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Climate-Energy Governance Model in Indonesia

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Strengthen National Climate Policy Implementation:
Comparative Empirical Learning & Creating Linkage to Climate Finance
The project explores how international climate finance can support the implementation of NDCs in emerging economies and EU countries through comparative analyses and by providing a better understanding of the interface between finance and policy implementation.

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IKI INTERNATIONAL CLIMATE INITIATIVE

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Based on a decision of the German Bundestag

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List of Abbreviations

BUR	Biennial Update Report
CIPP	Comprehensive Investment and Policy Plan
CfCCMFP	Center for Climate Change and Multilateral Financing Policy/ Pusat Kebijakan Perubahan Iklim dan Pembiayaan Multilateral
CMfMIA	Coordinating Ministry for Maritime and Investment Affairs/ Kementerian Koordinator Bidang Maritim dan Investasi
NEC	National Energy Council/ Dewan Energi Nasional (DEN)
DGCC	Directorate General of Climate Change/ Direktorat Jenderal Pengendalian Perubahan Iklim
DGE	Directorate General of Electricity/ Direktorat Jenderal Ketenagalistrikan
DGFRM	Directorate General of Budget Financing and Risk Management/ Direktorat Jenderal Pengelolaan Pembiayaan dan Risiko
DGOG	Directorate General of Oil and Gas/ Direktorat Jenderal Minyak dan Gas Bumi
DGREEC	Directorate General of Renewable Energy and Energy Conservation/ Direktorat Jenderal Energi Baru Terbarukan dan Konservasi Energi
DMO	Domestic Market Obligation
DoE	Directorate of Environment/ Direktorat Lingkungan Hidup
DoEMMR	Directorate of Energy, Mineral, and Mining Resources/ Direktorat Sumber Daya Energi, Mineral dan Pertambangan
DpDF	Deputy of Development Financing/ Deputi Bidang Pendanaan Pembangunan

DpMANR	Deputy of Maritime Affairs and Natural Resources/ Deputi Bidang Kemaritiman dan Sumber Daya Alam
EFMA	Environmental Fund Management Agency/ Badan Pengelola Dana Lingkungan Hidup
ENDC	Enhanced NDC
FFDA	Fossil fuels developer associations
FPA	Fiscal Policy Agency/ Badan Kebijakan Fiskal (BKF)
FOLU	Forestry and Other Land Uses
GHG	Greenhouse Gas
GoI	Government of Indonesia
IEA	International Energy Agency
IICA	Indonesia Investment Coordinating Agency/ Badan Koordinasi Penanaman Modal
IPCC	Intergovernmental Panel on Climate Change
IPPs	Independent Power Producers
JETP	Just Energy Transition Partnership
KEN	Kebijakan Energi Nasional/ National Energy Policy
LTS-LCCR	Long-Term Strategy on Low Carbon and Climate Resilience
MDBs	Multilateral Development Banks
MoEF	Ministry of Environment and Forestry/ Kementerian Lingkungan Hidup dan Kehutanan
MoF	Ministry of Finance/ Kementerian Keuangan
MoEMR	Ministry of Energy and Mineral Resources/ Kementerian Energi dan Sumber Daya Mineral
MoNDP	Ministry of National Development Planning Agency/ Badan Perencanaan Pembangunan Nasional
MoSOE	Ministry of State-Owned Enterprises/ Kementerian Badan Usaha Milik Negara
NCCC	National Climate Change Council/ Dewan Nasional Perubahan Iklim
NDC	Nationally Determined Contribution
NGC	National Gas Company/ Perusahaan Gas Negara (PGN)
NGOs	Non Governmental Organisations
NRIA	National Research and Innovation Agency/ Badan Riset dan Inovasi Nasional
NZE	Net Zero Emissions
PEPs	Politically Exposed Persons
Pertamina	Pertambangan Minyak dan Gas Bumi Negara/ National energy company
SEC	State Electricity Company/ Perusahaan Listrik Negara (PLN)
SOE	State owned enterprises/ Badan Usaha Milik Negara (BUMN)
REDA	Renewable energy developer associations
REDD+	Reducing emissions from deforestation and forest degradation
RIPIN	Rencana Induk Pembangunan Industri Nasional/ National Industry Development Master Plan
RUED	Rencana Umum Energi Daerah/ Regional Energy General Plan
RUEN	Rencana Umum Energi Nasional/ National Energy General Plan
RUKN	Rencana Umum Ketenagalistrikan Nasional/ National Electricity General Plan
RUPTL	Rencana Usaha Penyediaan Tenaga Listrik/ Electricity Supply Business Plan
SGGP	Sustainable Green Growth, Climate, and Environment Program
SIEP	Sustainable and Inclusive Energy Program
SNA	Social Network Analysis
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WMO	World Meteorological Organisation

Chapter one

Introduction

1

1. Introduction

In the evolution of the United Nations Framework Convention on Climate Change (UNFCCC), the 2015 Paris Agreement denoted a turning point in the global climate governance on emission reduction (McGee & Steffek, 2016). Legally binding emission reduction targets under the Kyoto Protocol were replaced by voluntary contributions from all countries under the Paris Agreement (McGee & Steffek, 2016; Kuyper et al., 2018). The Paris Agreement offers a new approach to contributing to reducing emissions (Held & Roger, 2018).

Indonesia has been actively involved in international climate pledges. The ratification of UNFCCC on 5 June 1992, followed by enacting Law No. 6/1994, signifies the dawn of Indonesian climate governance. Indonesia also demonstrated its important role in emission reductions to increase climate change resilience by ratifying the Paris Agreement on 22 April 2016, followed by enacting Law No.16/2016. In the First Nationally Determined Contribution (NDC), Indonesia committed itself to reducing Greenhouse Gas (GHG) emissions by 29% using its resources and up to 41% with international support from business-as-usual emissions by 2030 (Republic of Indonesia, 2016). In July 2021, Indonesia submitted an updated NDC and compiled the Long-Term Strategy on Low Carbon and Climate Resilience (LTS-LCCR) as a country committed to achieving Net Zero Emissions (NZE) by 2060 or sooner. However, the updated NDC does not change the GHG emission reduction target. Indonesia's commitment and contribution to climate change was again demonstrated through Indonesia's Enhanced NDC (ENDC) document in November 2022. In the ENDC, the target of reducing emissions with own resources increases from 29% to 31.89%, and with international support increases from 41% to 43.2% in 2030 (Republic of Indonesia, 2022).

According to Indonesia's First Biennial Update Report (BUR) submitted to the UNFCCC in January 2016, the main contributing sector to Indonesia's GHG emissions is the Forestry and Other Land Uses (FOLU) sector, followed by the energy sector. Based on the NDC simulation, emissions from the energy sector will continue to rise until 2030, while the FOLU sector will decrease gradually (Dewi, 2019; KLHK, 2020). The simulation also shows that the energy sector will overtake the FOLU sector between 2020-2030 and is projected to turn into the largest emitter by 2030. At the global level, the International Energy Agency (IEA) shows that GHG emissions caused by energy production grew 0.9% and reached 36.8 gigatons in 2022. Aengenheyster et al. (2018) stated that without global decarbonization efforts from all countries, the global temperatures will cross 2°C as soon as 2035.

To support the energy transition, the Government of Indonesia (GoI), through the National Energy Policy (KEN), has set a target for the renewable energy mix in 2025 of at least 23% and 31% in 2050 (National Energy Council, 2022). Nevertheless, renewable energy share in the Indonesian energy mix only reached 10.4% in 2022 (IESR, 2022). This number has decreased by 1,1% compared to 2021, which was 11.5%. At the same time, the coal share in the primary energy mix increased to 43% over time. Without significant reforms, the 23% target seems even more unattainable. Regarding energy transition, social justice should generally be coordinated with policy packages for transformation (Beuermann & Brandemann, 2021). A just transition of the energy sector means that the burdens and benefits of the energy transition are equally distributed according to social justice (World Future Council). According to Makgetla (2021), the just transition aims to enable communities that depend on emissions industries to find alternative livelihoods and mitigate the effects of climate change on

working people and people with low incomes. The just transition could allow countries to develop more ambitious climate policies (Beuermann and Brandemann, 2021). Therefore, the just transition concept should be integrated with the climate-energy policies to secure a transition to net zero emissions.

A few issues were found during the first-year study regarding climate-energy governance in Indonesia. Many actors from various institutions are involved in climate energy governance. However, there are some conflicting roles due to fundamental differences in job descriptions for each institution. The process of promulgating certain policies and regulations is still shaped by the informal practices between key actors, especially in the energy sector. Informality means the decision-making process is un-codified and non-institutional; the relationships are not formalized or occur outside formal structures (Harsh, 2013; Ledeneva, 2018). Informal practices can offer new mechanisms to tackle problems that formal practices struggle to solve. However, it may weaken transparency and accountability and enhance difficulty in developing coordinated and integrated policies (Peters, 2006; Ayres, 2016). Informal practices in Indonesian climate governance contribute to the gap between high-level goals in political discourse and implementation, especially in the energy sector. In the energy policy landscape, the GoI has set ambitious targets to achieve emission reduction targets, such as the National Energy Policy, the National Electricity General Plan (RUKN) 2019-2038, the Electricity Supply Business Plan (RUPTL) 2021-2030, LTS-LCCR 2050, and the ENDC 2022. However, the energy-related policies are seen as a setback towards the national renewable energy target by still allowing the use of coal until 2050. The findings from a previous study also elaborate on the role of the private sector in renewable energy development. Currently, the financing and investment for renewable energy are still limited then fossil fuel. Policy uncertainty, high risk, and low return rate in renewable energy development, resulting in low investment realization in the renewable energy sector. To sum up, there is a gap between the GoI's pledge to NDC and NZE, national policies, and programs to achieve it.

The shift in global governance away from a legally binding top-down approach to a bottom-up framework focused on nationally determined contributions heightens the role of robust national governance frameworks. To fulfil climate commitments, the governance process, including objective formulation, actors' mobilization, and governance instrument design and implementation within the national climate governance, also deserves great attention (Tan et al., 2022). Well-structured climate governance can enhance long-term system stability and support transformational potential in emissions reduction and policy development. Finding ways to improve Indonesian climate-energy governance for accelerated achievement of climate commitments starts with understanding the systems currently shaping the development and implementation of climate-related policies and actions.

Indonesia's climate focus has historically been on addressing deforestation, while the energy sector is a significant contributor that needs to be fully understood. This final-year study tries to synthesize the first- to third-year findings to better understand the Indonesian climate governance model, especially in the energy sector. This study aims to identify an existing climate governance model for the Indonesian energy sector, with the research question being "What would the existing climate governance model look like for the Indonesian energy sector?" The scope of this research is Indonesian climate governance in the energy sector. This study uses a climate governance framework to define the climate-energy governance model in Indonesia, which consists of four components: key actors/institutions, key policies, policy processes, and financing. Understanding the existing model of climate-energy governance, including actors/ institutions, policies/ regulations, policy processes,

and financing, is expected to support the accelerated achievement of Indonesian climate commitments. Practical recommendations to the government related to the findings of the governance model are also discussed in this study.

This document begins with a background of the study, followed by an overview of climate change governance at the global and national levels, climate governance framework, the methodology used in this study, the Indonesian energy outlook in 2023, and analysis and discussion on the climate governance model in the Indonesian energy sector. The final section summarises conclusions and policy implications.

Chapter two

Climate Change Governance

2. Climate Change Governance

2.1 Global Climate Governance

Climate change is one of the most complex challenges in the global environmental governance of this century. Climate change has affected almost all aspects of social and economic development. Therefore, global climate change mitigation and adaptation measures are needed. Global climate governance emerged as mechanisms and measures established by states or other authorities aimed at climate change risk mitigation, adaptation, and prevention (Jagers & Striplle, 2003). The Intergovernmental Panel on Climate Change (IPCC) has observed the potential role of governance in strengthening climate change mitigation and adaptation. Governance refers to the process of interaction and decision-making among actors in a common problem that reinforces and creates social norms and institutions (Kooiman, 2003; Hufty, 2011). The climate governance discourses tend toward an understanding of the factors that drive self-regulated climate action, such as leadership, mutual learning, and networks (Heinen et al., 2019). In global climate governance, several actors exist, including governments, international organizations, and the private sector, such as corporations and civil society organizations (Andonova et al., 2009; Tosun et al., 2016). The World Bank states that climate governance uses institutions to address governance failure, strengthen incentives and build capacity for climate change.

The early stages of the climate regime were signified by relatively rapid progress through the global climate policy-making agenda in 1980, resulting from an increasing awareness of environmental issues and the concern of scientists and politicians (Bolin, 2007; Schneider, 2009). In 1988, the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP) established Intergovernmental Panel on Climate Change (IPCC) as a source of scientific, technical, and socioeconomic information for the establishment of the UNFCCC (IPCC, 2010). The UNFCCC played an essential role as a framework for international cooperation to respond to climate change by limiting the increase in global temperature and coping with its impacts. The UNFCCC adopted in 1992 was signified as the central node in global climate governance organization, arrangement, and operation (Kuyper et al., 2018; Tan et al., 2022). However, due to the uncertainty of the responsibility for global warming, the negotiations under the UNFCCC stagnated for several years (Gupta, 2014).

The Second Assessment Report (1995) provided important materials for the Kyoto Protocol, which the latter was later adopted as the world's first GHG emissions reduction treaty and thus set binding targets for emission reduction in the Global North countries (UNFCCC, 2008). The Kyoto model was considered to offer a long-term design for global climate governance that facilitates more ambitious emission reduction commitments (McGee & Steffek, 2016). However, in 2014 IPCC established the Fifth Assessment Report (AR5) as the scientific input into the Paris Agreement, adopted in 2015. The Paris Agreement denoted a turning point in designing global climate governance on emission reduction (Held & Roger, 2018). There has been a shift from legally binding emission reduction targets in the Kyoto Protocol towards voluntary contributions from countries under the Paris Agreement (McGee & Steffek, 2016; Kuyper et al., 2018). Countries under the Paris Agreement are allowed to organize their climate commitments, so the success of the Paris Agreement ultimately depends on

national action preferences and sufficient local institutional capacity for effective climate policy implementation (Coen et al., 2021; Tan et al., 2022). The operation of the Paris Agreement as the global framework will depend on a range of complementary actions, such as politics within governments where national pledges are made and implemented (Held & Roger, 2018). The dynamics of domestic politics become important, where governments are compelled to take ambitious climate action. Moreover, the mobilization of particular institutions and constituencies within states and a range of sub-state and non-state actors also determine the success of implementing the Paris Agreement. International organizations will also play an important role in helping the states to address the climate change problem by providing resources and expertise. To sum up, the actions of state and non-state stakeholders need to be enhanced to move the global economy toward a decarbonized state. The involvement of state and non-state actors in climate governance can be conceived in the context of multilevel governance. Multilevel governance is multiscale and multisectoral, not limited to government actors but also involves private actors and civil society at all levels (Janicke, 2017). Not only all scales but a multilevel governance approach can also address all relevant interest groups in global climate governance (Janicke, 2017). Janicke et al. (2015) also mentioned that the global system of multilevel climate governance has emerged as a strong opportunity structure for innovation diffusion and interactive learning as the basis for smart climate strategies.

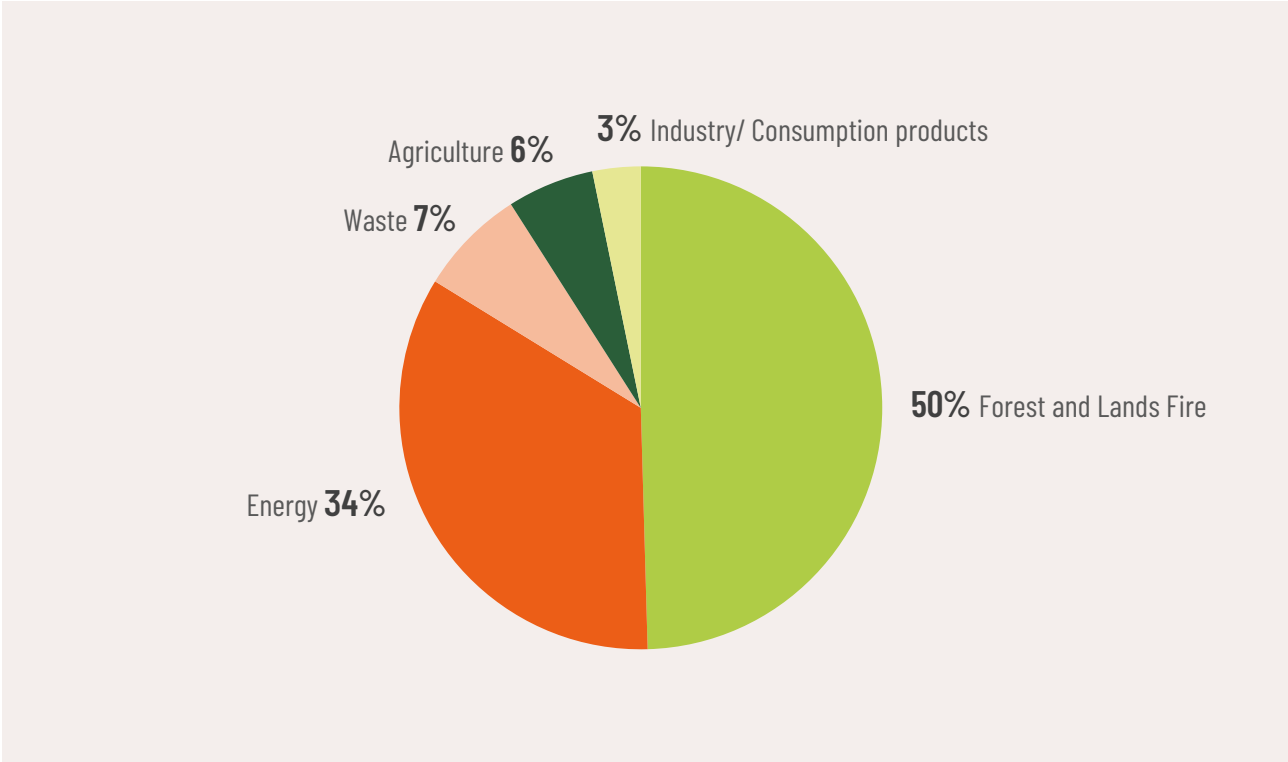
2.2 National Climate Governance

The governance process within the national climate governance also deserves great attention (Tan et al., 2022). The governance process includes objective formulation, actors' mobilization at various levels, and governance instrument design and implementation. National climate institutions play a role in structuring the climate policy-making process and shaping climate policy ambition and performance (Guy et al., 2023). To fulfil climate commitments, countries have undertaken strategies such as building science bodies, enacting climate laws, and creating new climate-related agencies. Among countries under the Paris Agreement, Indonesia has emerged as a country that plays an important role in international climate pledges. Indonesia demonstrated its climate change commitment by ratifying the UNFCCC in 1992 and enacting Law 6/1994. Indonesia also ratified the Kyoto Protocol through Law 17/2004 in 2004. However, during the 1990s, the Government of Indonesia (GoI) did not have a special institution assigned to deal with climate change issues. Then, during the 2005-2020 period, the implementation of policies and programs related to climate change was supported by the Deputy for Natural Resources Conservation Improvement and Environmental Degradation Management of the Ministry of Environment. Indonesia also demonstrated its important role in contributing to global efforts in climate change through the Thirteenth Conference of the Parties (COP13) of the UNFCCC in Bali in 2007, which produced The Bali Action Plan.

To oversee the development and implementation of Indonesian climate policy, President Susilo Bambang Yudhoyono (SBY) established the National Climate Change Council (NCCC) in 2008 through the enactment of Presidential Regulation 46/2008. In 2009, under SBY's leadership, a significant change in climate commitment was made when Indonesia participated in the G20 Leaders' Summit in Pittsburgh, USA. The president announced Indonesia's commitment to reduce GHG emissions by 26% unconditionally and up to 41% conditionally from business-as-usual (BAU) emissions by 2020 (Cabinet Secretariat of the Republic of Indonesia, 2014). According to Presidential Regulation 61/2011, climate

change mitigation action to reduce GHG emissions includes agriculture, forestry and peatlands, energy and transportation, industry, waste management, and other supporting activities. In the Greenhouse Gas (GHG) Inventory and Monitoring, Reporting, and Verification (MRV) by the Ministry of Environment and Forestry in 2021, Indonesia produced greenhouse gas emissions of 1,866,552 gigagrams of carbon dioxide equivalent (Gg CO_2e) in 2019. According to the report, in 2019, greenhouse gas emissions were dominated by the Forest sector and land fires (924,853 Gg CO_2e), followed by the energy sector (638,808 Gg CO_2e), the waste sector (134,119 Gg CO_2e), the agriculture sector (108,598 Gg CO_2e) and the industry/consumption products sector (60,175 Gg CO_2e). Figure 1 shows the percentage of Indonesia's GHG emissions in 2019.

Figure 1 — The Percentage of Indonesia's GHG Emissions in 2019



Sources: MoEF, 2021

Because most of Indonesia's emissions come from forest fires and deforestation, Indonesia received international support from Norway for implementing the Reducing Emission from Degradation and Deforestation Plus (REDD+) scheme. The President establishes the REDD+ Agency through Presidential Decree No 62/2013 to follow up on the agreement. The REDD+ Agency aims to reduce GHG emissions from deforestation, forest degradation, and peatland conversion. However, the REDD+ was deemed ineffective in implementation actions at the regional level, for instance, in Central Kalimantan Province, which suffers high degradation and deforestation (Lestari, 2019). In the current presidency, the National Agency for REDD+ is merged into the Ministry of Environment and Forestry (MoEF), and the NCCC has also been dismantled.

Under the new government of President Joko Widodo, Indonesia strengthened its climate change resilience by ratifying the Paris Agreement in 2016, followed by Law No. 16/2016. The target regarding GHG emissions reduction was then reformulated to 29% unconditional and up to 41% conditional

through the NDC document in 2016. In 2022, Indonesia's commitment to climate change was again strengthened through the ENDC. In the ENDC document, the target of GHG emissions reduction with own resources increases from 29% to 31.89%, and with international support increases from 41% to 43.2% in 2030. Under the current presidential leadership, climate change management in Indonesia is under the authority of the Ministry of Environment and Forestry (MoEF) and the Ministry of National Development Planning Agency (MoNDP). In the MoEF, climate change issues are specifically under the responsibility of the Directorate of Climate Change Mitigation and the Directorate of Climate Change Adaptation. The MoEMR has also become an important institution in the energy sector. In Indonesian energy-related policy, the National Energy Council (NEC) has emerged as the leading institution in energy policy formulation and implementation. NEC's main roles include drafting the National Energy Policy (KEN), establishing the National Energy General Plan (RUEN), implementing mitigation measures against energy crises, and monitoring the multi-sectoral implementation of KEN. On the other side of the energy sector, especially in the electricity sector, the State Electricity Company (SEC) has also become a central stakeholder in coordination with the Directorate of Electricity of the Ministry of Energy and Mineral Resources (MoEMR). As a State-Owned Enterprise (SOE), SEC's role is to buy electricity from large and small IPPs and then sell it to customers. SEC also plays a role in formulating RUPTL in the energy policy landscape, which serves as a guideline for developing electric power systems in SEC's operational area.

In the Indonesian climate-energy governance, financing is the major technical challenge in the program implementation. To tackle the financing issues, MoEF collaborated with the Coordinating Ministry for Economic Affairs (CMfEA) to establish a new trust fund manager, namely EFMA (Environmental Fund Management Agency) in 2019. According to Ministerial Regulation of Finance 124/2020, EFMA has responsibilities to manage and allocate the environmental fund, including climate fund, both international and national sources. As the funding windows for other sectors, including the energy sector, EFMA plays an important role in unraveling the overarching issue of renewable energy project bankability.

2.3 Key Takeaways

1. The Paris Agreement denoted a turning point in designing global climate governance, countries under the Paris Agreement are allowed to organize their climate commitment. The success of the Paris Agreement depends on national action and adequate local institutional capacity for climate policy implementation.

2. Climate governance in Indonesia was initiated since ratifying the UNFCCC in 1992. Among the countries party to the Paris Agreement, Indonesia has emerged as a country that plays an important role in global climate governance. Indonesia's climate commitment was strengthened to 31.89% with its resources and up to 43.2% with international support in the ENDC document submitted by 2022.

3. The MoEF and the MoNDP are the primary institutions of climate change management. The MoEMR also becomes an important institution in the energy sector as the second largest contributor to the NDC target. In the Indonesian energy sector, other actors can be identified through two main focuses: energy policy and electricity policy. In the energy policy, NEC has become central in formulating and implementing energy-related policy. In the electricity policy, SEC has also become a central stakeholder in preparing RUPTL, which serves as a guideline for developing electric power systems in SEC's operational area.

4. Financing is the major technical challenge in Indonesian climate-energy governance. MoEF collaborated with the Coordinating Ministry for Economic Affairs to tackle the financing issues to establish EFMA in 2019. EFMA is important in unravelling the overarching issue of renewable energy project bankability.

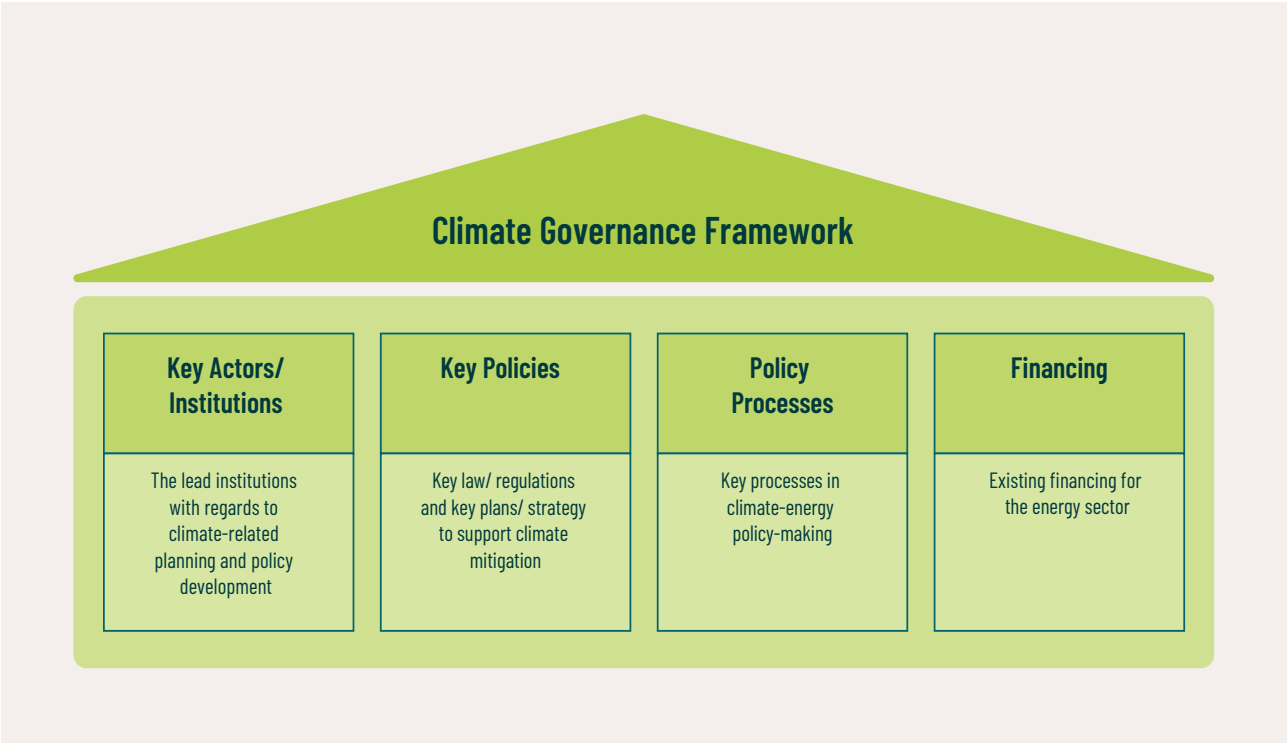
Chapter three

Climate Governance Framework

3. Climate Governance Framework

Climate governance requires urgent attention related to its relevance to the success of the Paris Agreement implementation (Duwe et al., 2017). Improving Indonesian climate-energy governance for energy transition starts with understanding the systems that currently shape the development and implementation of relevant policies and measures. This study identified the Indonesian climate-energy governance model through a climate governance framework. According to Rudinger et al. (2018) national climate governance framework "encompasses the institutional set-up, determining the key actors, their powers and responsibilities, as well as key processes for decision-making, which usually include planning instruments such as long-term strategies, means of implementation such as action plans or policy packages and monitoring and review mechanisms." In addition, financial support is also identified as one of the components developed in the climate governance framework. Climate finance and investment have emerged as a solution for reducing emissions and addressing the climate crisis (Lee et al., 2022; Georgieva & Adrian, 2022). Based on the findings of previous studies related to climate-energy governance in Indonesia and the literature review related to climate governance framework, the components of climate governance discussed in this study are limited to stakeholder engagement (key actors/institutions), policy outcomes (key policies), the policy-making process (policy process), and climate-energy financing (financing) (see Figure 2).

Figure 2 — Climate Governance Framework



Sources: Author's Analysis, 2023

3.1. Key Actors/Institutions

The governance framework creates specific institutions to ensure the involvement of stakeholders at all stages of the policy process (Rudinger et al., 2018). Stakeholder involvement can enhance the stability of the climate governance framework system. It can also support transformational potential through an active role in emissions reduction and policy development (Duwe et al., 2017). In addition, stakeholder involvement in climate governance is meaningful and creates a sense of ownership. According to Rudinger et al. (2018), the direct participation of stakeholder groups in the various phase of climate policy and elaboration and implementation is essential to strengthen political support from all actors, which also helps to increase transparency and compliance for actual policy implementation. However, stakeholder involvement also creates challenges in climate governance (Rudinger et al., 2018). In this study, the key actors/institutions component is used to identify the actors involved in Indonesian climate-energy governance and determine the lead institutions with regard to climate-related planning and policy development.

3.2. Key Policies

The existence of a legal basis signals a strong commitment by the government. A strong legal basis in climate governance supports establishing clear climate-related institutional procedures and mandates, facilitates the creation of new dedicated bodies, and can provide them with important oversight powers (Duwe et al., 2017). The legal basis is key to enhancing the climate change framework's credibility, commitment, and overall stability, increasing governments' responsibility to deliver climate implementation and providing a clear anchor for all subsequent climate policies (Rudinger, 2018). National policies or regulations remain key to enabling a rapid transition towards low-carbon energy (Setyowati & Quist, 2022). In this study, the key policies component is used to see the consistency of energy-related policies in Indonesia as the government's commitment to achieving the energy transition.

3.3. Policy Processes

The policy processes in climate governance are used to identify the key process in energy policy-making, including agenda setting, policy formulation, and government decisions, actions, and statements (Blomkamp et al., 2018). The key process identified in this study includes the government's commitment to climate change, government leadership, decision-making process, and quality of government decision-making. According to Duwe et al. (2017), effective climate governance relies on commitment stability because achieving results is an inherently long-term process. Duwe et al. (2017) also stated that the commitment of individual political leaders could be seen as a contributing driver in achieving climate commitment. In this study, government commitment was identified through the national commitment in Indonesia to stimulate increased climate mitigation ambitions to limit warming to 1.5C. Moreover, leadership is also essential in climate governance to effectively address climate change risks. Adopted from Meijerink & Stiller (2013), leadership in climate adaptation needs to influence the policy process so that the policy can be accepted and implemented; enhance

connectivity across different policy-making levels, sectors, and actors; enhance the capacity of society to learn in response to climate change; and increase the capacity of governance networks concern with climate change. This study identified leadership in climate governance through government support and the power of climate change lead agency in achieving the NDC targets. The quality of policies also plays an important role in climate governance. The policy-making process must emphasize accountability, transparency, and trustworthiness of the government's transition-related actions.

3.4. Financing

Appropriate financing for climate mitigation would be determinant in supporting countries to achieve more ambitious emissions reduction targets. Therefore, a systemic understanding of climate finance flows is needed (Hsu et al., 2020). At the global level, a challenge for multilateral organizations involved in international climate finance (Browne, 2022). At the national level, issues of capacity and appropriateness of national budget processes for climate finance are important considerations in the management of climate finance (Worker, 2017). This study uses the financing component to identify the existing finance in the energy sector, especially renewable energy.

3.5 Key Takeaways

1. To improve Indonesian climate governance, especially in the energy sector, the current system is identified through a climate governance framework consisting of key actors/institutions, key policies, policy processes, and financing.

2. The governance framework creates specific institutions to ensure the involvement of stakeholders at all stages of the policy process. Stakeholder involvement can enhance the stability of the climate governance framework system and support transformational potential through an active role in emissions reduction and policy development.

3. A legal basis signals a strong commitment by the government. The legal basis is key to enhancing the climate change framework's credibility, commitment, and overall stability, increasing governments' responsibility to deliver climate implementation and providing a clear anchor for all subsequent climate policies.

4. The policy processes in climate governance are used to identify the key process in climate-energy policy-making, including agenda setting, policy formulation, and government decisions, actions, and statements. Policy processes in climate governance should emphasize accountability, transparency, and trust in government action on the transition.

5. Financial resources and investment in climate change are increasingly prominent in reducing emissions and promoting adaptation to climate change impacts. Appropriate financing for climate mitigation would be determinant in supporting countries to achieve more ambitious emissions reduction targets.

Chapter four

Methodology

4. Methodology

This study uses a mixed-method approach, where qualitative and quantitative methods are used to depict the current state of the climate-energy governance model in Indonesia. As this study is the summative part of the SNAPFI project, this study reinvestigates findings that have been collated from 2020 to 2023 (see Suroso et al., 2020; 2021; 2022a).

4.1 Data collection

The data was collected through in-depth interviews with the representatives of governments, NGOs, the private sector, academicians, and experts in the energy sector–all based or have interests in Indonesia (see Table 1). A literature review was also conducted to create a framework for the climate-energy governance model. Official statistics, reports, and news were also curated to complement the aforementioned data.

Table 1 – Interview Respondents

Respondent	Affiliation
Directorate General of Renewable Energy and Energy Conservation	Ministry of Environment and Mineral Resources
Former Senior Advisor	Ministry with a portfolio of Investment Affairs
Member	National Energy Council
Former officer	National Energy Council
Former officer	National Council for Climate Change
Political Scientist	Indonesian Institute of Science
Former Deputy	Presidential Chief of Staff Office
Public Policy Expert	
Expert in Energy Sector	National Research and Innovation Agency
Member	State Electricity Company
Member	Environmental Fund Management Agency
Vice President	Geothermal Company

Source: Author's Analysis, 2023

4.2 Data analysis

The data collected was then analysed using a set of combined quantitative and qualitative methods, including Social Network Analysis and content analysis.

4.2.1 Social Network Analysis

Social Network Analysis (SNA) was utilized to identify the clusters within the Indonesian climate-energy governance. In this report, we used several indicators to assess the situation of the governance network (see Butts, 2008).

Firstly, we developed a new network using the stakeholder mapping in our previous study (see Suroso et al., 2021). While multilevel governance does not only account for the hierarchical level of governance, i.e., national, provincial, and local levels, but also for the internal hierarchy of the institution itself, i.e., Ministry, Directorate General, Director, etc., we gave different weighting for the relationship between them. For the internal hierarchy of the institution, we gave a weight of 2 points as the upper position can delegate their job tasks to their subordinates. However, a relationship regarding coordination and/or negotiation between two institutions was weighted by 1 point. After the structure was made, the SNA was done in R using the igraph library[1].

Eigenvector centrality was assessed to identify the influence of actors within the network. Eigenvector centrality assigns a value signaling the influence of the nodes within the network, based on the concept that high eigenvector centrality means that a node is connected to many nodes who themselves have high scores, and vice versa. This study aimed to identify the community(-ies) within the Indonesian climate-governance network. Thus, several methods were used, which included:

- Edge betweenness clustering
  Also called the Girvan-Newman algorithm (Girvan and Newman, 2002), this method computes community detection by progressively deleting the links between nodes from the original network, leading to the communities which comprise the connected components of the remaining network. This method focuses on the links most likely connecting communities, also called the edge betweenness. In general, firstly the edge betweenness of the network is calculated first. This is followed by removing the edge(s) with the highest betweenness and recalculating the edge betweenness affected by removal. This step is repeated until no edges remain. The analysis result is presented in a dendrogram, where the network branches out into different communities by the removal of links of high betweenness. The smallest part of the dendrogram is individual nodes.

- Louvain method
  This heuristic method distinguishes clusters based on modularity[2] optimization and consists of two steps. The first step includes assigning every node to be in its cluster. After that, each

1 The code in this study adapts from the code made by Chanya Pumakumpol (2022), that can be accessed in https://rpubs.com/chanyap/intro_SNA

2 "Modularity is a measure of community detection which measures the strength of division of a network into communities. Networks with a high modularity have a dense connection between the nodes within modules but spread connections between nodes in different modules." (Delgado, 2022 in https://rstudio-pubs-static.s3.amazonaws.com/880092_539b86f5b8564688add51f614b864dc9.html#Detecting_Communities_with_R_Programming)

node will find the maximum positive modularity by moving to all of the neighboring clusters. If no positive gains are available, then the node will remain in its original cluster.

– Walkstrap method
This method tries to identify the clusters based on random walks. These random walks become the basis to calculate distances between nodes. Then, nodes are assigned into groups with small and large community distances via bottom-up hierarchical clustering.

Their eigenvector centrality also adjusted the size of vertices to identify the most influential actors within the network.

Apart from those listed in the glossary, the institutions analyzed using SNA will be shortened for better visualization (see Table 2).

Table 2 — Institution Acronyms

Acronym	Institutions
MoNDP	Ministry of National Development Planning
DpMANR	Deputy of Maritime Affairs and Natural Resources, MoNDP
DoE	Director of Environment, MoNDP
DoEMMR	Director of Energy, Mineral, and Mining Resources, MoNDP
DpDF	Deputy of Development Financing, MoNDP
MoEMR	Ministry of Energy and Mineral Resources
DGOG	Directorate General of Oil and Gas, MoEMR
DGREEC	Directorate General of Renewable Energy and Energy Conservation, MoEMR
DGE	Directorate General of Electricity, MoEMR
MoF	Ministry of Finance
DGFRM	Directorate General of Budget Financing and Risk Management, MoF
CfCCMFP	Center for Climate Change and Multilateral Financing Policy, MoF
FPA	Fiscal Policy Agency, MoF
FFDA	Fossil fuels developer associations
REDA	Renewable energy developer associations
MoSOE	Ministry of State-Owned Enterprises
NGC	National Gas Company
Pertamina	National energy company
SEC	National Electricity Company
IPPs	Independent power producers
CMfMIA	Coordinating Ministry for Maritime and Investment Affairs
IICA	Indonesia Investment Coordinating Agency
MoEF	Ministry of Environmental and Forestry
DGCC	Directorate General of Climate Change, MoEF

Source: Author's Analysis, 2023

4.2.2 Content Analysis

Content analysis was used to extract information from interview notes and other data such as official statistics and reports. Repetitive keywords were interpreted and then built into findings, followed by the conclusion of the study. Keywords used in this study are, although not limited to, climate-energy governance model, energy policy-making, key actors/institutions in climate-energy governance, renewable energy development, coal sector, just energy transition, climate-energy policies, political window, role of private sector, government's commitment in energy transition, politically exposed persons (PEPs), transparency and accountability mechanisms, lobbying and negotiating process, informality practices, renewable energy financing, renewable energy investment, international funding and domestic funding, and innovative financing.

Chapter five

Indonesia Energy Outlook 2023

5. Indonesia Energy Outlook 2023

5.1 Energy Policy Landscape

Decision 1/CMA.3 encourages parties to revisit and strengthen the NDC target to align with the 1.5°C Paris Agreement by the end of 2022. After submitting the Updated NDC in 2021, Indonesia also submitted the Enhanced NDC to the UNFCCC Secretariat by 2022. In the Enhanced NDC, the emission reduction target increased from 29% to 31.89% unconditionally (with its resources) and from 41% to 43.20% conditionally (with international support). In the unconditional emission reduction target, the commitment in the energy sector will be implemented through energy conservation and the promotion of clean and renewable energy sources. In addition, Indonesia can increase its contribution up to 43.20% emission reduction conditionally, subject to the availability of international support for finance, technology transfer and development, and capacity building (Republic of Indonesia, 2022). The Enhanced NDC will be aligned with the LTS-LCCR 2050 with a vision to achieve net zero emission by 2060 or sooner.

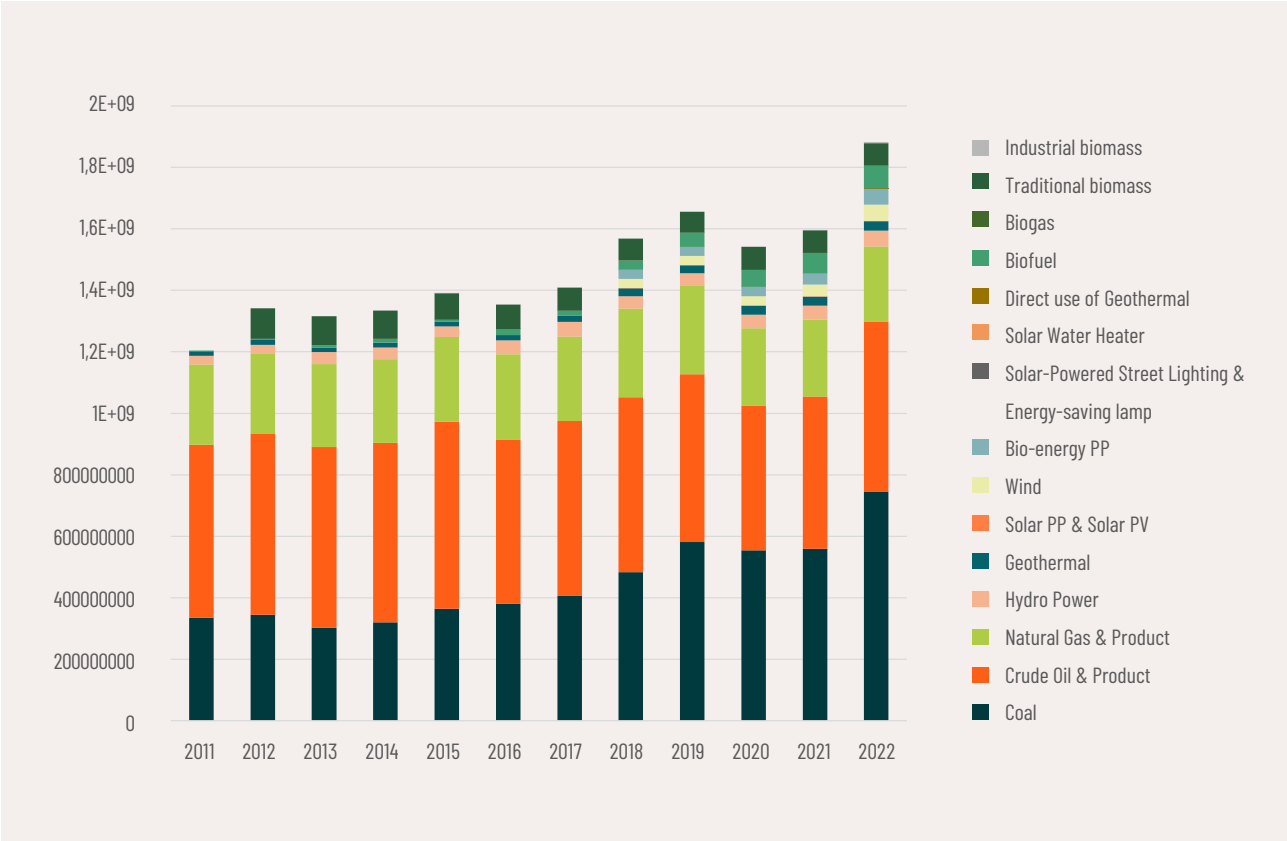
Besides Enhanced NDC and LTS-LCCR 2050 as an international commitment to climate change, the Indonesian energy sector also has a different policy trajectory, such as the National Energy Policy-KEN (2014), the National Energy General Plan-RUEN (2017), the Electricity Supply Business Plan-RUPTL (2021-2030), the National Electricity General Plan-RUKN (2019-2038), the National Energy Grand Strategy, the Presidential Regulation No.98/2021 on Carbon Economic Value, and the Presidential Regulation No. 112/2022 on the Acceleration of Renewable Energy Development for Power Supply. However, several energy-related policies still incorporate a high proportion of coal in energy mix projection, making it difficult to achieve the 23% renewable energy target by 2030 or 31% by 2050. RUEN (2017), for instance, although the share of coal is modelled to decrease up to 2050, the primary energy supply from coal consistently increases. In RUPTL 2019-2030, the Indonesian energy mix will also be dominated by coal in 2030. In the Indonesian law hierarchy, RUEN is operationalized by Regional Energy General Plan (RUED). According to IESR (2022), RUED still shows unambitious targets. Thus, the regional government needs to enhance its targets and allocate financial resources to accelerate the energy transition.

5.2 Primary Energy Supply

Based on data from 2011 trends, the growth of non-renewable energy share has continued to increase annually, with a higher growth rate than renewable energy. According to MoEMR (2022), the primary energy supply increased significantly by 17% compared 2021 to 1,831,619,126 BOE in 2022. By history from 2011-2022, the primary energy supply by sources is still dominated by coal and crude oil and products. The energy supply from coal increased significantly by 33% from 2021 to 745,721,066 BoE in 2022. Crude oil and products also increased by 11% from 2021 to 552,469,086 BOE in 2022. Meanwhile, the growth of renewable energy share in the primary energy mix has continued to increase, albeit with slow annual growth (IESR, 2022). For instance, the energy supply from geothermal only increased by

5% from 2021 to 30.978.688 BOE in 2022. The following is a description of the primary energy supply from 2011-2022 in Figure 3.

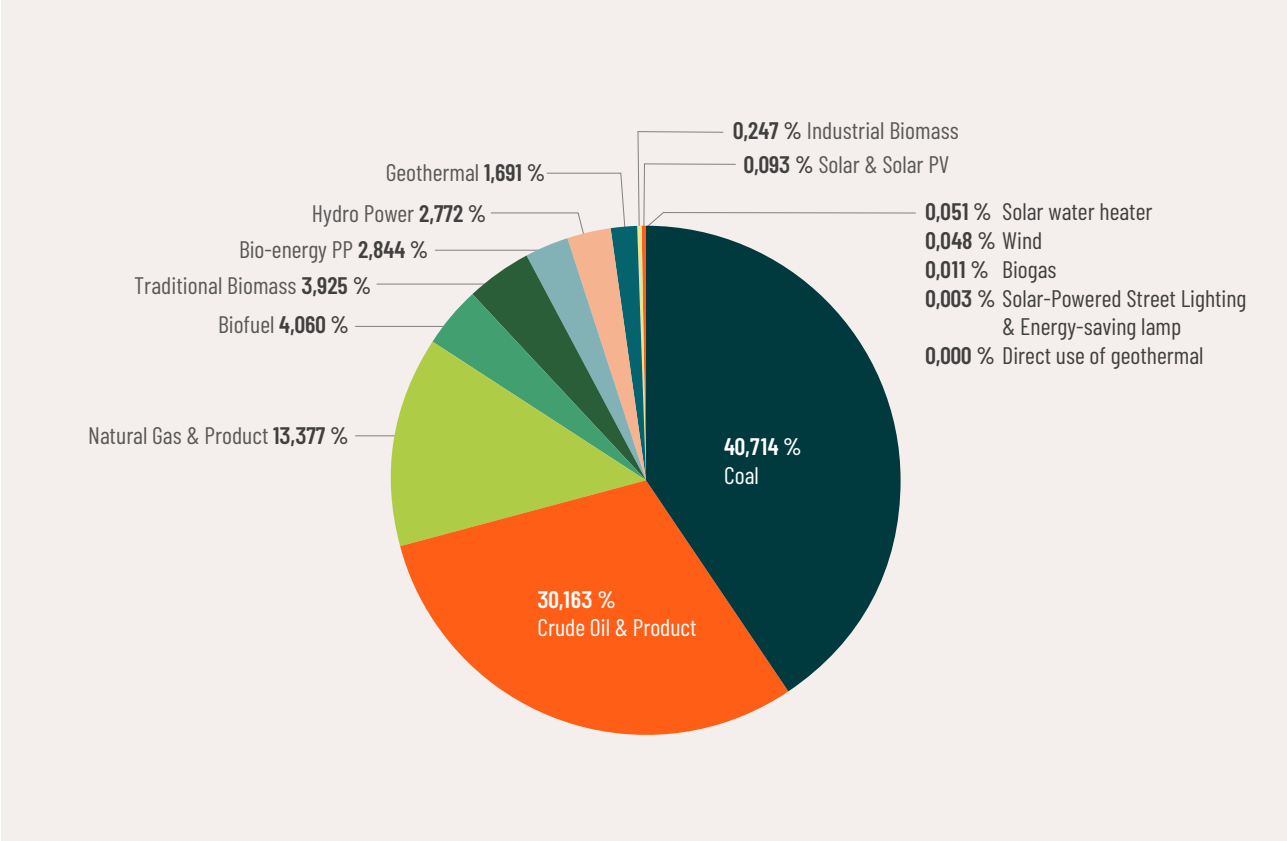
Figure 3 – Primary Energy Supply 2011-2022 (BOE)



Source: MoEMR, 2022

Renewable energy share in the Indonesian primary energy mix has declined from 11.5% in 2021 to 10.4% in 2022 (IESR, 2022). Figure 4 shows that the primary energy supply in 2022 is still dominated by coal at 40,71%, followed by crude oil and products at 30,16%. Meanwhile, biomass and biofuel contributed 8.24 % for renewable energy, followed by hydropower 2.77 %, geothermal 1.69 %, wind 0.048 %, and solar PV 0.093 %. The increase in coal share to an all-time high of 40% makes the 23% renewable energy target by 2025 seem even more unattainable. The following is a description of the primary energy supply for 2022 in Figure 4.

Figure 4 — Primary Energy Supply 2022 (BOE)



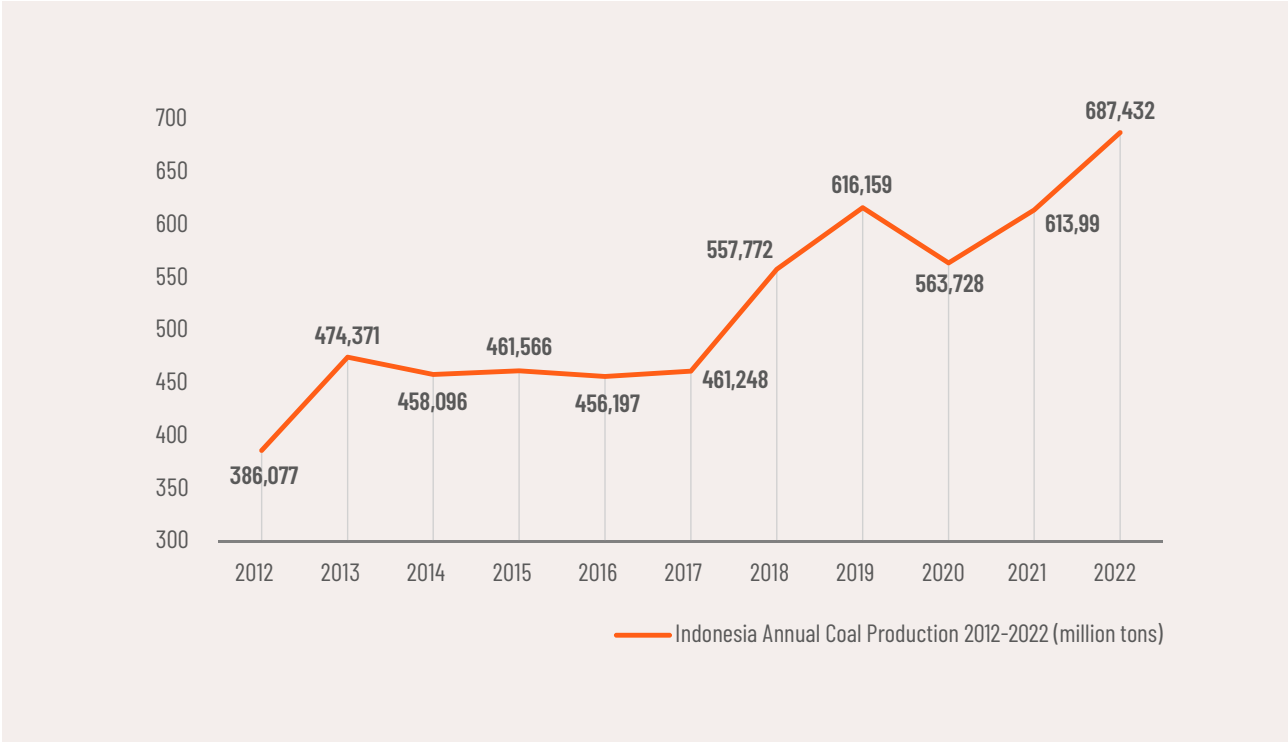
Source: MEMR, 2022

One of the largest energy sources in Indonesia comes from coal, making Indonesia still reluctant to move away from coal. According to the Long-Term Development Plan (RPJP) 2005-2025, coal is favoured as one of the important energy sources in Indonesia. Based on the electricity cost, coal is also considerably cheaper and abundant in reserves and resources (Arinaldo and Adiatma, 2019; The Purnomo Yusgiantoro Center Research Team, 2019). The growth of the coal industry in Indonesia simultaneously positively impacts labour absorption. Moreover, the coal industry in Indonesia also contributes significantly to regional development as it is a major source of revenue at the provincial and district levels (Arinaldo and Adiatma, 2019). This condition creates a dilemma in the Indonesian energy sector. The dilemma is therefore choosing either affordable energy cost or less pollution to the environment.

Indonesia is one of the largest coal producers in the world. According to MoEMR, coal production in 2022 reached 687 million tons (103% of the target of 663 billion tons), this number also increased by 12% compared to 2021's achievement of 614 million tons (see Figure 5). With high coal production and high demand on a global scale at more attractive prices, Indonesian coal companies prefer exporting their products to sell to the domestic market (IESR, 2022). According to MoEMR (2022), coal export trends have increased in the last three years despite a decline in 2020 during the pandemic. In 2022, coal exports increased by 7% to 465 tons, the highest achievement since 2012 (see Figure 6). In the first quarter of 2023, Indonesia's coal production reached 170.2 million tons, with total sales reaching 154.19 million tons. Of this amount, 122.84 million tons were for the export market, and the remaining

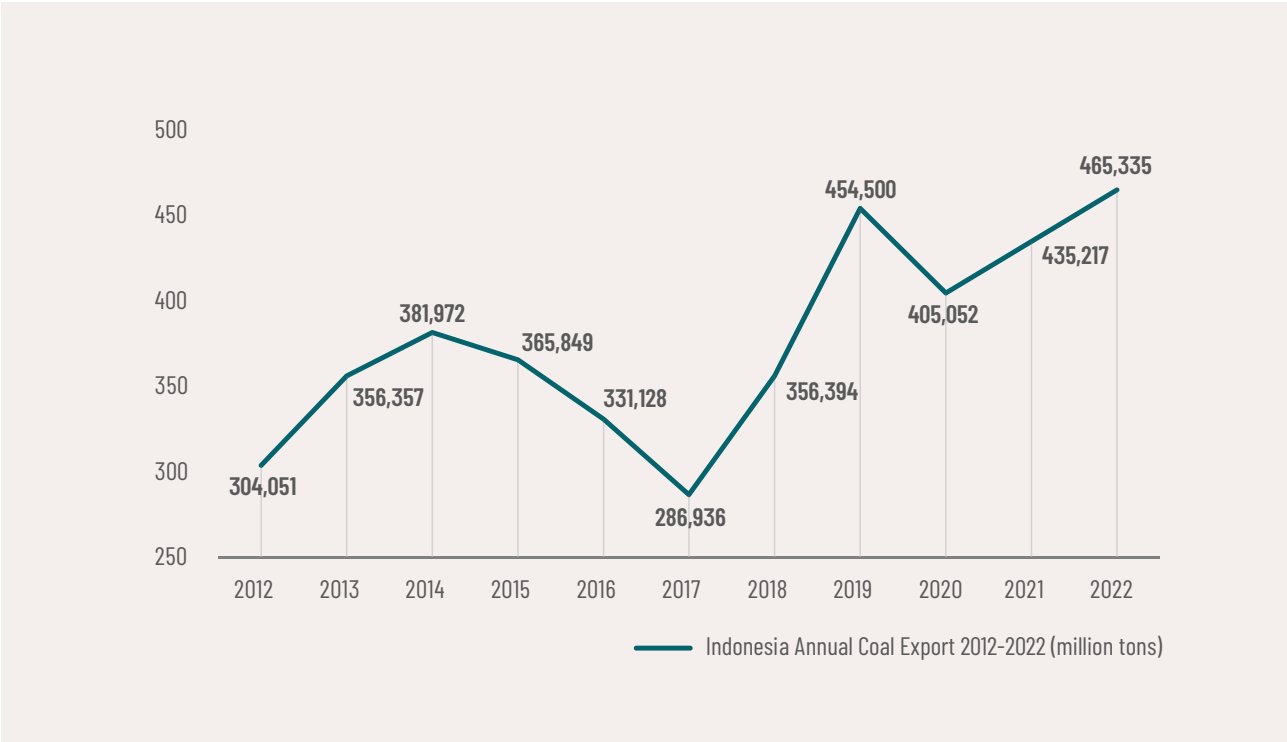
31.35 million tons were to fulfil the Domestic Market Obligation (DMO). Indonesia is an important country in the global mining industry and one of the main coal suppliers to Asian countries. The main destination countries for Indonesian coal exports include India, China, Japan, Philippines, Malaysia, Taiwan, South Korea, Thailand, Vietnam, and Hong Kong (Statistic Indonesia, 2022). Based on data from the Handbook of Energy and Economic Statistics of Indonesia 2020 (MoEMR, 2020), Indonesia exported 26.97 million tons to Japan in 2020. This is the third largest after exports to China at 127.79 million tons and India at 97.51 million tons. The high demand for coal from importing countries such as Japan, China, and South Korea and soaring coal prices in the global market have encouraged the coal Industry rather to export their products (IESR, 2022).

Figure 5 – Indonesia Annual Coal Production 2012-2022 (million tons)



Source: MoEMR, 2022

Figure 6 — Indonesia Annual Coal Export 2012-2022 (million tons)



Source: MoEMR, 2022

The number of coal mining businesses has expanded into the renewable energy development business to reduce carbon emissions in the mining and energy sector. According to IESR (2022), fossil fuel companies increasingly show a strong appetite to diversify their portfolios towards green businesses. Table 3 shows some fossil fuel companies that have started diversifying their business towards low-carbon. The companies have set their emissions targets, core activities to reduce emissions, and incorporate more renewable energy development into their business portfolio.

Table 3 — Transition Strategy of Fossil Fuel Companies

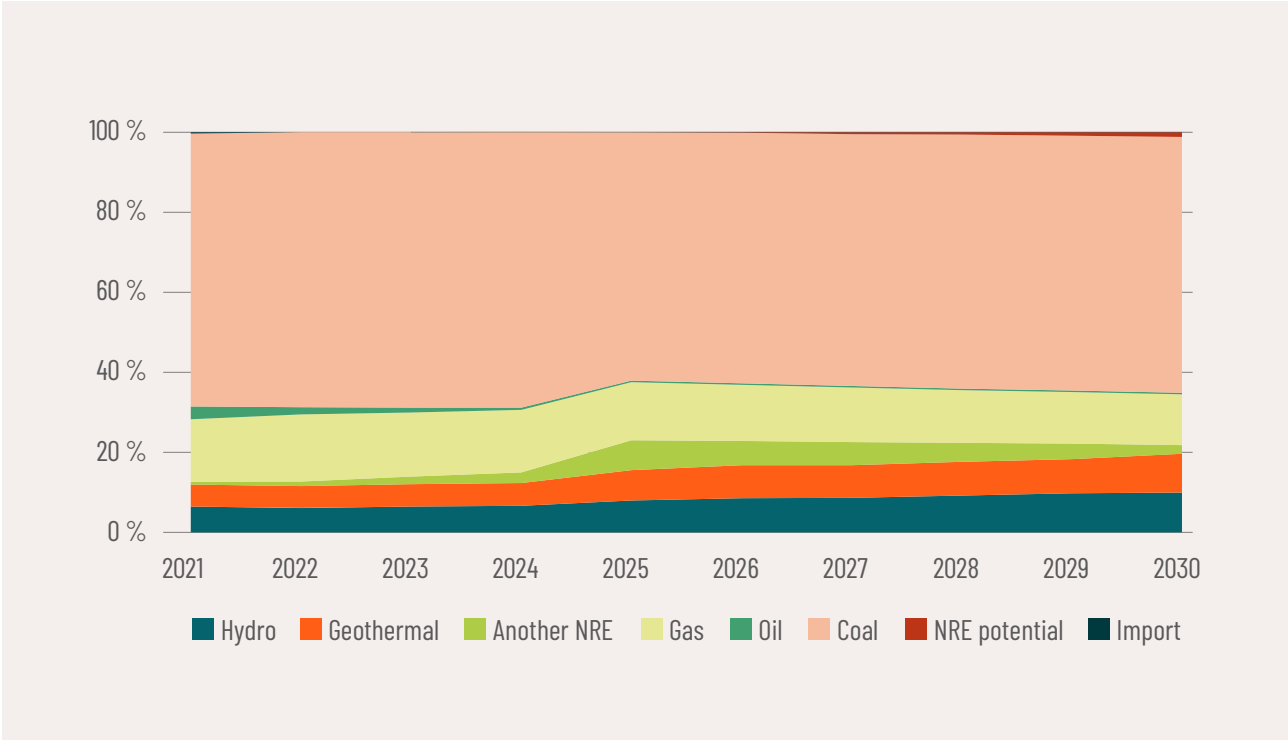
No	Company	Business Diversification Strategy	Current Green Business
1	Medco Energi Internasional	Subsidiary	Geothermal and solar PV power generations
2	Bukit Asam	Subsidiary	Solar PV powergeneration
3	Pertamina Indonesia	Subsidiary	Geothermal steam, solar PV, biogas and geothermal power generations
4	Indika Energy	Subsidiary, Joint-Venture	Solar PV power generation, biomass production, two-wheelers EV
5	TBS Energi Utama	Acquisition, Subsidiary, Joint-Venture	Hydro and wind power generation, two-wheelers EV
6	Mitrabara Adiperdana	Subsidiary, Joint-Venture	Biomass and solar PV power generation
7	United Tractor	Acquisition, Subsidiary	Hydropower generation
8	Indo Tambangraya Megah	Subsidiary	Rooftop Solar PV

Sources: IESR, 2022

5.3 Power Generation

Despite contributing around 40% of the total emission, renewable energy share has not significantly increased in Indonesian power generation, as the renewable capacity additions in 2022 are also limited (IESR, 2022). In 2022, coal dominated the power generation mix by contributing 67,5%, while renewable energy share only contributed around 12.8%. In the RUPTL 2021-2030 projection, coal-fired generation is still the largest contributor to the power generation share. National coal power generation is projected to continue to grow from 194,558 GWh in 2021 to 264,260 GWh in 2030. Due to the dominance of coal, power plants account for more than 40% of total emissions in the energy sector. Figure 7 describes the Indonesian electric energy mix 2021-2030.

Figure 7 — Indonesian Electric Energy Mix 2021-2030 (Gwh)



Source: RUPTL 2021-2030

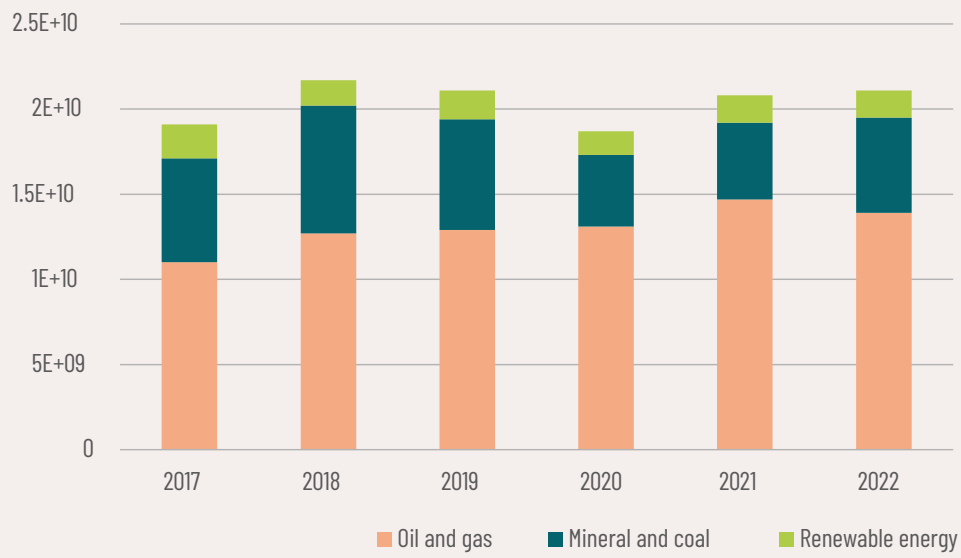
5.4 Renewable Energy Investment

Financing in climate change is essential to enabling climate action and helps countries reduce GHG emissions. Sovacool et al. (2015) stated that the effectiveness of climate finance mechanisms in supporting low-carbon development would depend on the capacity of national institutions to prioritize effectively and ensure that the distribution of costs and benefits does not amplify vulnerabilities. Besides the capacity of national institutions, adequate policies and the role of actors are also needed in the transition to low-carbon development (Setyowati and Quist, 2022). Effective public policies provide a broader space for public participation and are the main driver of private finance flow for renewable energy development (Setyowati & Quist, 2022; Rodriguez et al., 2015).

In the renewable energy sector, to meet the targets set in the RUEN 2017, investment in renewable energy is projected to be greater than investment in fossil fuels. However, there is a gap between renewable and fossil fuels investments. Renewable energy investment in Indonesia is significantly lower than fossil fuel investment, making the 23% renewable energy target difficult to achieve (Hendriwardani et al., 2022). Fossil fuel still attracted the largest share of investment in 2021 at USD 19,2 billion (around 92% of the total investment in the energy sector. While investment in renewable energy was only USD 1,6 billion, representing 8% of the total investment in the energy sector. In 2022, fossil fuel investment reached USD 19,5 billion (higher than in 2021), while investment in renewable energy is still USD 1,6 billion (see Figure 8). According to IESR (2022), investment in renewable energy failed to meet the targets in 2022, only 40% of the target of USD 3,97 billion. With high coal prices, the coal and mineral mining sector managed to come close to the target, reaching 80% in the third quarter.

The main barriers to underinvestment in renewable energy development in the Indonesian energy sector come from the planning and implementation aspects (Yudha et al., 2021). The main challenges in renewable energy development that make it difficult to attract investors include: renewable energy development has high risk and low returns; renewable energy policy is not yet supportive of creating an attractive market, for instance, uncertainty in pricing policy; renewable energy policies are fragmented and changing; most renewable energy projects take time to develop due to bureaucratic challenges especially the process of permit issues; the Government's inability to comprehensively understand the factors required to encourage private sector investment in the renewable energy; and the lack of transparency and accuracy of data on financial flows, sources and allocation of public funding for renewable energy projects (Maulidia, 2019; Maulidia et al., 2019; Asian Development Bank, 2019; Lestari, 2021; OECD, 2021).

Figure 8 — Investment Allocation in Energy Sector (2017-2022)



Source: MoEMR, 2023

5.5 Key takeaways

1. In the climate policy landscape, Indonesia has enacted several energy-related policies such as the National Energy Policy (KEN), the National Energy General Plan (RUEN), the Electricity Supply Business Plan (RUPTL), the National Electricity General Plan (RUKN), the National Energy Grand Strategy, the Presidential Regulation No.98/2021, and the Presidential Regulation No. 112/2022. However, several energy-related policies still incorporate a high proportion of coal in energy mix projection, making it difficult to achieve the 23% renewable energy target by 2030 or 31% by 2050.

2. Based on trend data from 2011-2022, the primary energy supply in Indonesia is still dominated by coal and crude oil products. In 2022, renewable energy share in the Indonesian primary energy mix has declined from 11.5% in 2021 to 10.4%. The increase in coal share to an all-time high of 40% in 2022 makes the 23% renewable energy target by 2025 seem even more unattainable.

3. Indonesia is one of the largest coal producers in the world. With high coal production and high demand on a global scale at more attractive prices, Indonesian coal companies prefer exporting their products to sell to the domestic market. In 2022, coal exports increased by 7% to 465 tons, the highest achievement since 2012. High coal exports are partly driven by more favourable global market prices.

4. To support carbon emission reduction, a number of fossil fuel companies in Indonesia have started diversifying their business towards low-carbon. The companies have set emissions targets, core activities to reduce emissions and incorporate more renewable energy development into the business portfolio.

5. Renewable energy share has not significantly increased in Indonesian power generation. In 2022, coal dominated the power generation mix by contributing 67,5%, while renewable energy share only contributed around 12.8%. Also, in the RUPTL 2021-2030 projection, coal-fired generation is still the largest contributor to the power generation share.

6. There is a gap between renewable and fossil fuels investments. Fossil fuel still attracted the largest share of investment in 2022 at USD 19,5 billion, while investment in renewable energy was only USD 1,6 billion. Renewable energy investment failed to meet the targets in 2022, only the coal and mineral mining sector managed to come close to the target. The most significant barriers to renewable energy investment come from the planning and implementation aspects.

Chapter six

Analysis and Discussion

6. Analysis and Discussion

In this section, the climate-energy governance model will be elaborated by four components of the governance framework: key actors/institutions, key policies, policy processes, and financing.

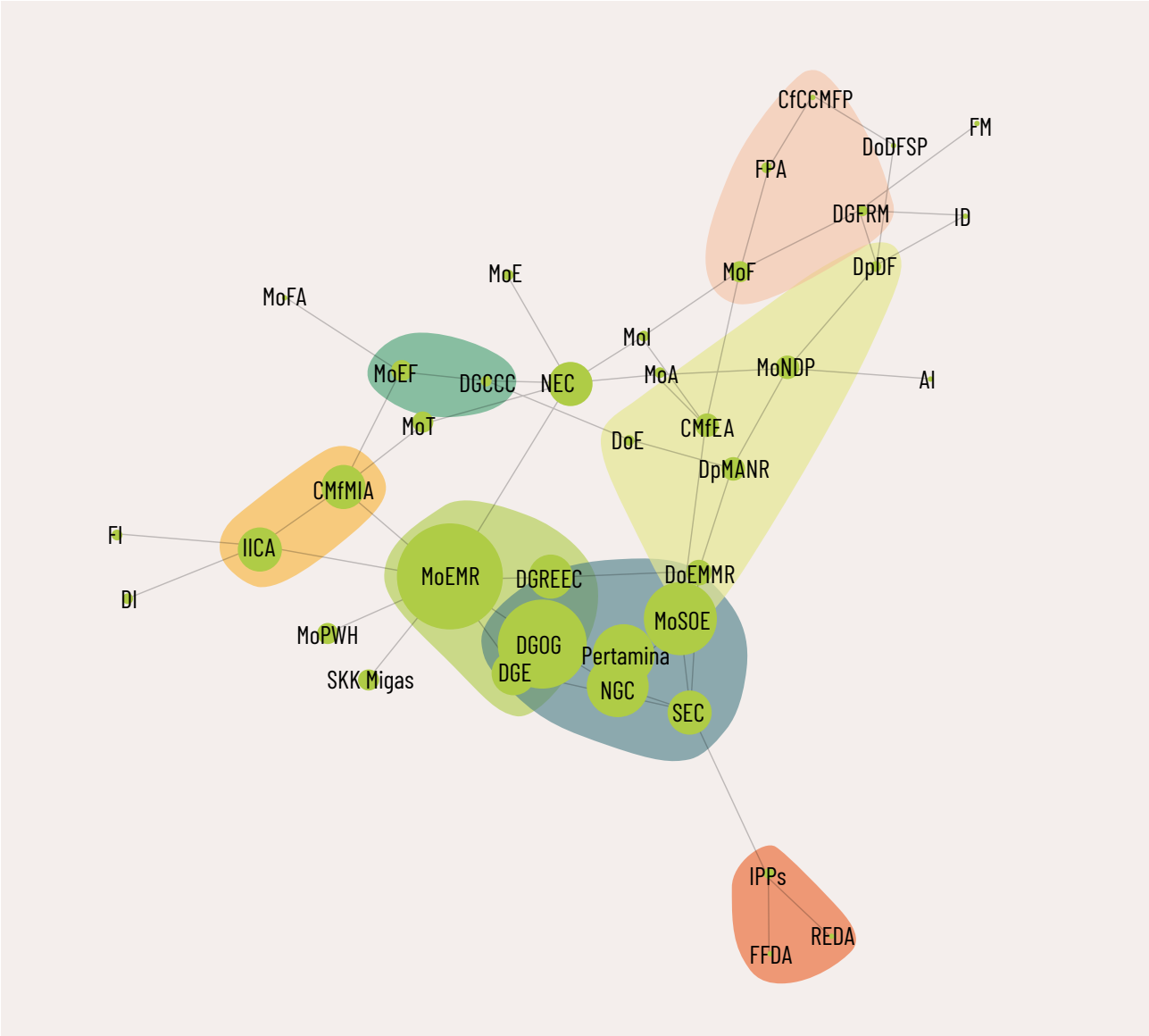
6.1 Key Actors/Institutions

From our previous study (see Suroso et al., 2020; Suroso et al., 2021), actors involved in Indonesian climate-energy governance can be divided into two groups. The first group consists of the Ministry of National Development Planning (MoNDP), the Ministry of Environment and Forestry (MoEF), the Ministry of Energy and Mineral Resources (MoEMR), the Ministry of State-Owned Enterprises (MoSOE), the Ministry of Finance (MoF), the Ministry of Industri (MoI), the Coordinating Ministry for Economic Affairs (CMfEA), and the Coordinating Ministry for Maritime and Investment Affairs (CMfMIA). And the second group consists of state-owned enterprises (such as State Electricity Company (SEC), Pertamina, and National Gas Company (NGC)), renewable energy enterprises, Independent Power Producers (IPPs), Non-Governmental Organisations (NGOs), and funding managers or banks. In climate-energy governance, MoEMR and MoEF are the most powerful actors in the energy sector. Other actors that can be identified in the energy sector are the National Energy Council (NEC) and the State Electricity Company (SEC).

Reproducing the stakeholder mapping we did in our previous study, we built a network of actors within the Indonesian climate-energy governance (see Figure 9). Although previously we classified these actors into four main functions of climate-related governance: climate change policy-making, energy policy-making, climate financing, and general policymaking, more clusters emerged from our analysis. Firstly, using a dendrogram based on edge betweenness, seven clusters represent different functions within the Indonesian climate-governance network (see Figure 10). Three clusters represent three ministries: MoNDP, MoEF, and MoF, where the cluster's members are units within each ministry (see also Table 4). Apart from these clusters, there are other communities such as the Coordinating Ministry for Maritime and Investment Affairs (CMfMIA)- the Indonesia Investment Coordinating Agency (IICA) Cluster, which represents the gateway towards foreign and domestic investments in Indonesia, and the Independent Power Producers (IPPs)-Fossil fuels developer associations (FFDA)- Renewable energy developer associations (REDA) Cluster, which signifies the independent power producers which are influenced by the proponents of either fossil fuels or renewable energy.

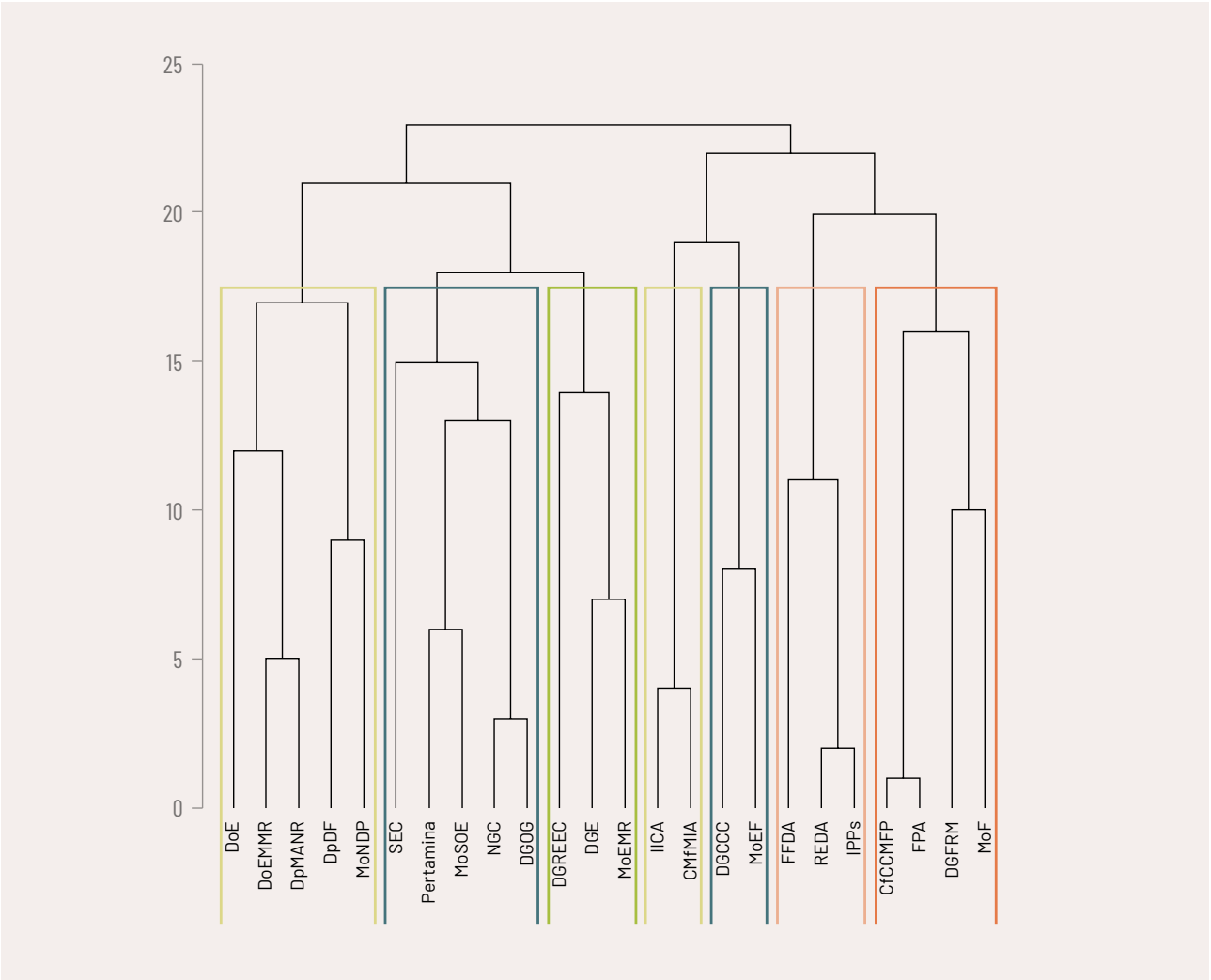
An interesting finding is the clusters related to energy policy-making. Here MoEMR is the leading institution, having the Directorate General of Electricity (DGE), Directorate General of Renewable Energy and Energy Conservation (DGREEC), and Directorate General of Oil and Gas (DGOG) as its operating units. However, DGOG is not in the same cluster as MoEMR; rather it falls into another cluster consisting of the Ministry of State-Owned Enterprises (MoSOE), State Electricity Company (SEC), Pertamina, and National Gas Company (NGC). This cluster is indeed evidence that moderating the energy demand while creating climate-related energy policies is a hard task of the MoEMR. A similar situation also happens in another cluster, where the agenda contestation occurs between fossil fuels and renewable energy development associations.

Figure 9 — Communities within the Indonesian Climate-Energy Governance Network



Source: Author's Analysis, 2023

Figure 10 — A Dendrogram of Indonesian Climate-Energy Governance Network



Source: Author's Analysis, 2023

Table 4 — Memberships of Cluster within Climate-Energy Governance Network

Clusters	Memberships
1	MoNDP, DpDF, DpMANR, DoE, DoEMMR
2	MoF, FPA, DGFRM, CfCCMFP
3	MoSOE, DGOG, NGC, Pertamina, SEC
4	MoEMR, DGREEC, DGE
5	IPPs, FFDA, REDA
6	CMfMIA, IICA
7	MoEF, DGCCC

Sources: Author's Analysis, 2023

Furthermore, when we delve into the influence of each actor within the network–represented by the eigenvector centrality (see Figure 9), the results are also consistent with our previous study. Firstly, the size of nodes–adjusted to the eigenvector centrality–intuitively suggests that MoEMR is the biggest influencer within the network (see Appendix 2 for further information). MoEMR's units, i.e., DGOG, DGREEC, and DGE, are also among those who have the highest eigenvector centrality. It is surprising that MoSOE also has a relatively high centrality, which implies the duality of SEC of not only being the one responsible for electricity production, transmission, and distribution but also a state-owned company aiming for profits. SEC becomes a central actor in the electricity sector and is dominant in electricity generation, transmission and distribution, energy transition, and climate finance mobilization. In the transmission and distribution of electricity, SEC collaborates with several IPPs to fulfil the electricity demand in Indonesia. Being a State-owned enterprise (SOE), SEC plays an important role in purchasing electricity from big and small IPPs and selling it to customers. To meet long-term electricity demand, SEC formulates the RUPTL document as guidelines for the development of the power system for the next ten years. On the other hand, SEC also coordinates with the Directorate of Electricity of the MoEMR. Through the MoEMR, the government is increasing the portion of renewable energy-based power plants, as outlined in the 2021-2030 RUPTL. To accelerate the energy transition, SEC and MoEMR also increased human resources capacity in the renewable energy sector. SEC's commitment to energy transition is shown by implementing green projects through various funding sources, including the Just Energy Transition Partnership (JETP)[3] in 2022. Through the JETP funding scheme, SEC mapped 522 green energy projects with a total capacity of up to 15.1 gigawatts (GW) until 2030 to be included in the Comprehensive Investment and Policy Plan (CIPP) in the JETP scheme (Syofiadi, 2023).

The cluster of CMfMIA-IICA is also connected to MoEMR's cluster, which shows the direct potential for investment in the Indonesian energy sector. However, this function seemingly is not directly connected with the cluster of MoF as the pertinent ministry, although more data is needed to elaborate on this more. A similar pattern also manifests in the cluster of MoEF, as it is not directly linked with the MoEMR's. Rather, NEC, MoNDP, and CMfMIA become the intermediaries. This finding signals the sectoral interests that do not only persist and perpetuate the energy trilemma but also will keep overpowering the efforts to just transition towards 2060. In particular, Figure 9 also suggests that NEC is an intermediary of many important actors but is not included in any clusters.

6.2 Key Policies

Responding to the NDC target, the Government of Indonesia has drafted the NDC implementation strategy, including the planning stage, implementation, monitoring, and evaluation, and review to support the achievement of national goals. Indonesia has set the NDC target of 31.89% with its resources and 43,20% if the nation is assisted by international support. Tracking the policy trajectory from our previous study (see Suroso et al., 2021), the fundamental policy related to the energy sector is Law 30/2007. Other policies can be identified in the energy sector, such as KEN (Kebijakan Energy Nasional/ National Energy Policy), RUEN (Rencana Umum Energi Nasional/ National Energy General Plan), RUPTL (Rencana Usaha Penyediaan Tenaga Listrik/ Electricity Supply Business Plan), and the

3 The JETP is an agreement to mobilize an initial $20 billion in public and private financing to decarbonize Indonesia's energy sector, using a mix of grants, concessional loans, market-rate loans, guarantees, and private investments. Retrieved from: https://web.pln.co.id/pln-jetp/jetp-home

Grand Strategy of National Energy. The previous study also found a gap between the government's pledge to NDC, national policies, and programs to achieve it. The energy-related policies are seen as a setback toward the national renewable energy target by still allowing the use of coal than renewables.

As regulations signal the government's will to implement certain policies, however, we found that consistency, or in other words, commitment remains highly crucial in maintaining order for the energy regime to do a just transition. Just transition in the energy sector is important as a tool to analyse energy policy related to energy trilemma[4] and injustices in energy planning (Heffron et al., 2015; Jenkins et al., 2017). According to Maulidia et al. (2019) for longer-term considerations, the energy justice concept provides a broader socio-economic framework for analysing energy policies suitable for Indonesia. Following our first-year study (Suroso et al. 2020), the climate-energy policy trajectory shows that key policies indeed are bound to the administration term (see Figure 11). The pledge of NDC and the goal of NZE 2060 were all set in President Joko Widodo's administration. Several vital regulations were also enacted, particularly the Carbon Economic Value Policy and Acceleration for Renewable Energy Development for Electricity Supply Policy, which exemplify the will toward just transition. However, the carbon market is still not enacted in Indonesia as the regulation is still synchronised with other tax-related policies. Furthermore, other supporting policies are required and not yet enacted, such as the New Renewable Energy Act and feed-in tariff policy. This situation will put the GoI's political commitment following the international climate pledges at stake, particularly emphasised greatly by the upcoming Presidential election 2024. In Indonesia, a political will or political window is an opportunity to enact and publish certain policies. The Presidential election in 2024 as a policy window requires a solid negotiation to continue or even improve the commitment to supporting the climate pledges. As previously mentioned, the contestation of fossil fuel vis-a-vis renewable energy is persisting, particularly in the current rise of solar PV and electric vehicles.

However, from our third-year study (Suroso et al., 2022a), the roles of the private sector should also be accommodated by designing pertinent policies to improve the situation, i.e., just transition. These roles include policy entrepreneur, advocate, financier, and R&D contributor. More practical actions to show GoI's commitment are also needed to improve these private sector roles. For example, regarding the technology development roadmap or RIPIN (Rencana Induk Pembangunan Industri Nasional/ National Industry Development Master Plan) 2010-2035, the document is not referred to in any other energy policies. As the current landscape in which many companies pivot into renewable energy development, an innovation system which enables knowledge transfer should also be maintained by GoI. From the same study, an urgent task is also bureaucratic restructuring (Suroso et al. 2022a), as many policies are considerably still favouring the fossil fuel industries over renewable energy. Although this policy will not be popular, the effects will rather solidify the pathway towards just transition. To make renewable energy more affordable and support the creation of an attractive market for investors, the right mix of policy instruments is needed, such as incentive policies and business-friendly policies (no value-added tax on clear electricity sales and an easy licensing process).

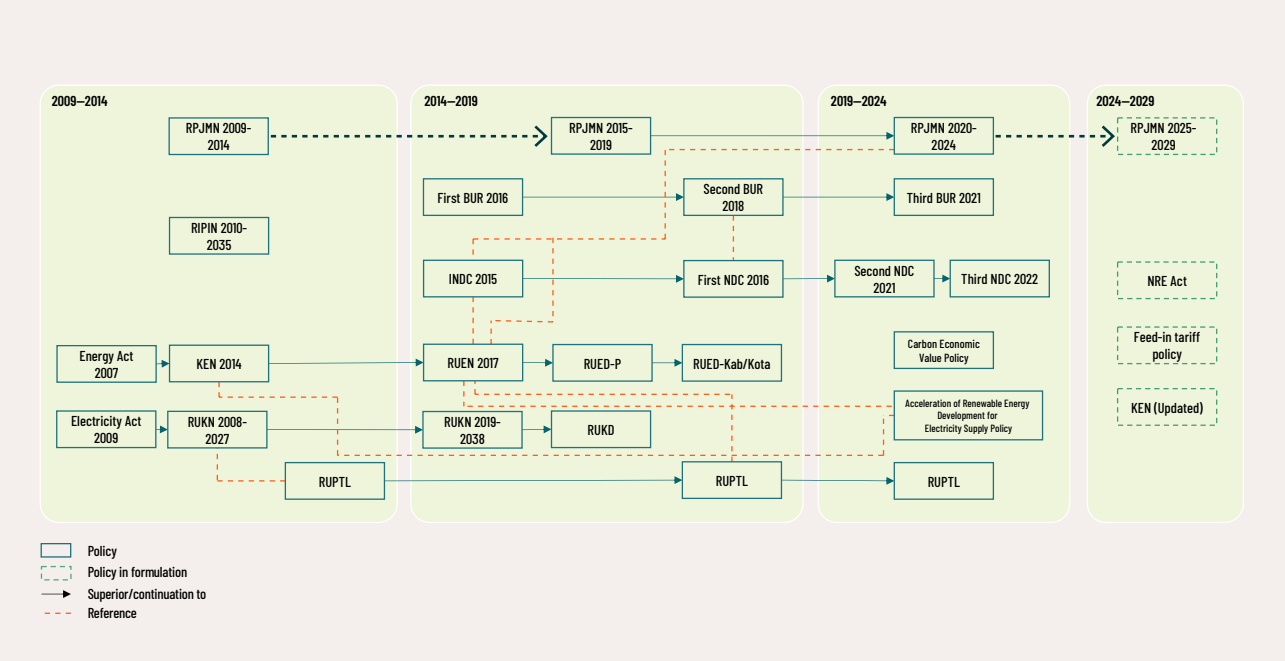
Another policy window can also emerge since KEN 2014 is going to be updated[5]. As the issue of just transition in Indonesia rose after KEN was enacted in 2014, the update should also address how to make the energy transition become just, leading to reaching NZE by 2060. As KEN is the highest-

4 Energy trilemma here is conceptualised in the Indonesian context, which the difficulties in achieving energy sovereignty (the capacity of Indonesia to meet the energy demand), energy affordability (ensuring high access for citizens to energy), and energy sustainability (maintaining low impacts to the environments).

5 Interview with a respondent from NEC. See Suroso et al. (2022a) for further reference.

level energy policy, it is imperative for the GoI to update other regulations connected to KEN. Just transition in the energy sector needs to emphasize policies that encourage the democratization of energy, where communities can meet their own energy needs through community-owned power plants[6]. On the other hand, energy justice also needs to emphasize adjustments to policies or technical standards, including financing for the development of each type of power generation capacity. At the core, the energy transition must be truly for energy sovereignty and the people.

Figure 11 — Climate-energy policy trajectory by the presidential administration



Sources: Author's Analysis, 2023

6 Interview with a respondent from Expert in Energy Sector of NRIA.

6.3 Policy Processes

Indonesia's commitment to climate change began in June 1992 by ratifying the UNFCCC, followed by ratifying the Kyoto Protocol in 2004 through Law 17/2004. After that, Indonesia also demonstrated its important role in contributing to global efforts in climate change through the Thirteenth Conference of the Parties (COP13) of the UNFCCC in 2007, which produced The Bali Action Plan. Under the presidency of Susilo Bambang Yudhoyono (SBY), the GoI pledged to reduce emissions by 26% using its resources and up to 41% with international support from business as usual by 2020.

Concerning Indonesian climate governance, big changes occurred in 2014 during the presidency of Joko Widodo (Jokowi). Indonesia's commitment to reducing emissions was strengthened by ratifying the Paris Agreement in 2016. Under the Paris Agreement, the GoI pledged to reduce emissions by 29% (unconditionally) and up to 41% (conditionally) from BAU by 2030 (Republic of Indonesia, 2016). However, the 29% target is only an adjustment to the consequence of the trend of BAU emissions from 2010 to 2020 that is extrapolated to 2030 (Suroso et al., 2021). Indicated that there is no additional commitment in Indonesia's NDC. Then, the GoI submitted an updated NDC and compiled the LTS-LCCR 2050 in November 2021. The updated NDC did not change its GHG emissions reduction targets. Related to NZE, Indonesia shows optimism about reaching the peak of national GHG emissions in 2030 with a net sink in forestry and land uses (FOLU) and towards net zero emissions in 2060 or sooner (Republic of Indonesia, 2021). According to interview results with the Member of NEC, the NZE target in 2060 or sooner in the LTS-LCCR will be challenging because energy supply and demand still rely on coal until 2050. IESR (2021) also stated that the LTS-LCCR's low-carbon scenario still incorporates a high portion of fossil fuels, and CCUS technology is expected to become more expensive. Thus, the LTS-LCCR is considered unable to demonstrate Indonesia's strong commitment to achieving NZE. In 2022, the GoI delivered its increasing ambition to reduce GHG emissions through Indonesia's Enhanced NDC (ENDC) document to the UNFCCC. Climate mitigation targets with its resources of 29% increased to 31.89%, while with international support of 41% increased to 43,20% at ENDC (Republic of Indonesia, 2022). Nevertheless, the ENDC still permits coal use by at least 25% in 2050. This policy further clarifies the government's tendency to extend the operational period of coal and divert Indonesia from energy transition (Greenpeace, 2022). Climate Action Tracker (2022) also rates Indonesia's climate targets and policies as "highly insufficient," indicating that Indonesia's climate commitments lead to rising rather than falling emissions and are inconsistent with the Paris Agreement.

While President Jokowi showed some commitment to act against climate change on the international stage, the government's commitment and policy under Jokowi's administration do not support the president's commitment, as indicated by the rolling back of existing climate policies. The transition to net zero emissions is not sufficiently considered by the relevant ministries and current policies, such as the palm oil industry's policies that further encourage deforestation. The first-year study (see Suroso et al., 2020) also shows that the first-tier policies (national bill/law) were translated differently at the second and third-tier policies (ministerial level policies) and sometimes overlapped with each other. This condition signifies a lack of political commitment, accountability, and trustworthiness for transition-related policies toward net zero emissions.

The presidential system, accompanied by a multi-party system and coalition in each party, has made Jokowi's current administration ineffective and unstable (Akhbar et al., 2020). The number of party

coalitions prioritizing party elites' interests over the public interest has weakened Jokowi's power and reduced government accountability (Power, 2018). In Indonesian climate governance, political parties and business interests also colour the energy sector, as energy is closely related to the national economy[7]. Considerably weak presidential leadership had encouraged the involvement of political and business interests in energy policy-making[8]. Our previous study identifies the involvement of politically exposed persons (PEPs) from the coal sector in climate governance, especially in the energy sector, through an oligarchical process. Oligarchies in political institutions have the potential to lead to informal practices in climate governance, indicated by the abuse of power to exploit loopholes in the policy-making process[9].

From our previous study (see Suroso et al., 2020; Suroso et al., 2021), it is found that, although the procedure and mechanism of policy-making are clear, informal practices between actors such as lobbying still colour the process of promulgating certain regulations and policies. Due to the lack of transparency and accountability mechanisms, the involvement of PEPs from the coal sector has facilitated back-stage practices such as lobbying and negotiating in energy policy-making[10]. The lobbying and negotiating process in energy policy-making frequently occurs between PEPs from the coal sector and MoEMR as well as CMfMIA, allowing the PEPs to sway policies to reflect their interest easily. The presence of PEPs within Indonesian climate governance strongly influences energy policy-making, for instance, the Mineral and Coal Mining Law and the coal export ban policy. The discussion of these two policies was closed and rushed. Mineral and Coal Mining Act tends to benefit because one of its policies is related to the extension of coal company contracts for those whose contracts will expire. Related to the coal export ban policy, the policy was revoked less than two weeks after it was enacted as it triggered rejection from major coal companies. The sudden revocation of the policy was indicated to be influenced by PEPs from the coal sector (Fauzia, 2022; Guitarra, 2022). In addition, informality practices are also indicated by the decision-making process, which operates through different mechanisms outside the formal rules. According to an interview with a member of NEC, the decision-making process in the energy sector is often made without a scientific base and tends to be pragmatic, for instance, the policies related to the development of 35 GW of power generation capacity in the 2015-2019 period. The policy is considered too optimistic about electricity demand, potentially causing SEC oversupply due to low electricity demand but increasing electricity supply (Safitri, 2022). Targeted for completion in 2019, but as of June 2021, there are still 0.7 GW or 700 MW of power plants in the planning stage (Kusnandar, 2022). Strong resistance from the coal sector, arguably reinforced by PEPs, also occurred in the discourse on the electric vehicles policy, carbon tax, the National Energy Grand Strategy, and the coal phase-down strategy.

7 Interview with former office of NCCC
8 Interview results with a former Senior Advisor to the Ministry with a portfolio of Investment Affairs
9 Interview with political scientist
10 Interview with the member of NEC

6.4 Financing

One of the challenges in Indonesia to tackle climate change comes from financing. The GoI still faces obstacles in closing the gap between the funding target to achieve the NDC and the available funds. According to FPA (2019), financing for climate change in Indonesia is dominated by domestic funding from the State Budget. Besides domestic funding, international funding also plays an important role in supporting developing countries, including Indonesia, in achieving climate commitment. In 2010, Indonesia's commitment to reducing GHG emissions gained international support, mainly from Norway, to decrease deforestation and forest degradation emissions through REDD+ schemes (Glover & Schroeder, 2017). However, according to the evaluation results of the REDD+ in Indonesia, the REDD+ Management Agency was ineffective in implementation actions at the regional level.

In the Updated NDC, the amount of climate financing required to achieve the Indonesian NDC target is US$322.86 billion by 2030. As one of the main target sectors in the NDC, financing needs for the energy sector are estimated to reach US$228 billion in 2018-2030. The Indonesian energy transition from coal to renewables also gained international support from the Asian Development Bank through the Sustainable and Inclusive Energy Program (SIEP) and the Global Green Growth Institute through the Sustainable Green Growth, Climate, and Environment Program (SGGP) (Suroso et al., 2022b). The SGGP and SIEP projects support renewable energy development in Indonesia by producing policy recommendations and policies for promoting and accelerating renewable energy investment. According to IESR (2022), several countries have committed to supporting energy transition in Indonesia through bilateral commitments and investment plans. However, the total value of financial support only reaches at least USD 14 billion, less than 37% of the total projected financing needed by 2025. This indicates that Indonesia needs more international support and private investment for the energy transition. Nevertheless, Indonesia cannot rely solely on international support for climate financing because, besides being provided in the form of loans, international support in Indonesia is still largely based on the preferences of the donor countries. Moreover, Indonesia also faces constraints in tapping international support for climate finance due to its limited capacity to fulfil the requirements (Suroso et al., 2022b).

Turning to Indonesian renewable energy, our first-year study (see Suroso et al., 2020) found that the financing for renewable energy development in Indonesia is still limited, even though renewable energy is expected to be the largest contributor to emissions reductions. Regarding public budget allocations, throughout 2018-2019 the total public budget allocated for climate mitigation in the energy sector by the Directorate of Renewable Energy and Energy Conservation of MoEMR is only USD 67 million per year (IESR, 2022). If this trend of public budget continues until 2025, the annual government budget will only contribute 0.83% of the USD 8 billion needed to achieve 23% renewable energy share in 2025. In addition, the state budget is only expected to finance up to 25% of the renewable energy sector, and the rest is expected to be financed through innovative financing such as green bonds, carbon trade, private funding, and others. According to Suroso et al. (2022b), the budget for the renewable energy sector has continued to decline, as seen from the decline in the number of renewable energy projects in the State Budget. Hence, financing for renewable energy development cannot rely on the State Budget since it is minimal. Therefore, Indonesia must develop innovative financing, such as optimizing the private/non-public sector to fulfil its climate commitments to close the funding gap.

Compared to renewable energy, fossil fuels still benefit from government subsidies. The GoI has disbursed Rp 404.32 trillion in fuel subsidies and with 88.5% of Indonesia's energy mix still relying on fossil fuels, the dominance of subsidies on fossil fuels will make renewable energy unprofitable and further discourage investment in renewable energy. Regarding renewable energy investment, IESR's Deep Decarbonization estimated that Indonesia will need to invest USD 20-25 billion annually to achieve a 100% renewable energy target by 2050 (IESR, 2022). To accelerate efforts to reduce carbon emissions, Indonesia also needs to spend USD 60 billion every year from 2030 to 2040. According to IESR (2022), the annual investment for renewable energy only reaches USD 1,62 billion from 2017-2021, still far below the annual investment of USD 8 billion to meet the 23% renewable energy target by 2025. As of Q3 2022, renewable energy investment has only reached USD 1.35 billion (34% of the ambitious annual target of USD 3.97 billion). Meanwhile, investment in fossil fuels was significantly larger than renewable energy investment, reaching USD 13.70 billion.

Our previous study (see Suroso et al., 2022a) mapped out some of the challenges in the development of renewable energy in Indonesia, including that renewable energy development has high risks and low returns due to the uncertainty of renewable energy pricing policies that are unfavourable to developers, renewable energy policies in Indonesia have not supported the creation of an attractive market for investors, and the roadmap NDC for energy still does not take sides on the renewable energy investors. This study found that government support is very limited, especially after the new order era, this condition is different during the new order era, where renewable energy development received a lot of support from the government through tax policies and incentives for renewable energy developers[11]. Moreover, the lack of bankable renewable energy projects, the uncertainty of fiscal and non-fiscal incentives, and the government's difficulty in justifying the allocation of renewable energy proceeds to investors also hinder the development of renewable energy in Indonesia (IESR, 2022).

Therefore, to meet the gap between the financing needed and the available funds to support the target of 23% renewable energy by 2025, various efforts are required, such as encouraging the creation of alternative sources of financing by various parties, including philanthropic donors, Multilateral Development Banks (MDBs), government and private sector, and increasing the role of EFMA to manage and allocate financial resources to the energy transition.

11 Interview with the Vice President of Geothermal Company

6.5 Key takeaways

1. Key actors in the Indonesian climate-energy governance belong to different clusters. However, the highest influence in energy policy-making is possessed by MoEMR.

2. The political commitment remains highly crucial in maintaining order for the energy regime to do a just transition. However, this commitment remains at stake due to many upcoming policy windows, which is highly emphasized by the Presidential election in 2024. Energy-related policies in Indonesia tend to slow the energy transition process by increasing fossil fuels over renewable energy.

3. The process of promulgating policies and regulations in the Indonesian energy sector is still coloured by informal practices, especially the emergence of PEPs in energy policy-making. Informality in Indonesian climate-energy governance has made it difficult for energy policies to abandon coal for renewable energy.

4. Financing for the Indonesian renewable energy sector is still limited, even though renewable energy is expected to be the largest contributor to emission reduction. Indonesia still faces obstacles in closing the gap between finance availability and the required finance to meet the 23% renewable energy target by 2025.

Chapter seven

Conclusions

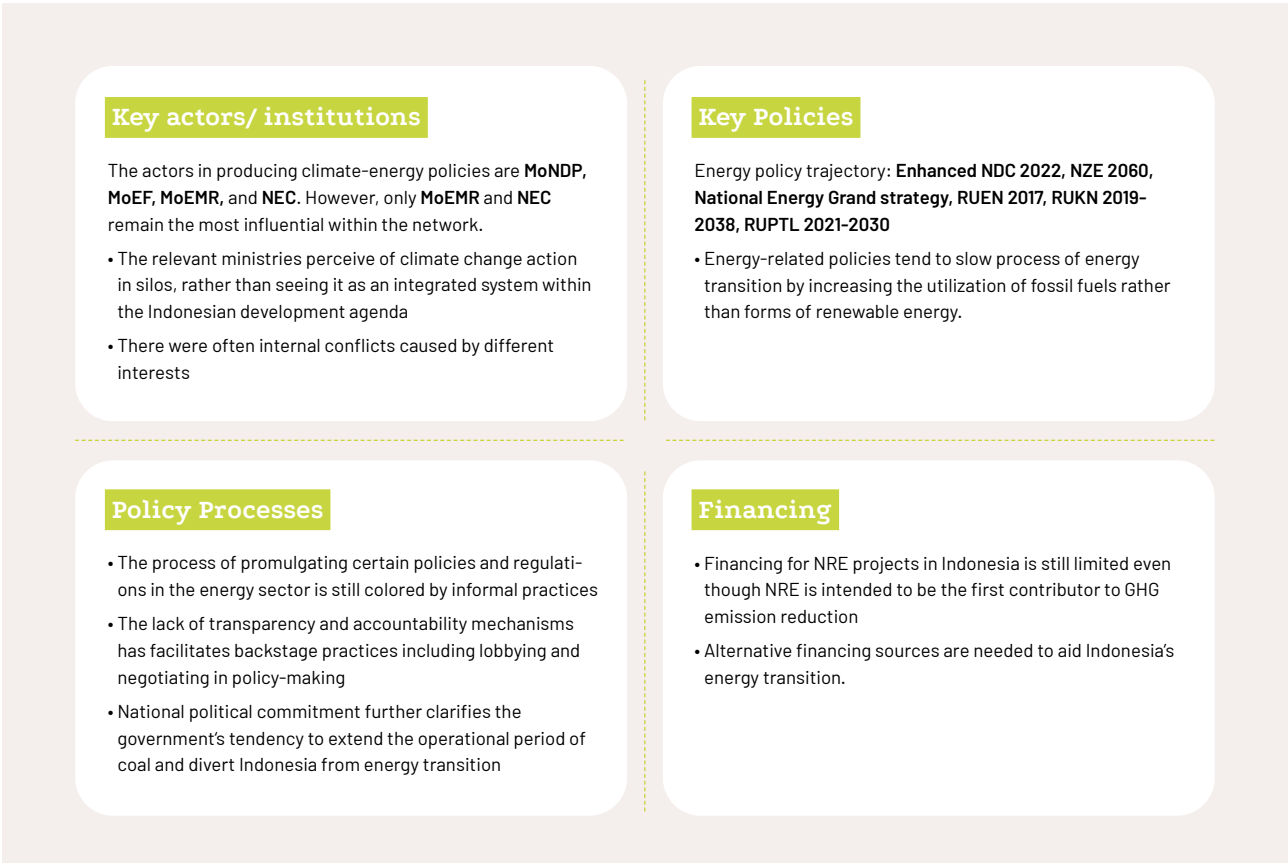
7. Conclusions

In this section, a summary of the study and policy implications will be laid out first. Academic contributions will be discussed next, followed by the study's limitations. Several research questions to study further will also be addressed.

7.1 Summary and the way forward

In this study, we identified the current Indonesian climate-energy governance model through four components of the governance framework: key actors/institutions, key policies, policy processes, and financing (see Figure 12). From the key actors, it is found that while the climate-energy policies are produced by MoNDP, MoEF, MoEMR, and NEC, only MoEMR and NEC have strong influences within the network. This situation becomes more complex as there are sectoral interests related to energy policies and climate policies in general, which often causes conflicts. Thus, we propose enhancing NEC's roles within the Indonesian climate-energy network. As the intermediary between the related ministries regarding the climate pledge and energy policies, this institution remains vital in advising the President and the ministries, especially regarding policies in the energy sector.

Figure 12 — The Indonesian Existing Climate-Energy Governance Model



Source: Author's Analysis, 2023

Setting a just transition pathway towards NZE 2060, including energy sovereignty and social justice, also requires a supportive institutional environment, where other components, including key policies, how policy is produced, and channeling financing mechanisms, are needed. Our findings suggest that the energy policy trajectory is still in favour of fossil fuels, particularly coal, rather than renewable energy. Nonetheless, the upcoming policy window of the Presidential election in 2024 will be either a strategic pivot towards renewable energy or, rather, a perpetuated energy trilemma. Furthermore, as to date the NRE Act is still being formulated, a commitment towards just transition should also be translated into this regulation. To make renewable energy more affordable and attractive to investors, need the right mix of policy instruments that provide incentives and are business-friendly.

To do a just transition, the context of policy processes is also considered. Under informality, decision-making processes involve back-stage practices by actors. Informality becomes a strategic tool for interest groups to lobby and negotiate in policy-making. Many informal practices colour Indonesian policy-making in general, which leads to policy inconsistency, especially in the energy sector, an intricate situation where energy-related policies favour fossil fuel proponents, impeding the just transition. These practices also include the PEPs coming from coal backgrounds that exert their influence that is still left unchecked. This lack of transparency and accountability mechanisms also asks for responses to secure the support for just energy transition, either by diminishing the roles of PEPs from fossil fuel industries, implementing disincentives for fossil fuels and incentives for renewable energy development, or rather, building a thorough monitoring and evaluation framework for the energy sector–not only for reaching the NDC goals by 2030 but also for just transition in the longer term. It is also suggested that the combination of mandatory and voluntary policy instruments to ensure a smoother just transition could also be done. A scorecard approach can also be used to increase the transparency and accountability of renewable energy or in favour of the policy-making process in Indonesia, while at the same time collectively implementing the just transition and reaching the NDC goal by 2030 and NZE by 2060 (see Suroso et al. 2022a). This approach should be integral to existing monitoring and evaluation platforms from other ministries, e.g., KRISNA as a budgeting performance evaluation system in MoNDP and the MRV system from MoEF. From our study (Suroso et al. 2022), the convergence of energy policy trajectory would likely happen if strong collective political commitment is present.

However, apart from the converging energy policy-making trajectory towards renewable energy, our previous study also highlights other requirements and notes to do so: the empowerment of both NEC to actively participate, if not lead, in energy policy-making and EFMA to channel the domestic and international climate funds for renewable energy projects. The international climate fund could be mobilized as long as the institutional stability is high enough to ensure the process flows smoothly. A coalition between Indonesia and other countries, i.e., G20, should agree on this collaboration. For example, multiple funding sources could also be streamlined through EFMA, where the bankability of any renewable energy projects should be thoroughly examined yet proportionately allocated. This opportunity requires the capacity building and financial allocation for EFMA to assess the project, which can be learned from collaboration with financial institutions in other countries. Other means of ICF mobilization could also be synchronized and improved at the national level, for example, through PT SMI, Jamkrindo (a credit guarantee company), and Askrindo (a credit insurance company), which are all supervised by MoF.

Another proposition for the GoI is to induce the private sector's contributions in just transition. While the presence of PEPs in energy policy-making is imminent, the narratives on the side of coal should be moderated, if not lessened, by increasing the presence of PEPs from the RE sector or limiting the influence of PEPs from the coal sector. As the GoI can revise and tighten policies or other instruments to prevent double directorial positions in energy-related state-owned enterprises, for instance, an overhaul of the Civil Servants Act. Nonetheless, the cost is still too high considering the upcoming Presidential election. More time, personnel, and financial resources are required to enact this instrument; hence it should be put under a longer time frame of just transition. The role of policy entrepreneurs, i.e., the renewable energy developer associations, is also crucial within just transition as they can advocate renewable energy developments.

Indonesia's climate-energy governance model is associated with four components of the governance framework: national climate actors/institutions, national climate-energy policy, policy-making process, and financing. The role of national climate actors/ institutions remains key in designing and implementing an overarching climate-energy policy and in institutionalizing long-term commitment towards just energy transition. National policies or regulations as a national government's commitment remain critical to enable a rapid transition towards low-carbon energy. A just energy transition must be mainstreamed in climate-energy policy performance as a legal basis for planning. To strengthen climate policy capacity, especially in the energy sector, policy-making must emphasize accountability, transparency, and trustworthiness of the actors/institutions' energy transition-related actions. Related to financing and investment, it is important to integrate state governance and non-state governance frameworks, such as civil society and the private/business sector, in responding to the complexities, dynamics, and uncertainties of policy-making in the context of climate change, especially in the energy sector. In addition, implementing policy instruments that use a combination of state regulatory frameworks and provide incentive mechanisms to the private sector and civil society in renewable energy development is also important to accelerate the energy transition.

7.2 Academic contribution, study limitations, and further research

In developing this climate-energy governance model, we have established a four-year study to propose the improvement of the components within the network. Substantively, we only focused on the development of renewable energy as the leverage of just transition. Further research on just energy transitions that consider the pillars of energy conservation and energy efficiency in Indonesia still needs to be conducted.

Next, employing social network analysis, in this report, we identified the most influential institutions as the key actors in climate-energy policy-making and what should be improved from them. Nevertheless, the study only used institutions as the nodes-not the personnel-within the network. An investigation using persons as nodes will enrich the insights due to the high-resolution data, particularly in identifying the brokers and their types within the Indonesian climate-energy governance. However, further studies need to be conducted as the brokers are not yet identified. Brokerage analysis here should be the next milestone to delve more into the Indonesian regime in the energy sector (see Butts, 2008). Also, the energy policy trajectory needs to be elaborated in a thorough

manner, as the position of the key actors producing the policies today is influenced by how the policy-making process was done in the past. This approach will also explore the possibilities of energy policy development pathways. Explaining the what, why, and how of the policy and connecting these dots will be beneficial in debottlenecking the conditions that hurdle the implementation of our proposed governance model. Additionally, combining these approaches under the analytical framework of discourse network analysis (DNA) will not only show the agendas and their proponents but also identify the flows of the former and which clusters they belong to (see Wibisono et al., 2023). The agenda champions could also be utilised to advocate for a just energy transition toward NZE 2060.

Chapter eight

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8. References

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Chapter nine

Appendix

9. Appendix

Appendix 1. Climate-Energy Policies

Periode	Climate-energy policy		Content
2007—2014	RPJMN 2009-2014	Rencana Pembangunan Jangka Menengah Nasional/ National Medium-Term Development Plan 2009-2024	A national development planning for a period of 5 (five) years 2009-2024
	RIPIN 2010-2035	Rencana Induk Pembangunan Industri Nasional/ National Industry Development Master Plan	Guidelines for government and industry actors in industrial planning and development
	Energy Act 2007		Energy implementation, including the establishment of the National Energy Council
	KEN 2014	Kebijakan Energy Nasional/ National Energy Policy	Energy management policy to create energy independence and national energy security (Achieving an energy mix of a minimum of 23% renewable energy)
	Electricity Act 2009		Business license to provide electricity
	RUKN 2008-2027	Rencana Umum Ketenagalistrikan Nasional/ National Electricity General Plan 2008-2017	National electricity policy, the Development plan of electric power system provision. The current condition of electricity supply, Electricity demand projection, Electricity supply investment
	RUPTL	Rencana Usaha Penyediaan Tenaga Listrik/ Electricity Supply Business Plan	Guideline for the development of electric power systems in SEC's operational area
2014—2019	RPJMN 2015-2019	Rencana Pembangunan Jangka Menengah Nasional/ National Medium-Term Development Plan 2015-2019	A national development planning for a period of 5 (five) years 2015-2019
	First BUR 2016	First Biennial update report 2016	The national inventory of anthropogenic emissions by sources and removal by sinks of all greenhouse gases (GHGs), including a national inventory report, as well as information on mitigation actions
	Second BUR 2018	Second Biennial update report 2018	Improvement on national GHG inventory report of anthropogenic emissions by sources and removal by sinks
	INDC 2015	Intended Nationally Determined Contribution 2015	Indonesia's transition to a low carbon future by describing enhanced actions and the necessary enabling environment for more ambitious goals
	First NDC 2016	First Nationally Determined Contribution 2016	Unconditional target of 29% and a conditional target of up to 41% compared to the business as usual (BAU) scenario in 2030
	RUEN 2017	Rencana Umum Energi Nasional/ National Energy General Plan 2017	Detailed share of RE in the energy mix
	RUED-P	Rencana Umum Energi Daerah-Provinsi/ Regional Energy General Plan-Province	Provincial government policy on Provincial level energy management plan
	RUED-Kab/Kota	Rencana Umum Energi Daerah-Kabupaten/ Kota/ Regional Energy General Plan-District/City	District/City government policies regarding District/City level energy management plans
	RUKN 2019-2038	Rencana Umum Ketenagalistrikan Nasional/ National Electricity General Plan 2019-2038	National electricity policy, Development plan of electric power system provision, Current condition of electricity supply, Electricity demand projection, Electricity supply investment
	RUKD	Rencana Umum Ketenagalistrikan Daerah/ Regional Electricity General Plan	Power supply system development plan developed by the provincial government which includes generation, transmission, and distribution of electricity.
	RUPTL	Rencana Usaha Penyediaan Tenaga Listrik/ Electricity Supply Business Plan	Guideline for the development of electric power systems in SEC's operational area
2019—2024	RPJMN 2020-2024	Third Biennial Update Report 2021	A national development plan for a period of 5 (five) years 2020-2024

	Third BUR 2021	Second Nationally Determined Contribution 2021	Update of Indonesia 2nd BUR, which contains some updates and improvements on National Circumstances; National GHG Inventory Report of Anthropogenic Emissions by Sources and Removal and Sinks; Information on mitigation actions and their effect; Information on Constraints and Gaps Related to Financial, Technical, and Capacity Needs and Received; also updated on Domestic Monitoring Reporting, and Verification.
		Enhanced Nationally Determined Contribution 2022	Unconditional target of 29% and a conditional target of up to 41% compared to the business as usual (BAU) scenario in 2030
			The unconditional target increases from 29% to 31.89%, and with international support (conditional) increases from 41% to 43.2% in 2030
		Rencana Usaha Penyediaan Tenaga Listrik/ Electricity Supply Business Plan	Regulatory framework on carbon pricing and carbon trading arrangements (including registration and valuation, economic incentives, and carbon levies and taxes)
			Guideline for the development of electric power systems in SEC's operational area
2024—2029	RPJMN 2025-2029	Rencana Pembangunan Jangka Menengah Nasional/ National Medium-Term Development Plan 2025-2029	A national development planning for a period of 5 (five) years 2025-2029
	NRE Act	New Renewable Energy Act/ Undang-Undang Energi Baru dan Terbarukan	Regulatory framework for renewable energy projects and incentivises the transition to green energy
	Feed-in tariff policy		A policy designed to support the development of renewable energy sources by providing a guaranteed, above-market price for producers.
	KEN	Kebjakan Energy Nasional/ National Energy Policy	Energy management policy to create energy independence and national energy security (Achieving an energy mix of a minimum of 23% renewable energy)

Appendix 2. Eigen Centrality Value of Each Actor within the Indonesian Climate-Energy Governance Network

NEC	0.41776357	DGE	0.47237628
MoI	0.12406030	DGOG	0.85003555
MoE	0.08132737	IICA	0.38675279
MoF	0.20998538	SKK Migas	0.19467320
MoA	0.12406030	MoPWH	0.19467320
MoT	0.16271014	SEC	0.42650906
MoNDP	0.23261028	IPPs	0.11915563
MoEF	0.21121995	NGC	0.59161862
MoEMR	1.00000000	Pertamina	0.59161862
CMfEA	0.21951113	FFDA	0.04639282
MoSOE	0.66948185	REDA	0.04639282
DpDF	0.13037049	DI	0.07529040
DpMANR	0.23554411	FI	0.07529040
AI	0.04528299	FPA	0.09942152
DoE	0.11196078	DGFRM	0.12126905
DoEMMR	0.26040207	DoDFSP	0.03421188
DGCCC	0.10403349	CfCCMFP	0.04536955
MoFA	0.04111886	FM	0.02360783
CMfMIA	0.41804817	ID	0.04898748
DGREEC	0.44003970		