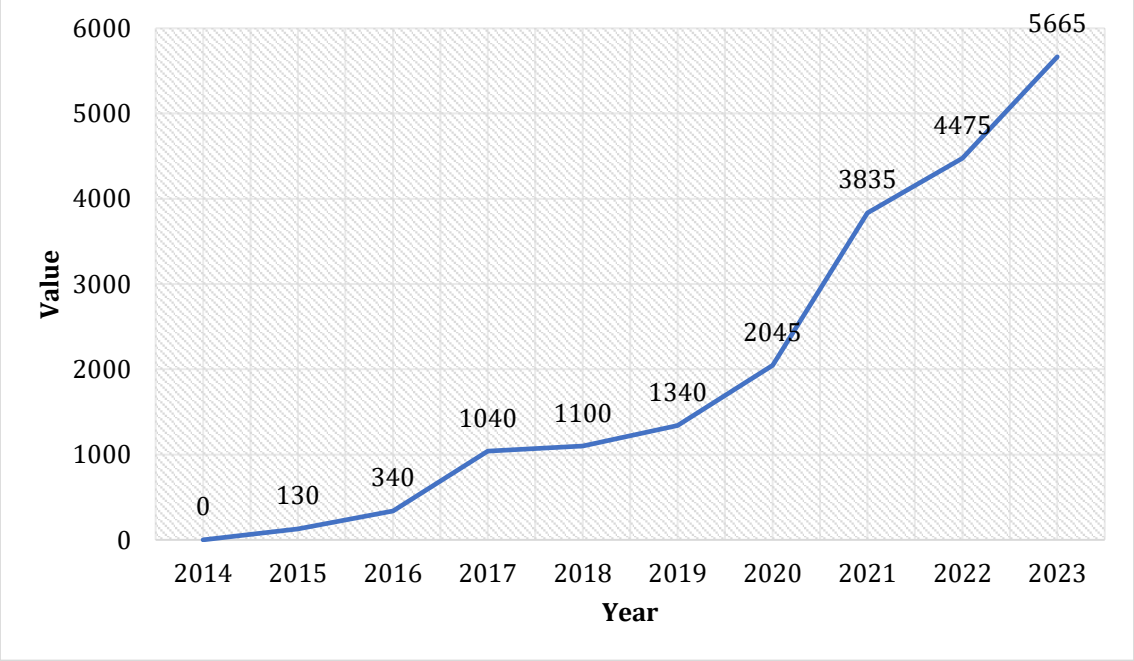

Fig. 6. The trend of increasing the capacity of captive coal-fired power plants in Sulawesi Island (Riadi et al., 2023)

Once again, the above discussion is evidence of the government's inconsistency in efforts to transition energy and reduce GHG emissions, because the dominance of greed with a wrapper for the sake of improving the national economy is very pronounced. The construction of this captive power plant is also exacerbated by investments made by companies from China that are mostly less committed to environmental management and protection. Identification of stakeholders at each level is important in formulating energy transition plans towards the use of renewable energy and GHG emission reduction. The PESTEL model analysis can be used as a basis for the detailed identification of the interests of each party and the correlation between each party (Yudha & Tjahjono, 2019), alongside with stakeholder mapping can be interpreted in Table 2. The political and social aspects merely equal as the most consideration in the level of government of Indonesia, such as for the Ministry of Energy and Mineral Resources and national-owned enterprises, which act as regulators and controllers in the energy sector.

Table 2. Identification of stakeholders in Indonesia's energy transition

Stakeholders	Political	Economic	Social	Technology	Environment	Legal
Commission VII of the House Representatives of the Republic of Indonesia	√				√	√
Budget Committee of the House of Representatives of the Republic of Indonesia		√				
President of the Republic of Indonesia	√				√	
Ministry of Energy and Mineral Resources	√	√				
Ministry of Labor			√			
Ministry of Environment and Forestry					√	
Ministry of Agrarian Affairs and Spatial Planning		√				
Ministry of Transportation			√			
Ministry Maritime Affairs and Fisheries					√	
Ministry of Finance		√				
Ministry of Trade		√		√		
Ministry of Industry	√					√
National Development Planning Agency	√					
National Energy Board				√	√	
Corruption Eradication Commission						√
Finance and Development Supervisory Agency						√
Supreme Audit Agency						√
Bank Indonesia (Central Bank)	√	√				
Constitutional Court						√
Investment Coordinating Board		√				
Directorate-General of Electricity and Energy Utilization		√				
Directorate-General of Renewable Energy		√				√
Directorate-General of Customs and Excise of the Ministry of Finance	√					
State-owned Enterprises	√	√				

Regionally-owned Enterprises	√	√			
National Banks		√			
Regency Government				√	√
Provincial Government				√	√
PLN (State Electricity Company)		√			
Independent Power Producers	√		√	√	√
Investors	√				
Non-Governmental Organization					√
Indonesian Chamber of Commerce	√	√			√
The public			√		

(Yudha & Tjahjono, 2019)

However, based on the analysis of Table 2 above; the researcher found that some of the identification of each actor's involvement was merely correctly identified. For example, most of the central governmental bodies, the National Energy Board known as "Dewan Energi Nasional (DEN)" and the ministries' are supposed to be identified in the political column since all of them have direct line reporting to the President. The DEN has an obligation to help the President as the primary stakeholder to determine and develop the national energy policy; the DEN itself is formed as a mandate to the Indonesian Law No. 30 of 2007. Among its responsibilities, formulating and developing national energy policies are the main, including conducting cross-sectoral coordination in accordance with the policy development as well as the implementation. One of the DEN products is KEN, which was developed in a way to achieve national energy security and stabilization. DEN was helped by related ministries along the process. However, as we described in the example of coal policy, the DEN and ministries' decisions are mostly not independent, dictated by the ruler with many agenda and actors also behind "the scenes". Politics is not something that stands alone, geography is also involved in setting it up. By that, every country, including Indonesia, must be forced to follow the majority market.

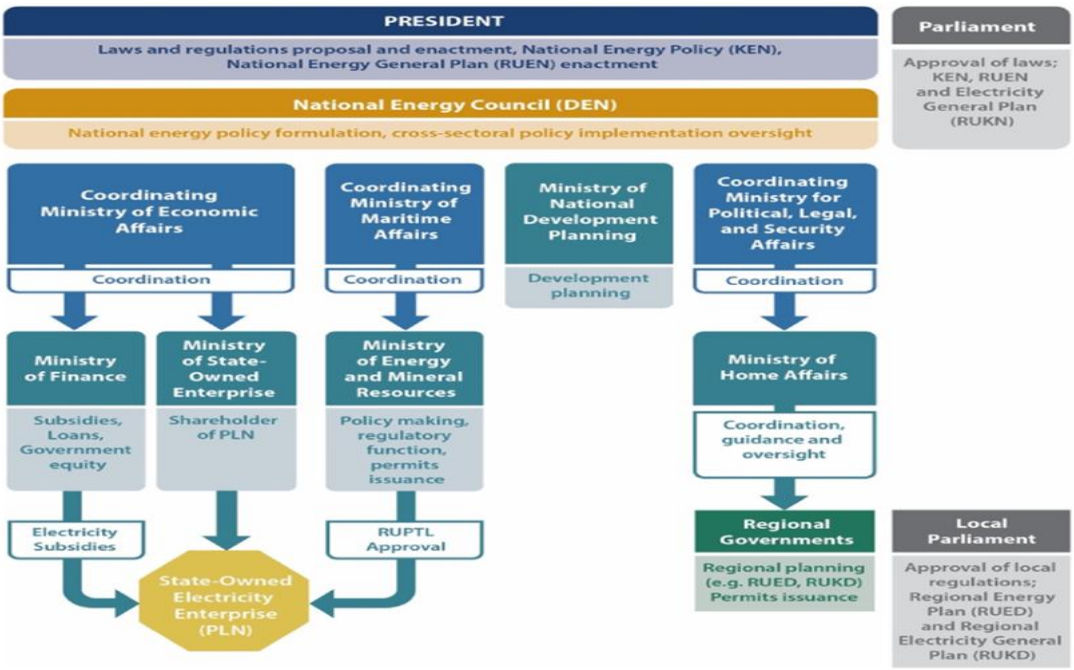

Fig. 7. Multi-scalar institutional arrangements related to energy planning in Indonesia (Setyowati & Quist, 2022)

While the governmental body is mostly involved in the discussion and some other non-government organizations, the involvement of the public is relatively zero. The public should be involved in the energy transition process at the minimum level such as leveraging the awareness of energy efficiency and initiative of community-based energy alternatives (for example: solar panels), or seated in the discussion in the policy itself. divides aid to the fossil fuel and clean energy industries into four categories: unconditional support for fossil fuels, conditional support for fossil fuels, and conditional support for clean energy. Components of justice are discussed. Taking into account climate targets and other environmental considerations, this policy aims to unconditionally protect and promote the clean sector and the fossil sector. Components of justice include procedural justice, which is reflected in policies, and restorative justice, which is determined by the type of policy and consideration of environmental impacts and efforts to reduce them.

According to Mayer (2009), there are two main principles in economic policy theory. First, the number of policy instruments must be equal to or greater than the number of targets to achieve all targets. Second, when there are conflicting target variables, policymakers should use social welfare functions to determine the most effective combination of instruments to achieve a consistent set of targets. According to research conducted by Sumarno et al. (2022), Indonesia received the lowest score of 0.44 in the category of fulfilling energy transition justice compared to countries participating in the OECD (Organization for Economic Co-operation and Development) and countries not participating in the OECD. However, each of these countries received relatively low scores. Many policies support green industries, fossil fuels, or both, but do not take action to reduce the impacts of climate change. As a result, it is critical for Indonesia and other countries to consider implementing policies and actions that support clean energy to achieve climate goals and mitigate environmental impacts.

However, the factor of openness in the preparation of national energy policies, energy transition plans both at the national and sub-national levels, and the involvement of all parties should be the key to energy transition in fulfilling sustainable development, even though political influences could not be avoided. The limitation of this research could be incorporated in another research, involving all stakeholders in the mapping process to gain any broader perspectives about the energy transition.

4. Conclusion

Energy policy and management in Indonesia is a very complex content and can change with changes around the world. However, the energy service system and the provision of national electricity still seem monopoly and centralization of the government, central government, and other interested parties have not participated much. All parties involved in planning can see the dynamic nature of the country's energy transition. This research aims to gain an understanding of how political nuances affect the transition process, find specific context components that can encourage or stop local action, and create new spaces for action derived from the overarching energy planning process. This research shows that the energy planning process is not a technically neutral problem. In contrast, policy and regulation-making is a political process that involves the interaction of interested parties at the national and sub-national levels. These actors seek to claim space and assert their role in the energy transition.

In addition, the research explains how territorial energy processes can help overcome policy barriers at the national level and drive local action for the energy transition. However, the ability of subnational actors to influence the trajectory of transition has been shaped by several factors, such as political leadership, society, and broader stakeholder involvement in the process, as well as political and social economic structures. The research was conducted in Indonesia, but the results and policy consequences can be applied to other developing countries, especially in the Southeast Asian region in the direction of transitioning to low-carbon energy. It's important to consider how quickly and how much it will take to reach net-zero emissions and the potential social consequences. This certainly

involves interested parties at every level of existing governance. By identifying interested parties, their respective rights and obligations, and contributions to pursuing the transition to low-carbon energy can be seen. Realizing the ideals of the energy transition requires active participation from all interested parties, including the public and the private sector. Thus, the energy transition will become more just and inclusive for everyone in Indonesia. At present, the national government can only play a monopoly role, without involving other parties. Political interests are still very thick in every policy and regulation that applies and becomes a sensitive issue during the political year. Therefore, to transform the electricity market and encourage public and private participation, several regulatory approaches can be applied, such as: separating monopoly power providers' control over electricity generation and distribution; regulating policy instruments in a clear and organized manner without political elements; providing mechanisms to encourage technological investment in renewable energy; and facilitate the inclusion of independent power producers from the private sector in sustainable development programs; and provide clear incentives to the private sector participating in the energy transition and GHG emission reduction.

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Author Contribution
In general, each team member works together to make and ensure that this paper complies with the requirements for making it. Apart from that, each team member also complements each other in deciding the theme of the writing idea and arranging the writing so that it complies with the rules. Therefore, each team member will be responsible for ensuring the completeness and review of each chapter.

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