SNAPFI STUDY

Towards Climate Governance Model for the Indonesian Energy Sector: Mapping on Actor Interaction

Indonesia

JULY 2021
About this report

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Project in brief
This project is a second-year study of Strengthening national climate policy implementation (SNAPFI): Comparative Empirical Learning & Creating Linkages to Climate Finance, investigated by the Climate Change Center, Bandung Institute of Technology collaborating with DIW Berlin. This project investigates the climate governance model in the Indonesian energy sector, particularly in reducing GHGs emission targeted at the Nationally Determined Contributions (NDC), by exploring the prominent stakeholders in the sector and how they interact in such landscape. The lenses are then focused on the renewable energy sector. The condition of renewable energy financing through international climate fund and investment is elaborated next, providing the insights on how the mechanism should be nurtured and improved.

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Indonesia

Towards Climate Governance Model for the Indonesian Energy Sector: Mapping on Actor Interaction

JULY 2021

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# Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>APBN</td>
<td>Anggaran Pendapatan dan Belanja Negara (State Budget)</td>
</tr>
<tr>
<td>BAU</td>
<td>Business as usual</td>
</tr>
<tr>
<td>BKPM</td>
<td>Badan Koordinasi Penanaman Modal (Indonesia Investment Coordinating Agency)</td>
</tr>
<tr>
<td>BPDLH</td>
<td>Badan Pengelola Dana Lingkungan Hidup (Environmental Fund Management Agency)</td>
</tr>
<tr>
<td>CMfEA</td>
<td>Coordinating Ministry for Economic Affairs (Kementerian Koordinator Bidang Perekonomian/ Kemenko Ekonomi)</td>
</tr>
<tr>
<td>CMfMIA</td>
<td>Coordinating Ministry for Maritime and Investment Affairs (Kementerian Koordinator Bidang Maritim dan Investasi/Kemenkomarves)</td>
</tr>
<tr>
<td>COVID-19</td>
<td>Coronavirus Disease 2019</td>
</tr>
<tr>
<td>DEN</td>
<td>Dewan Energi Nasional (National Energy Council)</td>
</tr>
<tr>
<td>EV</td>
<td>Electric Vehicles</td>
</tr>
<tr>
<td>FOLU</td>
<td>Forestry and Other Land Uses</td>
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<tr>
<td>GHGs</td>
<td>Greenhouse gases</td>
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<tr>
<td>GoI</td>
<td>Government of Indonesia</td>
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<tr>
<td>GWh</td>
<td>Gigawatt per hour</td>
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<tr>
<td>ICF</td>
<td>International Climate Fund</td>
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<tr>
<td>IDR</td>
<td>Indonesian rupiah</td>
</tr>
<tr>
<td>IPPs</td>
<td>Independent power producers</td>
</tr>
<tr>
<td>IUPTL</td>
<td>Ijin Usaha Penyediaan Tenaga Listrik (Electricity Supply Business Licence)</td>
</tr>
<tr>
<td>KEN</td>
<td>Kebijakan Energi Nasional (National Energy Policy)</td>
</tr>
<tr>
<td>kWh</td>
<td>Kilowatt per hour</td>
</tr>
<tr>
<td>LPG</td>
<td>Liquefied Petroleum Gas</td>
</tr>
<tr>
<td>LULUCF</td>
<td>Land use, land use change, and forestry</td>
</tr>
<tr>
<td>MMscf</td>
<td>Million standard cubic feet</td>
</tr>
<tr>
<td>MoEF</td>
<td>Ministry of Environment and Forestry (Kementerian Lingkungan Hidup dan Kehutanan/KLHK)</td>
</tr>
<tr>
<td>MoEMR</td>
<td>Ministry of Energy and Mineral Resources (Kementerian Energi dan Sumber Daya Mineral/KESDM)</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<td>--------------</td>
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</tr>
<tr>
<td>MoF</td>
<td>Ministry of Finance (Kementerian Keuangan/Kemenkeu)</td>
</tr>
<tr>
<td>MoI</td>
<td>Ministry of Industry (Kementerian Perindustrian/Kemenperin)</td>
</tr>
<tr>
<td>MoNDP</td>
<td>Ministry of National Development Planning (Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional – Kementerian PPN/Bappenas)</td>
</tr>
<tr>
<td>MoPWH</td>
<td>Ministry of Public Works and Housing (Kementerian Pekerjaan Umum dan Perumahan Rakyat/Kementerian PUPR)</td>
</tr>
<tr>
<td>MoRT</td>
<td>Ministry of Research and Technology (Kementerian Riset dan Teknologi/Kemenristek)</td>
</tr>
<tr>
<td>MoSOE</td>
<td>Ministry of State-Owned Enterprises (Kementerian Badan Usaha Milik Negara/Kementerian BUMN)</td>
</tr>
<tr>
<td>Mtoe</td>
<td>Million tonnes of oil equivalent</td>
</tr>
<tr>
<td>NDC</td>
<td>Nationally Determined Contribution</td>
</tr>
<tr>
<td>NRE</td>
<td>New Renewable Energy</td>
</tr>
<tr>
<td>PGN</td>
<td>Perusahaan Gas Negara (National Gas Company)</td>
</tr>
<tr>
<td>PLN</td>
<td>Perusahaan Listrik Negara (National Electricity Company)</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership (Kerjasama Pemerintah dan Badan Usaha/KPBU)</td>
</tr>
<tr>
<td>RE</td>
<td>Renewable Energy</td>
</tr>
<tr>
<td>Rp</td>
<td>Rupiah</td>
</tr>
<tr>
<td>RUEN</td>
<td>Rencana Umum Energi Nasional (National Energy General Plan)</td>
</tr>
<tr>
<td>RUKN</td>
<td>Rencana Umum Ketenagalistrikan Nasional (National Electricity General Plan)</td>
</tr>
<tr>
<td>RUPTL</td>
<td>Rencana Usaha Penyediaan Tenaga Listrik (Electricity Supply Business Plan)</td>
</tr>
<tr>
<td>SOE</td>
<td>State owned enterprises</td>
</tr>
<tr>
<td>USD</td>
<td>United States dollar</td>
</tr>
<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
</tr>
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CHAPTER ONE

Introduction
The achievement of NDC target on GHG emissions reduction in Indonesia has been calculated since 2020. Based on the Paris Agreement Ratification Act (Law 16/2016), Indonesia voluntarily pledged to reduce emissions by 29% on its own efforts, and up to 41% with international support in 2030. Currently, the emission reduction has only reached half of the 2019 target of 24%. GoI has formulated the NDC roadmap both for mitigation and adaptation. In the energy sector, it is expected that the total emission reduced would be 1,355 MTCO₂e or around 11% of total GHGs emission (CM1) in 2030. The energy sector is the second highest sector contributed to Indonesia GHG emission after the FOLU sector. The NDC simulation shows that the emission from the energy sector will continue to rise until 2030, while the FOLU sector will decrease gradually, and the simulation result shows that the energy sector will overtake the FOLU sector between 2020-2030 (Dewi, 2019; KLHK, 2020). In detail, three highest GHG emissions sources in the energy sector are from the subcategory of industrial energy (coal-based power plant, oil refinery, and coal related processes), transportation energy, and manufacture (KLHK, 2020).

In the Indonesia NDC roadmap for the energy sector (Dewi, 2019), it is shown that there are four pillars of decarbonisation in energy sector. From the highest proportion to the lowest are namely: NRE development (47.6%); energy efficiency (30.8%); clean energy (18.4%); and fuel switching (3.2%). Therefore, the NRE is the backbone of emission reduction in the Indonesia energy sector. Additionally, the national level energy policy (KEN and RUEN) has established that Indonesia’s energy mix would constitute 23% RE by 2025. The roadmap further elaborates that three main NRE sources are geothermal, hydropower, and biofuel. The development of NRE, particularly in the power generation sector, is favourable in the emerging economies due to the varying available mitigation alternatives that can be utilised at relatively low costs, i.e. wind, solar PV, and hydro power (Fragkos et al., 2021).

There are few issues found during our first-year study regarding the NRE development in Indonesia (see Suroso et al., 2020). First, the financing for NRE in Indonesia is still limited. APBN is only expected to finance up to 25% in forms of tax incentives, central government expenditure, and local government or village fund. The rest is expected to be funded through Green Climate Fund (GCF), SDG Indonesia One, BPDLH, PPP scheme, private funding, and others. Second, despite the high interest to invest on NRE, the electricity price set by the GoI is still considered low and causing investors to back down.

From the policy landscape standpoint, various ministries have published a number of specific policies related to the energy sector (Suroso et al., 2020). These policies are in the form of national bill (Undang-undang/UU) and or national bill draft (Rancangan Undang-undang/ RUU), Government Regulation (Peraturan Pemerintah/PP), Presidential Regulation (Peraturan Presiden/Perpres) and Ministerial Decree (Peraturan Menteri/Permen), which regulates at various levels of specification. The first-year study shows that with the current policy landscape, such as the electricity pricing policies, Low Carbon Development Initiative (LCDI), Electricity General Plan (RUPTL), NRE Bill draft (RUU EBT), and others, it would be difficult to achieve the NDC target timely.
The first-year study also shows that the national level policies were translated differently at the lower-level policies and thus sometimes overlapping with each other. These conflicting policies indicated that the NDC target is still approached and seen partially by each sector due to the vested sectoral interests and way-of-thinking. In addition, although the procedure and mechanism of policy-making in Indonesia is clear, but the process of promulgating certain regulations and policies are still coloured by manual and informal processes between the actors.

It is understood that to achieve the NDC target in the energy sector, the involvement of state and non-state actors are essential. The interactions between these actors are frequently occurred in the informal settings, thus coined the term ‘informality in governance’ or informal governance. Informal governance can be defined as a means of decision-making that is un-codified, non-institutional and where social relationships play crucial roles (Harsh, 2013). It can create innovation positively because informal governance can assist in solving policy problems which cannot easily be solved by formal government institutions, leading to more effective and innovative decision-making. Negatively, it may weaken transparency, accountability, and legitimacy by undermining traditional yet more formal administrative structures (Ayres, 2016). In certain European countries, the emergence of informality processes in decision-making is triggered by the maturity of the political system. The sheer volume and complexity of decisions that has to be made is also causing the need for adopting some less formalised means of policy-making and implementation (Peters, 2006).

In Indonesia itself, the informality in governance has shown throughout most of the presidential transitions for the past 15 years, as evident in our first-year study (Suroso et al., 2020). In the energy sector, for example, the second and third-tier policies can be quite deviated from the first tier (national bill/undang-undang) legislation. This occurred through various closely connected negotiations. The result from our first-year study has indicated this, however, the stakeholders interviewed were mostly from government officials, and there is a need to obtain more information from various stakeholders, including private sectors, PLN, NGO, policy-makers, etc. With this additional information, on the second-year study, the energy governance model will then be identified to understand which interaction and institution need to be intervened for more effective policies. The research question in this study is “Which prominent stakeholders are involved in the Indonesian climate-energy sector and how do they interact with each other?”.

From that research question, the aim of this study is to identify and map actors’ interaction as an initial step towards developing the climate governance model for the Indonesian energy sector. This study used a qualitative approach by analysing information from interviews with several key informants to create a stakeholder interaction. There were 10 informants interviewed, consists of government officials, practitioners, experts, and private sector.

The scope of this research is climate governance in the energy sector. On the energy sector, we limit the discussion only to the sub-sector of electricity. Energy for transportation and industry, for example, is not covered in this current study.
This document is structured as follows: the issues from literature review and first year report on energy governance and NRE development is laid out next, followed by methodology used in this study. The profile of Indonesia energy sector and energy policies follows the preceding part, followed by the description and analysis on actors involved in the NRE development and NRE investment. Two reviews of NRE investment in other emerging economies are laid out next, followed by conclusion and recommendation of this report.
CHAPTER TWO

Methods
This study employs a qualitative approach to answer the research question. The data were collected through in-depth interview (see Annex 1 for the lists of questions), desk study, and literature review. Several respondents coming from various institutions in Indonesia related to the energy sector were interviewed in the period of December 2020 until March 2021 (see Table 1). Relevant statistics and supporting reports were collected during the desk study. Pertinent academic articles and books were also studied to contextualise and lead the analysis. The analysis includes descriptive statistics and content analysis. Descriptive statistics was done to add several illustrations of the Indonesian energy landscape into the narratives. Content analysis was done to structure the findings from the respondents and answer the research questions. As this report updates the SNAPFI Indonesia Country Study last year (see Suroso et al., 2020), the stakeholder mapping will be also updated.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Position</th>
<th>Institution</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Public policy expert</td>
<td>-</td>
<td>M</td>
</tr>
<tr>
<td>B</td>
<td>Former Deputy</td>
<td>Presidential Chief of Staff Office</td>
<td>M</td>
</tr>
<tr>
<td>C</td>
<td>Manager</td>
<td>Kemitraan (Partnership for Governance Reform)</td>
<td>M</td>
</tr>
<tr>
<td>E</td>
<td>Multilateral Funding Division</td>
<td>Ministry of National Development Planning</td>
<td>M</td>
</tr>
<tr>
<td>F</td>
<td>Directorate of Economic Development and Environment</td>
<td>Ministry of Foreign Affairs</td>
<td>M</td>
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<tr>
<td>G</td>
<td>Project Investment Advisor to Green Climate Fund</td>
<td>Global Green Growth Institute (GGGI)</td>
<td>F</td>
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<td>H</td>
<td>Senior Researcher in International Collaboration for Climate Change Finance</td>
<td>Ministry of Finance</td>
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<td>I</td>
<td>Climate Change Division</td>
<td>PLN</td>
<td>F</td>
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<tr>
<td>J</td>
<td>Senior New Venture Development</td>
<td>Star Energy Geothermal</td>
<td>M</td>
</tr>
</tbody>
</table>

NVivo is used in this research to organise, analyse and find insights in unstructured or qualitative data from the interviews. Through NVivo, it can show a tree map diagram (see Figure 1) that shows group of data as a set of rectangles of varying sizes. Size indicates the amount of data sources that are used as reference. The tree map is scaled to best fit the available space so the sizes of the rectangles should be considered in relation to each other. Larger areas display at the top left of the chart, smaller rectangles display toward the bottom right.
Based on the interviews, the actors frequently mentioned during the discussions signify their importance in the Indonesian energy sector (see Figure 2). MoEMR, MoI, MoEF, MoSOE, CMfEA, MoF, and MoNDP are among the most frequently mentioned by the stakeholder when they were asked about the Indonesian energy landscape. By the topics, PLN and its centrality in power generation sector is mostly mentioned, followed by sectoral silos and interests between the stakeholders.
A stakeholder analysis also conducted in this research to evaluate the influence and interest of related stakeholders in particular issue. In this study, the importance of stakeholder exemplifies the priority given to satisfying the needs and interests of each stakeholder in the energy sector. The stakeholder analysis also includes the elaboration of influence dimension in energy sector. Influence is defined as the power that a stakeholder has to facilitate or obstruct the achievement of an activity’s objective. In another words, the extent to which the stakeholder can persuade or coerce others into making decisions and following a certain course on action. For this report, stakeholder analysis is conducted to deep dive into the role of Indonesia energy sector’s stakeholders. Recommendations of how the related stakeholders should be treated will thus be defined. This analysis helps to mitigate risk and discover effective engagement plan among these stakeholders. The steps for the analysis are first to identify key stakeholders in Indonesia energy sector, assess and analyse stakeholders influence with their level of interest from interview and secondary data, and to determine priority map as seen on Figure 3.
The priority map as seen on Figure 3 has two axes. The X axis represents stakeholder’s interest to the energy sector, in which their interest gets higher along the line. The Y axis represents stakeholder’s power to regulate or bring impact to the energy sector, as it gets higher along the line. From the diagram, there are four quadrants in the stakeholder mapping tool. This quadrant helps to analyse stakeholder’s position and treatment that should be given for each stakeholder.

1. Manage closely (High power – High interest): The most important set of stakeholders and should be prioritized as they carry a high level of influence and power. They are very critical to any decision-making.

2. Keep satisfied (High power – Low interest): This stakeholder needs to be managed actively enough to keep their interests satisfied as they carry a high level of power but low interest. They need regular updates, and their feedback is important.

3. Keep informed (Low power – High interest): This stakeholder needs to be kept informed of the engagement, as they carry a high level of interest but low level of power. They tend to be the customer base from the sector.

4. Monitor (Low power – Low interest): This stakeholder needs to be monitored but with minimum effort to only maintain the relationship, for example only be informed when there’s big steps from the energy industry, as they carry a low level of interest and power.

Source: Mercy Corps (2018)
CHAPTER THREE

Energy profile of Indonesia
In this section, the Indonesian context will be elaborated by its energy sector based on the following structure: the energy sector in Indonesia, the Indonesian energy policies, international pledge regarding NDC, the responses to COVID-19, and summarised by several key takeaways.

### 3.1 Indonesia: Navigating through energy trilemma

#### 3.1.1 The coherence of vision/national targets regarding climate change

Regarding the national GHGs emission reduction target in energy and power generation sectors, NDC as an international climate commitment has driven the energy policymaking to be more climate conscious. Several key policies have been passed as a Government Regulation, Presidential Regulation, or a Ministerial Decree of Energy and Mineral Resources and set the targets on energy and power generation sectors (see Table 2). The First NDC 2016 projects that the energy sector will contribute the most significant portion in GHGs emission level in 2030 BAU scenario (Republic of Indonesia, 2016). Beside this international climate commitment, the energy sector has also a different policy trajectory, namely KEN 2014 and RUEN 2017. RUKN 2019-2038 and RUPTL PLN 2019-2028 also become main policies in electricity subsector as the subsector is also included in energy sector. RUEN 2017 explicitly states both scenarios of GHGs emission reduction by 2030, while RUKN 2019-2038 and RUPTL 2019-2028 only state the target of NRE share in energy mix by 2025. However, such promise may be compromised due to the coal and crude oil utilisation. In RUEN 2017, although the shares of coal and crude oil are modelled to decrease up to 2050, the primary energy supply from those two consistently increases. From that, the annual utilisation of those two is capped at certain number and thus reflects the energy trilemma, particularly meeting the energy demand in the nation. In the Indonesian law hierarchy, RUEN should be followed by the derivation in subnational government, taking form as RUED-P and RUED-Kab/Kota. The similar operationalisation also is done to RUKN.

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1 In this study, we propose this term to describe a domestic condition having to choose between meeting national energy demand by national capacity (energy sovereignty), enhancing access to energy (energy equity), and transitioning to less-harm and climate change mitigating energy system (environmental sustainability).

2 See Figure 18 in Annex 2 for the Indonesian law hierarchy.

3 Rencana Umum Energi Daerah Provinsi (Provincial Energy General Plan) and Rencana Umum Energi Daerah Kabupaten/Kota (Municipal Energy General Plan).
### TABLE 2

**Targets in the Indonesian energy policies**

<table>
<thead>
<tr>
<th>Energy Policy</th>
<th>Targets</th>
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<tr>
<td><strong>First NDC 2016</strong></td>
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</tbody>
</table>
› 29% unconditional reduction by 2030  
› 41% conditional reduction by 2030 with international help |
| **RUEN 2017** |  
› 29% unconditional reduction by 2030.  
› 41% conditional reduction by 2030 with international help.  
› 23% of RE share in the energy mix by 2025, and 31.2% by 2050.  
› The elaboration of energy indicator. |
| **RUKN 2019-2038** |  
› 23% of renewable sources share in energy mix by 2025.  
› Oil-based power plant is only for extenuating circumstances.  
› Coal power plant should use clean coal technology for local primary energy demand.  
› Nuclear power plant should be built in accordance with KEN.  
› Special Economic Zone, tourist destination area, and industrial area are prioritised for the transmission. |
| **RUPTL 2019-2028** |  
› 6.2% projected average demand  
› Planning to build power plants with total capacity of 56,395 MW  
› Energy mix for power generation:  
› 54.6% coal  
› 23% NRE  
› 22% natural gas  
› 0.4% crude oil  
› Transmission line construction of 57,293 km  
› Substations of 124,341 MW total capacity  
› Distribution line construction of 472,795 km  
› Distribution stations of 33,730 MVA |
3.1.2 The dominance of fossil fuels over NRE

The energy resources in Indonesia may be looked at from the lenses of energy development and consumption. For energy development during 2008-2019, primary energy supply trend is increasing (see Figure 4). The supply, however, was dominated by coal (35.87%) and crude oil & product (33.70%), where the former increased significantly from 2017 and peaked in 2019. For renewable energy, biomass and biofuel contributed 6.62%, followed by hydro power (2.43%). Renewable energy sources remain consistent of being underutilised, where wind (0.07%) and solar PV (0.03%) are among the smallest contributors of primary energy supply.

**FIGURE 4**

**Primary energy supply, 2008-2019**

As a subsector of energy, electricity in Indonesia is also still dominantly powered by coal through steam power plant (PLN, 2020). The second largest contributor is combined steam-natural gas power plant. From renewable energy, hydro and geothermal power plant contributes by 5.10% and 2.12%, respectively. The domination of PLN in power generation sector is perpetuated as most electricity is generated from either PLN’s or rented power plants, while only 30.52% electricity is produced by IPPs.
As per the Indonesian energy trilemma, the coal industry has been growing since 2009 (Kusuma, 2019) and reached a share of 35.87% in primary energy supply by 2019 (Kementerian Energi dan Sumber Daya Mineral, 2020a). For fossil fuel taking form as oil, proven oil reserves decrease over years, starting at 4.3 billion barrels in 2009 and ending at 2.48 billion barrels in 2019 (Kementerian Energi dan Sumber Daya Mineral, 2020a). In Indonesia, oil sale in 2019 is dominated by Bio Gasoil, Gasoline RON 90, and RON 88 with percentage of 39.99%, 25.84%, and 15.55%, respectively (Kementerian Energi dan Sumber Daya Mineral, 2020a). RON 95, RON 90, and RON 88 are sold by Pertamina4 under the name of Pertamax, Peralite, and Premium, respectively, where if combined, all three accounts for 41.83% of total oil sale in 2019 (Kementerian Energi dan Sumber Daya Mineral, 2020a; transportpolicy.net, n.d.).

In 2019, by source, the largest final energy consumption in Indonesia taking form as fuel at 26.45%, followed by the biogas oil at 19.05%, coal at 16.62%, electricity at 15.79%, and gas at 9.39% (Kementerian Energi dan Sumber Daya Mineral, 2020a). By sector, the final energy consumption in Indonesia is highly dominated by the transportation sector in 2019 at 43.87%. The energy consumption share is followed by industry at 37%, household at 14%, commercial at 4% and other sectors at 1% (Kementerian Energi dan Sumber Daya Mineral, 2020a). A study identifies that the energy access in Indonesia improved during 2010-2020, although energy spending share was still below 10% including for low-income households (Hartono et al., 2020).

In power generation sector, the connected apparent power in 2019 increases from that in 2018 (PLN, 2020). The residential customers are the highest number of being connected to PLN’s distribution network, followed by industrial and commercial. The electrification rate in Indonesia, however, decreases to 95.75% (PLN, 2020). This condition may have to do the different calculation of electrification ratio. Up to 2018, the calculation was done in a provincial level where if the calculation is detailed into village level, the electrification rate decreases (Wiratmini, 2019). In detail, the miscalculation is allegedly done by generalising that if one household in a village is connected to electricity, then the whole households in that village are assumed to do so (Setjen DPR RI, 2020). Also, due to COVID-19 pandemic, the realisation gets harder since the geography of remote areas have technical difficulties to be connected to PLN’s network (CNN Indonesia, 2020). Therefore, PLN plans to expand the network coverage by building 410,158 kilometres of medium voltage distribution network and 585,149 kilometres of low voltage distribution network (Meilanova, 2018). In particular, PLN also includes small-scale hydro and solar PV mini-grids in electrification plan for Maluku and Papua and targets for 99% electrification in these provinces by 2023.

In the Indonesian energy policies such as RUEN 2017, RUKN 2019-2038, and RUPTL 2019-2019-2028, NRE is directed to contribute 23% of total energy mix up to 2030. From a study conducted in 2019 (Kementerian Energi dan Sumber Daya Mineral, 2020a), the renewable installed capacity on-grid is dominated by biomass (60.48%), followed by hydro power (35.09%). Biogas, solar power plant & solar PV, and micro hydro is among the least contributors in NRE mix, summing up to only 4.42% (Kementerian Energi dan Sumber Daya Mineral, 2020a).

4 A SOE responsible for managing oil and gas extraction in Indonesia.
In 2020, the construction delays and logistical challenge due to social restriction measures following the COVID-19 pandemic impede the construction of several renewable power plants, with total added capacity is only 187.5 MW mostly from hydro power (IESR, 2021). 15.36% of the total power capacity is solar power, which include rooftop solar installation and 2017’s IPP projects that came online in 2019 (IESR, 2021).

3.2 The vested sectoral interests in energy sector

Energy industries in Indonesia are considered as heavily regulated and bound by regulatory regimes. From Figure 5, all the regulations are bounded by the 1945 Constitution as the highest law in Indonesia. The Energy Act (Law 30/2017) is seen as a centre of energy regulation mapping. There are two regulations that are being drafted and those are Renewable Energy Act and Grand Strategy of National Energy that have the possibility to be inaugurated with presidential regulation. The GoI’s commitment in reducing GHG emission and mitigating climate change are shown from considering renewable energy to have its own law. As the law is still on-progress, it is hoped that the law is still in-line to the Energy Act, hence the strategies are integrated. On the other hand, the Grand Strategy of National Energy is being made to cater the slowdowns of the national economy because of the COVID-19. The overview of the energy sector in Indonesia has involved layers of regulation hierarchy from the most strategic into the most technical through ministerial regulation level especially under the MoEMR. The perspective of energy from the GoI also changes overtime. From the figure below it is seen that the oldest law, Law 22/2001, regulates oil and gas as conventional sources of energy. Overtime, the GoI has already become aware of climate change; committed to and ratified the Paris Agreement in 2016. The GoI’s view on conventional energy started to change as renewable energy was considered in the Rencana Umum Energi Nasional/RUEN (National General Energy Plan) through Presidential Regulation 22/2017, and not until 2020, the GoI decided to make it as its own law.
However, a new omnibus bill titled Job Creation Act was enacted in November 2020 as Law 11/2020 on Job Creation. Due to its status as an omnibus bill, many controversies have emerged ever since, particularly on the prediction on its negative impacts towards the environment (see Annex 2). However, due to the bill not fully operationalised by the enactment of its derived policies, this study does not cover the interaction between Job Creation Act and its influence on the Indonesian energy sector.

**Source:** Authors’ analysis, 2021
3.3 The Indonesian commitment of NDC in the governance context

Since the establishment of Paris Agreement Ratification Act which shows the Indonesian commitment to NDC, the changes to NDC commitment only occurred once. In the G20 meeting in Pittsburgh, USA, 2009, President Susilo Bambang Yudhoyono voluntarily proposed a non-committed target for Indonesia NDC was 26% for CM1 and 41% for CM2. The target then revised during President Joko Widodo’s term into 29% for CM1 and 41% for CM2 and these targets were finally legalised through Paris Agreement Ratification (Law 16/2016).

Since then, the derivation form of this Act was formulated, and the NDC mitigation and adaptation roadmap were also published later in 2020-2021. Under the COVID-19 situation, the targets for various sectors and subsectors are still the same, thus creating a demand for climate funding quite large from APBN and other sources. However, the climate budget shape in 2021 does not reflect these demands. Looking at this situation, there are growing concerns that the NDC targets will be harder to achieve, especially if the state and ministry budgets are still using similar shape as previous years.

3.4 Responding to COVID-19 pandemic: Build-Back-Better

The COVID-19 pandemic significantly affected the global energy sector with the energy sector demand plunged to a level below the previous years (IESR, 2021). Based on the cross-country synthesis report (DIW Berlin, 2020), the Indonesia economic budget deficit in 2020 reached -0.4%, which creates a great concern in terms of financial restoration. This situation might impact negatively on the climate budgeting landscape, in which there is a suspicion that it will narrow the fiscal space for financing climate change actions. Thus, as a response to COVID-19, it will be important for the integration of economic recovery activities with the climate change agenda covered in a term entitled "green stimulus package." Based on the assessment of Green Stimulus Index, conducted by Vivid Economics (2020), the fiscal stimulus provided by the GoI is still dominated by Brown Instruments rather than Green Instruments. In energy sector, Despite approximately USD 6.76 billion allocated by the GoI as subsidies and incentives for different energy types, the support for clean energy development only reached a 3.5% share of the total budget (IESR, 2021). Furthermore, the overall investment in the energy sector has signified a downturn where coal sector investment bore the most severe brunt, with only 50.3% realisation against the government-set target for 2020 (IESR, 2021).

To encourage the implementation and integration of green aspects into various policies and stimulus programs, both domestic and foreign funding support is required.
These various climate change financing mechanisms are used in various types of funding instruments, including Green Climate Fund, Global Environment Facility, Adaptation Fund, including private sector engagement such as green sukuk, bond investors, and philanthropy. There is also Environment Fund (managed by BPDLH) but it has not been fully operational yet until the early of this year, and none of the existing funding instruments are channelled for energy projects, mostly forestry and land use. The GoI tends to encourage the optimisation of financing mechanisms through grants and investment, especially through bonds and sukuk because they tend to have lower interest rates and tend to be flexible amidst an economic crisis. Green sukuk is one of the most prominent forms of ICF because green sukuk supports green investment, which also increases revenue in APBN. Retail green sukuk also has the potential to become a window for climate change financing amidst the COVID-19 pandemic, especially in the energy sector. Overall, the encouragement of green sukuk has the potential to become a strategic means towards Build-Back-Better policy in response to COVID-19 pandemic.

### 3.5 Key takeaways

- The key national energy policies accounts for the development of RE, particularly fulfilling 28% share in energy mix by 2038. Those energy policies include: First NDC 2016, RUEN 2017, RUKN 2019-2038, and RUPTL PLN 2019-2028.
- Primary energy supply trends increase over years. The energy consumption indicated by final energy consumption and electricity connected apparent power is also increasing. However, there is a miscalculation of electricity rate in 2019.
- COVID-19 pandemic gives hurdles to the development of RE power plants due to construction delays and logistical challenge.
- The GoI tends to encourage the optimisation of financing mechanisms through grants and investment in developing green project, particularly amidst the pandemic.
CHAPTER FOUR

Towards the NRE-based power generation
In this section, the transition towards power generation sector from NRE will be elaborated. After current state is discussed, the analysis unravels more actors in the Indonesian energy sector and puts them in the stakeholder’s constellation. After that, the bridging fuels and other means of transition are also analysed, followed by the implications of new energy policies into NRE development and possible outcomes.

### 4.1 Current state: The difficulties in transitioning into NRE

#### 4.1.1 The dynamics of coal price in Indonesia

Towards phasing out from coal into NRE-based power generation, the coal price index (CPI) for power plant is one of the indicators that show the difficulties in phasing out, as it indicates the Indonesia’s coal market in general and is used as the reference prices by power plants and IPPs which accounts for royalty to the GoI and official payment calculations. The coal price index for power plant in Indonesia fluctuates since 2009 using 2008 as the base year of overall calculation (see Figure 6). The trend is increasing since 2008 and peaking in 2014. However, there is a significant decrease in 2015 reaching around 125.

**FIGURE 6**

Coal Price Index for power plant

![Coal Price Index for power plant](image)

*Source: Kementerian Energi dan Sumber Daya Mineral, 2020a*
After Q1 of 2021, the Indonesian Coal Mining Association (Asosiasi Pertambangan Batubara Indonesia/APBI) said that several producers will revise the production target in 2021 under the approval of MoEMR (Sari and Dewi, 2021). This condition is influenced by the increase in Coal Reference Price (Harga Batubara Acuan/HBA) by 2.6% to US$ 86.86/tonne (see Figure 7), hence the producers predict that the coal price will increase this year. Globally, coal price trend in 2021 is also predicted to be better than last year, as the demand also is predicted to increase by the global economy recovery (Sari and Dewi, 2021). From the government perspective, to keep the coal reference price under USD 70 per tonne, the MoEMR issued a decree in March 2018 that capped the price of coal sold to power plants at a maximum USD 70/tonne for coal with a calorific value of more than 6,000 kilocalories (kcal)/kg gross as received (Bridle et al., 2019).

FIGURE 7

Coal reference price in Indonesia (in US$)

Source: Kementerian Energi dan Sumber Daya Mineral (2021a)
4.1.2 NRE power plants: Lower cost in the long run

Another indicator that can be used to see the difficulties of phasing out from coal is average power plant operational cost. In 2019, the diesel power plant had the highest average power plant cost (see Table 3) by fuel with the cost of Rp2,454.32/kWh, followed by gas power plant and steam-gas power plant. By maintenance, however, the solar power plant has the highest average operational cost of Rp898.51/kWh, followed by diesel and gas power plant. By staff, having the highest average operational cost is solar power plant with cost of Rp1,022.37/kWh. In total, the highest average operational cost is the solar power plant with Rp11,317.97/kWh, followed by diesel and gas. The lowest average operational cost is hydro power plant, steam power plant, and geothermal power plant. As the steam power plant remains one of the lowest, this condition means that the use of coal is highly likely to be perpetuated.

TABLE 3

Average power plant operational cost (Rp/kWh)

<table>
<thead>
<tr>
<th>Type</th>
<th>Fuel</th>
<th>Maintenance</th>
<th>Staff</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>71.58</td>
<td>35.05</td>
<td>28.71</td>
<td>599.71</td>
</tr>
<tr>
<td>Steam</td>
<td>445.85</td>
<td>47.49</td>
<td>10.72</td>
<td>653.12</td>
</tr>
<tr>
<td>Geothermal</td>
<td>833.03</td>
<td>18.22</td>
<td>27.25</td>
<td>1191.25</td>
</tr>
<tr>
<td>Steam-Gas</td>
<td>1065.18</td>
<td>27.32</td>
<td>13.97</td>
<td>1357.75</td>
</tr>
<tr>
<td>Gas</td>
<td>1908.93</td>
<td>126.51</td>
<td>32.38</td>
<td>2570.03</td>
</tr>
<tr>
<td>Diesel</td>
<td>2454.32</td>
<td>387.44</td>
<td>145.33</td>
<td>3308.26</td>
</tr>
<tr>
<td>Solar</td>
<td>0.00</td>
<td>898.51</td>
<td>1022.37</td>
<td>11317.97</td>
</tr>
</tbody>
</table>

Source: PLN, 2020

The average power plant operational cost for NRE, excluding solar power, is considerably cheaper compared to fossil fuel power plants (see Figure 8). The operational cost also covers the fuel, staff, and maintenance components, where indeed although the fuel cost of power plant is zero, the staff and maintenance costs are still huge than those of other fossil fuel power plants. The average operational cost for geothermal and hydro power plants is among the lowest. Such conditions may be determined by land permits, technology costs, and an elevated cost of finance (Ordonez and Eckstein, 2020).
Based on the calculation of levelized cost of electricity (LCOE) in Indonesia\(^5\), the power plants from renewable sources have the least LCOE compared to fossil fuels power plant (see Table 4). Interestingly, the utility scale solar PV has the lowest LCOE while diesel power plant is the highest. However, ocean wave energy is not included in the calculation, even though this RE source is very promising around the south parts of Indonesia, such as southern part of Java, Bali and West Nusa Tenggara as well as southwest part of Indonesia (Ribal et al., 2020)

The LCOE can be used as a proxy in estimating the cost of power generation in 2030 (see Table 5). Using this calculation based on BAU scenario, the highest average total cost of electricity generation in 2030 (US$/GWh) is diesel power plant, followed by biogas and coal. The lowest average total cost is gas power plant, followed by onshore wind and biomass power plant. Both solar PV and hydro power plant have less average total cost in generating electricity than coal power plant. Using the BAU scenario, the total cost of electricity generation by 2030 will be around US $ 8.76 billion.

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\(^5\) LCOE is calculated using the project capital, operations and maintenance, and financing costs over its lifespan.
## TABLE 4

**Levelized cost of electricity based on power plant type**

<table>
<thead>
<tr>
<th>Power plant technology</th>
<th>LCOE (US$/MWh)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single cycle gas turbine</td>
<td>78.75</td>
</tr>
<tr>
<td>Combined cycle gas turbine</td>
<td>51.79</td>
</tr>
<tr>
<td>Sub-critical pulverised coal</td>
<td>67.17</td>
</tr>
<tr>
<td>Super-critical pulverised coal</td>
<td>57.33</td>
</tr>
<tr>
<td>Ultra-super-critical pulverised coal</td>
<td>59.67</td>
</tr>
<tr>
<td>Onshore wind</td>
<td>52.38</td>
</tr>
<tr>
<td>Utility scale solar PV</td>
<td>39.4</td>
</tr>
<tr>
<td>Geothermal</td>
<td>41.65</td>
</tr>
<tr>
<td>Biomass</td>
<td>65.43</td>
</tr>
<tr>
<td>Hydro power</td>
<td>50.83</td>
</tr>
<tr>
<td>Mini hydro power</td>
<td>66.79</td>
</tr>
<tr>
<td>Micro hydro power</td>
<td>55.83</td>
</tr>
<tr>
<td>Biogas</td>
<td>111.5</td>
</tr>
<tr>
<td>Diesel</td>
<td>125.13</td>
</tr>
<tr>
<td>Gas engine</td>
<td>78.75</td>
</tr>
</tbody>
</table>

**Source:** Zaman et al., 2020

† There is a study comparing the LCOE in the Indonesian context from various sources (see Sobok, 2020), however the version used in this study is the most detailed one.

## TABLE 5

**Total cost of electricity generation in the BAU scenario by 2030**

<table>
<thead>
<tr>
<th>Energy source</th>
<th>2019 Generation (GWh) - BAU</th>
<th>2030 Generation (GWh) - BAU</th>
<th>Total addition by 2030 (GWh) - BAU</th>
<th>Total cost of electricity generation in 2030 (US$ million) - BAU</th>
<th>Average total cost of electricity generation (US$/ GWh) - BAU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>174493</td>
<td>292825</td>
<td>118332</td>
<td>7060.85</td>
<td>24112.87</td>
</tr>
<tr>
<td>Gas</td>
<td>62319</td>
<td>64830</td>
<td>2511</td>
<td>130.06</td>
<td>2006.17</td>
</tr>
<tr>
<td>Diesel</td>
<td>10456</td>
<td>16148</td>
<td>5692</td>
<td>712.19</td>
<td>44103.91</td>
</tr>
<tr>
<td>Solar PV</td>
<td>98</td>
<td>173</td>
<td>75</td>
<td>2.94</td>
<td>16994.22</td>
</tr>
<tr>
<td>Geothermal</td>
<td>14003</td>
<td>19816</td>
<td>5813</td>
<td>242.1</td>
<td>12217.40</td>
</tr>
<tr>
<td>Hydro</td>
<td>21125</td>
<td>29103</td>
<td>7978</td>
<td>405.53</td>
<td>13934.30</td>
</tr>
<tr>
<td>Onshore wind</td>
<td>484</td>
<td>598</td>
<td>114</td>
<td>5.95</td>
<td>9949.83</td>
</tr>
<tr>
<td>Biogas</td>
<td>618</td>
<td>940</td>
<td>322</td>
<td>35.95</td>
<td>38244.68</td>
</tr>
<tr>
<td>Biomass</td>
<td>11548</td>
<td>14000</td>
<td>2452</td>
<td>160.45</td>
<td>11460.71</td>
</tr>
</tbody>
</table>

**Source:** Sobok, 2020 (modified)
In the NDC scenario, the electricity generation is simulated to be phasing out from fossil fuels, such as coal and oil. Even though the highest total cost of electricity generation by 2030 is geothermal, followed by gas and hydro power plant, the average total cost of electricity generation by 2030 will be led by onshore wind, followed by solar PV and geothermal (see Table 6). The biomass remains having the least average total cost of electricity generation. Coal and oil fuel’s average total cost of electricity generation in the NDC scenario by 2030 are not included due to phasing out from fossil fuels and thus it saves US$ 2.32 billion (see Sobok, 2020). The total cost of electricity generation by 2030, considering the 48% of RE in energy mix of NDC, will be US$ 12.69 billion.

### TABLE 6

**Total cost of electricity generation in the NDC scenario by 2030**

<table>
<thead>
<tr>
<th>Energy source</th>
<th>2019 Generation (GWh) - NDC</th>
<th>2030 Generation (GWh) - NDC</th>
<th>Total addition by 2030 (GWh) - NDC</th>
<th>Total cost of electricity generation in 2030 (US$ million) - NDC</th>
<th>Average total cost of electricity generation (US$/GWh) - NDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>176985</td>
<td>161867</td>
<td>-15118</td>
<td>-902</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>59911</td>
<td>118702</td>
<td>58791</td>
<td>3045</td>
<td>25652.47</td>
</tr>
<tr>
<td>Diesel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar PV</td>
<td>774</td>
<td>37769</td>
<td>36995</td>
<td>1458</td>
<td>38603.09</td>
</tr>
<tr>
<td>Geothermal</td>
<td>14099</td>
<td>118702</td>
<td>104603</td>
<td>4357</td>
<td>36705.36</td>
</tr>
<tr>
<td>Hydro</td>
<td>17199</td>
<td>59351</td>
<td>42152</td>
<td>2143</td>
<td>36107.23</td>
</tr>
<tr>
<td>Onshore wind</td>
<td>484</td>
<td>26978</td>
<td>26494</td>
<td>1388</td>
<td>51449.33</td>
</tr>
<tr>
<td>Biogas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td>11548</td>
<td>16187</td>
<td>4639</td>
<td>304</td>
<td>18780.50</td>
</tr>
<tr>
<td>Oil fuel</td>
<td>11294</td>
<td>0</td>
<td>-11294</td>
<td>-1413</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Sobok, 2020 (modified)*

#### 4.1.3 The potentials of RE utilisation

The current utilisation of RE in both energy and electricity sector has been underperforming (see Table 7). The biggest potential is actually solar power, followed by hydro power and wind power. However, these potentials were still limitedly utilised by only 0.04%, 6.4%, and 0.01% (Tambunan et al., 2020). This condition is arguably caused by the uncoordinated actions and misunderstandings due to lack of awareness of national targets and also sectoral interests which particularly are not bridged through consultation process in the overall policymaking horizontally and vertically (Sharvini et al., 2018).
The actors involved in the energy sector can be divided into two main groups. The first group consists of government institutions such as MoNDP, MoEF, MoEMR, MoSOE, MoF, Mol, CMfEA, and CMfMIA. The other groups consist of state-owned enterprises (such as PLN, Pertamina, and PGN), RE enterprises, IPPs, advisory institutions/NGOs, and funding managers or banks. Based on the analysis, the most powerful actor in the energy sector is MoEMR and MoEF. MoEMR is managing the governmental affairs in energy sector, while MoEF manages the calculation of GHGs emission and leads the mitigation and adaptation measures regarding the climate change. However, the relative positions of MoNDP to these two ministries are somewhat intriguing. MoNDP as the coordinator of the national planning and programming seemed to have a smaller role than it should be. This condition might show that some sectoral silos between MoNDP and the executing ministries—in this case the MoEMR and MoEF—still exist.

PLN, who is responsible for the electricity sector in Indonesia, has also conflicting roles. On the one hand, the Directorate General of Electricity in MoEMR is also the commissioner of PLN. RUPTL PLN is passed as a Ministerial Decree of Energy and Mineral Resources, meaning that the MoEMR has the authority to enact the business plan of PLN. On the other hand, PLN as a state-owned company, also answers to MoSOE. This relationship means that despite the mandate from the 1945 constitution, PLN also seeks to gain profit from the electricity sector. In other words, PLN has roles both to provide affordable electricity on one hand and to keep gaining profit.
In investment for energy sector, the affairs are under the CMfMIA. BKPM is the managing office to be the centre of investment, particularly for foreign investors. BKPM also coordinates with MoEMR regarding the investment in the energy sector. The investors can also join energy company associations, whose roles mainly focused on advocating the interests of each. While fossil fuels company associations have been established longer than that of RE companies, many RE company associations have been actively advocating for the enactment of the new feed-in-tariff policy that will be in the favour of them.

To summarise, the updated stakeholder mapping from our first-year study (see Suroso et al., 2020) can be seen in Figure 9.

**FIGURE 9**

Stakeholder mapping of the Indonesian energy sector

Source: Authors’ analysis (2021)
Based on Figure 10, it is shown that there are four categories of stakeholders in which in this research most stakeholders are categorised in the manage closely and keep satisfied category. The most important set of stakeholders are the MoEMR followed by MoF, PLN, National Energy Council, international donors, foreign investors, MoNDP, MoEF, domestic investors, Pertamina, RE developer associations. These stakeholders must be managed closely as they have important roles in making decision in the national energy sector. The second group of stakeholders has influence but with low interest in the engagement. Therefore, the engagement must be managed to keep their interest satisfied. These stakeholders are MoSOE, MoT, CMMIA, MoM, MoRT, CMEA, MoA, MoPWH, funding manager, IICB, and SKK Migas. These stakeholders should be updated regularly on the movement of national energy industry, as their feedback is highly important. The third group of stakeholders has to be kept informed on the engagement but not to be overly concerned about satisfying the interest as they tend to be the customer base of energy industry. These stakeholders are IPPs and advisory institutions. The fourth group of stakeholders are needs to be monitored but with minimum effort. In this research the identified stakeholder is PGN.
4.3 Bridging fuels and other possible transition means

Currently, the GoI is drafting the Grand Strategy of National Energy to increase national energy security and reduce dependency on energy imports. The mission behind this grand strategy is to support a more sustainable national economy, in which one of the drivers is due to the COVID-19 impact. Some strategies planned by the GoI are:

1. Increasing national crude production and acquire foreign oil fields for refinery needs;
2. Increasing the capacity of the fossil fuel refinery;
3. Optimising the utilisation of natural gas (such as gas fuel for transportation and gas for industry);
4. Increasing the use of battery-based electric motorised vehicles (BEV);
5. Accelerating the use of NRE generators (the dominance of solar power plant and other NRE sources) and optimising the production of biofuel (biodiesel or bio-hydrocarbons);
6. Increasing domestic LPG production;
7. Increasing the development of the city gas network;
8. Encouraging the use of electric stoves;
9. Developing DME, methanol, fertiliser & syngas production;
10. Building gas transmission, LNG receiving terminal, and energy buffer reserves (SPR);
11. Building electricity transmission and distribution, smart grid, off grid, and nuclear power plants as needed; and
12. Promoting efficiency, energy conservation and R&D.

Looking at the strategies, the GoI is relying on domestic fossil and coal energy to recover the national energy security. Even though it is seen as a setback towards the national NRE target, the strategies neither hinder nor detain the NRE development. Some strategies from the GoI in keeping their commitment to boost the transition of RE are:

1. An additional 38 GW of generators by 2035 to open up opportunities for renewable energy export through the ASEAN Power Grid.
2. NRE is prioritised for solar power plant with lower investment costs and more utilise domestic technologies.
3. Implementation through derivative policies of the presidential regulation on NRE pricing policy.
4. Development of biomass through forests products, agricultural waste and municipal waste.

5. The synergy of hydropower licensing to the water resources law, fees and charges, along with its land provision.

6. Construction of small-scale nuclear power plants in remote systems.

7. Revision of Ministerial Regulation of Energy and Mineral Resources on rooftop solar power plant that increased PLN’s purchase level of its adoption from 65% to 100%.

4.4 Implications of energy policy making to NDC

The GoI have planned to regulate the Grand Strategy of National Energy into a presidential or governmental level. Therefore, due to the urgency, it will most likely be regulated as a presidential regulation. This might happen because of the ease of procedure to regulate it as a presidential regulation, compares to the governmental level which demands legal confirmation from the National House of Representative that will take longer period. Although vision of the Grand Strategy is to recover the national economy, some have believed that the Grand Strategy is just another idiom from the GoI to counter the General Plan of National Energy. The most contradictive action from the government - contrasting from the existing general plan is to increase the national production of fossil fuel and coal as their first strategy. The GoI’s activities related to this strategy by 2030 are:

› Increasing the production of fossil fuel to one million barrels of oil per day.
› Acquisition of oil fields overseas.
› Proposing flexible and competitive incentive policies such as discharge adjustments, ring fencing, definite work commitments, signature bonuses, etc. that can support fossil fuel production.

Through this strategy, it is claimed to save foreign exchange of US$14.1 per year from 2021-2040. Besides fuel, other activities from the GoI to optimise coal utilisation by 2030 are:

› Optimisation of existing power plants and additional power plants by applying clean coal technology, carbon capture, utilisation & storage.
› Forbid electric steam power plant construction in Java and mine-mouth electric steam power plant for outside Java.
› Coal as a driving force for the national economy
The government hoped that through coal down streaming, it will be the main support in anticipating the shortage of domestic gas supply. Although it seems like a quick win in mitigating the slowdowns of the national economy, it will surely bring negative impacts to the national target of NDC.

4.5 Possible options and outcomes

Possible options to mitigate the risk of not achieving the NDC and NRE target accordingly within the timeframe is for all stakeholders not using BAU scheme. The possible scenarios to bolster the struggling sector depends on how the sector reimagines and reforms itself as well as on how public and private leaders address the fundamental long-term challenges facing the sector. Even though in the Grand Strategy there are options to boost up fossil and coal production domestically, renewable energy is still on the sight of the GoI which can be seen as a hope to still be on track of the NDC target. In addition, to boost Indonesia’s renewable energy sector in a post pandemic world, a study by McKinsey and Company (2020) shows that there are several measures that can be cultivated, which include:

› Promoting fair and effective tariffs through competitive options;
› Streamlining licensing and permitting processes;
› Allowing large-scale solar projects;
› Reducing procurement costs for components such as solar panels, which remain significantly higher than in other countries; and
› Rewarding renewable self-generation, such as rooftop solar-power systems.

In reviewing its energy strategy, Indonesia cannot ignore electric vehicles as well. Transportation is the third biggest contributor of GHG emissions produced from the energy sector. A study by McKinsey and Company (2020) also shows that in Indonesia, EVs are not only good for the environment but would also decrease the country’s reliance on oil. They estimated that oil imports could be cut by $100 million a year for every one million EV on roads.

4.6 Key takeaways

› Although renewables are still underutilised, the strengthening fossil fuel by the coal price index for power plant and coal reference price along with relative low average total operational cost of fossil fuel power plant will compromise the effort in achieving RE target.

› Balancing between navigating through the slowdowns of the national economy due to the COVID-19 pandemic readjustment while keeping it on track with the NDC and NRE target is quite challenging for the GoI.
CHAPTER FIVE

Investment in the Indonesian NRE sector
In this section, the investment in NRE sector will be elaborated by explaining the current state in Indonesia, followed by the policy framework, the governmental funding for NRE, and private sector in the Indonesian energy landscape. The analysis proceeds with ICF for NRE, lessons learnt from NRE investment, and barriers and challenges in the Indonesian energy sector.

5.1 Current state

Globally, under the 5% increase of global power sector investment by 2021, renewables investment for new power generation share will be around 70% of USD 530 billion where the 30% of investment is directed to grids and storage (International Energy Agency, 2021). The evolving technologies, particularly in wind power plant and solar PV, decreases the power generation cost from renewable sources. This condition also applies in Indonesia, where to fulfil the target set in RUEN 2017, the investment in RE is projected to outperform the fossil fuel investment by 2025 (see IESR and IIEE, 2019). In average, to achieve 2025 target, an annual US$ 24 billion investment in electricity sector must be met yet current fund allocation from the State Budget is just US $ 0.12 billion per year (IESR and IIEE, 2019). Hydro and geothermal power plant are among the most highly potential to attract investment, while wind power plant is one of the least (see Table 8).

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Energy Type</th>
<th>Capacity target 2025 (GW)</th>
<th>Capacity target 2025 (billion USD)</th>
<th>Capacity target 2050 (GW)</th>
<th>Capacity target 2050 (billion USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE power plant</td>
<td>Solar</td>
<td>6.5</td>
<td>5.4</td>
<td>45</td>
<td>28.7</td>
</tr>
<tr>
<td></td>
<td>Wind</td>
<td>1.8</td>
<td>2.8</td>
<td>28</td>
<td>38.3</td>
</tr>
<tr>
<td>Geothermal</td>
<td>7.2</td>
<td>19.2</td>
<td>17.5</td>
<td>52.9</td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td>5.5</td>
<td>6.7</td>
<td>26</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Mini-hydro</td>
<td>3</td>
<td>8.1</td>
<td>7</td>
<td>20.6</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>18</td>
<td>28.3</td>
<td>38</td>
<td>72.4</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>3.1</td>
<td>2.2</td>
<td>3.1</td>
<td>12.6</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>45.2</td>
<td>72.5</td>
<td>167.6</td>
<td>255.9</td>
<td></td>
</tr>
<tr>
<td>Fossil fuel power plant</td>
<td>Oil</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Gas</td>
<td>36</td>
<td>17.2</td>
<td>113.8</td>
<td>76.7</td>
</tr>
<tr>
<td>Coal</td>
<td>54.3</td>
<td>41.3</td>
<td>161</td>
<td>207.5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>90.4</td>
<td>58.6</td>
<td>275.4</td>
<td>284.2</td>
<td></td>
</tr>
<tr>
<td>Network</td>
<td>Transmission</td>
<td>1,958 (kms)</td>
<td>22.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distribution</td>
<td>50.524 (kms)</td>
<td>14.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>37.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total investment</td>
<td></td>
<td>168.3</td>
<td>540.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: IESR and IIEE, 2019
Both realised NRE investment in 2020 and investment target are still way under the investments in oil and gas, electricity, and coal and mineral (see Figure 11). Compared to other Asian countries, the average cost per megawatt of solar PV capacity is 65% higher than in India and 10% higher than in Thailand (International Energy Agency, 2020). The target investment in oil and gas sector resonates with the GoI’s high dependency on fossil fuel (Rahman et al., 2021). This is supported by the foreign investments in coal power plant, such as from China (43%), Southeast Asia (20%), and other countries (10%), where domestic investment accounts for 26% of total share during 2016 to 2019 (International Energy Agency, 2020). By 2020, the contribution from public sources and SOEs is larger in financing fossil fuel power than to renewables, where private sources accounted for around half of the funds invested (International Energy Agency, 2020). Also, the proponents of fossil fuels may use a finding from a study which states that despite lower investment cost, the coal power plant is more beneficial to the net GDP compared to the hydropower plant by IDR 15.0 trillion (Hartono, Hastuti, Halimatussadiah, et al., 2020). From a simulation, this condition may have to do with the fact that hydropower plant construction does not have a higher multiplier effect, particularly in the service sector, than coal power plant does (Hartono, Hastuti, Halimatussadiah, et al., 2020).

**FIGURE 11**

*Investment in energy sector (in IDR trillion), 2020-2021*

![Graph showing investment in energy sector (in IDR trillion), 2020-2021](source: Setiawan, 2021)
Another finding is that the development of a 1 GW geothermal or 1 GW wind power plant demands the most significant investment, followed by hydro, coal, and solar power plants, as the investment in geothermal and wind power plants will add the highest net GDP to the economy (Hartono, Hastuti, Halimatussadiah, et al., 2020). The net GDP produced by the investments in geothermal (IDR 28,007.4 billions), wind (IDR 26,590.9 billions), and hydro power plants (IDR 16,666.8 billions) is simulated to outperform that of coal investments (IDR 14,979.2 billions) which may have to do with the multiplier effects of the renewables power plant construction (Hartono, Hastuti, Halimatussadiah, et al., 2020). By utilising these comparative advantage, a support for renewables could help create high-quality jobs in areas of engineering and project finance, which can have positive effects in other parts of the energy and infrastructure sector (International Energy Agency, 2020).

5.2 **Policy framework for NRE investment**

The policy framework for NRE investment originates in the needs to streamline the private contribution to the overall Indonesian energy landscapes, including oil and gas sector. The achievement in this sector is expediting the licensing process by including selected electricity businesses—such as power plants, transmission projects and certain types of downstream oil and gas projects—in the 3-hour licensing process, which was done by June 2017. Up to September 2020, The MoEMR and BKPM succeeded in harmonising the national and regional licensing steps and requirements for electricity projects to facilitate faster implementation of independent power producer projects, as stipulated by Government Regulation 24/2018 and Ministerial Regulation of Energy and Mineral Resources 39/2018. The current market entry for investment in NRE sector along with the stakeholders in Indonesia are shown in Table 9.

**TABLE 9**

<table>
<thead>
<tr>
<th>Task</th>
<th>Government body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company registration and issuing investment licences</td>
<td><em>Badan Koordinasi Penanaman Modal</em> (Coordinating Investment Agency)</td>
</tr>
<tr>
<td>Issuing power sector licences (IUPTL)</td>
<td>› Directorate General of New and Renewable Energy and Energy Conservation, MoEMR (for the development of bioenergy, geothermal, and steam)</td>
</tr>
<tr>
<td></td>
<td>› Directorate General of Electricity, MoEMR (for renewable energy in power generation).</td>
</tr>
<tr>
<td>Off-taker</td>
<td>PLN</td>
</tr>
<tr>
<td>Fiscal incentives</td>
<td>MoF</td>
</tr>
</tbody>
</table>

**Source:** Vakulchuk et al., 2020
For foreign investors, BKPM has provided guidance for them to build power plants in Indonesia, both through open tender and direct appointment (see Badan Koordinasi Penanaman Modal, 2015). The overall stages of investment include fulfilling pre-qualification, request for proposal, submitting Letter of Intent (LoI), signing the Power Purchase Agreement (PPA), submitting financial closure/financing date, completing the procedures for Commercial Operation Date (COD), and reaching the end of contract (see Figure 12).
### Business procedure in power generation for IPPs

**Pre-Qualification**
- **Criteria**:
  - Financial Strength: Assets, Net profit
  - Technical Strength: experience in IPP development, EPC and O&M

**Request for Proposal**
- **Contains**:
  - Information For Bidders
  - Project description
  - Model Power Purchase Agreement
  - Instructions to Bidders
  - Proposal requirements
  - Evaluation Procedure

**Letter of Intent**
- **Contains**:
  - Agreed major terms & conditions
  - Agreed electricity tariff and basic formula

**PPA Signing**
- **Requirements**:
  - Performance Security Stage I, PLN’s corporate approval, MEMR tariff approval, SPC.
  - Term of the Agreement: Coal (25 years), Hydro (30 years), Geothermal (30 years), Gas (20 years)
  - Project scheme: BOO or BOT
  - Tariff and payment
  - Force majeure: natural & political
  - Government Guarantee (if applicable)
  - Termination
  - Other rights and obligations of the parties
  - Sponsors’ Agreement;

**Financial Closure/Financing Date**
- **Requirements (among other things)**:
  - Copies of: EPC Contract; policies of insurance required by the PPA; fuel supply plan; Financing Agreements; Foreign Investment approval;
  - The Legal Opinion issued for PLN;
  - The Legal Opinion issued for SELLER;
  - A copy of document(s) providing legal right to use and control over the Site
  - Performance Security Stage II

**Commercial Operation Date (COD)**
- **Requirements**:
  - Net Dependable Capacity test procedures completed.

**End of Contract**
- Transfer procedure to PLN (if applicable)

*Source:* Badan Koordinasi Penanaman Modal, 2015
Up to 2017, the GoI established an expanded financing guarantees programme including (i) credit guarantees for PLN’s Engineering, Procurement, and Construction (EPC) contracts, estimated at Rp350 trillion; and (ii) investment guarantees to private power projects. This commitment was continued by a Presidential Regulation drafting that, if passed, will act as a guiding principles for new a ministerial regulation on power purchase agreements to enhance bankability—particularly for IPPs. However, it is indicated that this Presidential Regulation will be about the regulation of electricity price from NRE sources (Kementerian Energi dan Sumber Daya Mineral, 2020b). Furthermore, Ministerial Regulation of Energy and Mineral Resources 4/2020 was passed in 2020 which removed build-own-operate-transfer provisions for electricity generation projects allowing build-own-operate to increase the bankability of IPP projects.

Besides that, the GoI also established incentives for renewable energy—geothermal development in particular—through the following measures:

1. The MoF established RE financing support schemes including to decrease project risks and enhance RE deployment via the establishment of the geothermal risk mitigation fund and the environment fund titled Indonesia Geothermal Resource Risk Mitigation Fund and Environment Fund, respectively. This financial support schemes was established by the enactment of Presidential Regulation 77 /2018, Ministerial Regulation of Finance No. 137 /PMK.01/2019 and Ministerial Regulation of Finance No. 182/PMK.05/2019).

2. The MoEMR and MoPWH issued technical regulations guiding the deployment of solar rooftop PV for PLN’s customer (through Ministerial Regulation of Energy and Mineral Resources 13/2019 and 16/2019) and floating solar in water reservoir (through Ministerial Regulation of Public Works and Housing 6/2020) to increase the share of both and thus enable large scale projects.

3. PLN also provides the guideline for the integration of RE power plant to the PLN’s distribution system by the PLN Regulation 0064.P / DIR / 2019).

These policy trajectories will be followed by the increase of power generation from renewable source to 4.8 GW geothermal capacity, 280 MW of wind capacity, at least 1 GW of solar PV, 1.4 GW of small (≤ 10 MW) hydro and 363 MW of small biomass or biogas by 2023. Also, the new regulations will lead to the deployment of least 200 MW of rooftop solar and 1 utility-scale floating solar project implemented by 2023.
5.3 Governmental funding for NRE sector

5.3.1 Subsidies for fossil fuels

Before analysing the governmental funding for NRE sector, the subsidy for fossil fuel in Indonesia must be explored. Firstly, seven out of fifteen subsidies to Indonesia’s coal industry was quantified where the subsidies to coal production was around IDR 8.5 trillion or USD 644 million in 2015, decreasing from IDR 12.5 trillion or USD 946 million (Attwood et al., 2017). These subsidies are larger than that of renewable energy development which accounted for USD 133 million in 2015, four-times increase from an USD 36 million investment in 2014 (Attwood et al., 2017). In oil sector, the subsidy is considerably oversized which takes out 5% of APBN after it has been greatly reduced (Rahman et al., 2021). In power generation sector, the combined subsidy for oil and coal outdoes that of renewable energy, as the former accounts for a total of USD 5.02 billion compared to the latter that accounts for only USD 133 million (Attwood et al., 2017; Rahman et al., 2021).

While current condition that nurtures the political and private support for fossil fuels, phasing out to renewable sources will face many hurdles, even in a condition that the price of renewables is cheaper than the fossil fuels (Rahman et al., 2021). However, a study suggests that given the scenario where the GoI puts the extra fund from phasing out as savings, a simulation gives a saving about IDR 56.2 trillion in 2020 and multiplies around four-times to IDR 213 trillion in 2050 (Hartono, Komarulzaman, et al., 2020). Furthermore, from the same study it is emphasised that the phasing out from fossil fuels if and only if followed by funds re-allocation policies into a mix of government spending, infrastructure investment, and renewable energy, will have positive impacts on the economy and the environment (Hartono, Komarulzaman, et al., 2020). Nonetheless, the political support taking form as massive investment directed to renewable energy development remains critical in achieving the RE target in energy mix (Attwood et al., 2017; Hartono, Komarulzaman, et al., 2020; International Energy Agency, 2020).

5.3.2 Plan and priority settings for renewables

Even though the development of fossil fuel power plants in Indonesia will be prohibited after 2025, there are new projects commenced and only projects having no ‘financial close’ status will be terminated (International Energy Agency, 2021; Meilanova, 2021; Winarto, 2020). Due to the lifespan of steam power plant, among others, that accounts for 35-40 years, Indonesia is predicted to operate fossil fuels up to 2060-2065 (Meilanova, 2021); then again compromising the GHGs emission reduction target set in international climate commitment.

The geography of Indonesia also gives hurdles in the grided electricity distribution, where the RE deployment in Indonesia’s main island, e.g. Java, Sumatera, and Bali, becomes less competitive than the cheap cost of coal (Halimatussadiah et al., 2020).
Thus, the development of decentralised electricity is supported in other islands and remote areas, but it is still unequally distributed. This is evident in the distribution of new RE projects that will be commenced in 2019 onwards (see Table 10). However, most of new RE projects are not highly viable (see Table 11). Furthermore, a study found that majority of feasible RE projects are located in the isolated area such as Gorontalo, Maluku, Nusa Tenggara, and some other provinces which incidentally has lower electricity rate than national average due to higher electricity generation reference price (Biaya Pokok Pembangkitan/BPP) by the high use of diesel power plants (Halimatussadiah et al., 2020).

### TABLE 10

**Distribution of new RE power plant project**

<table>
<thead>
<tr>
<th>RE sources</th>
<th>Total projects</th>
<th>Total capacity (MW)</th>
<th>Distributions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sumatra</td>
<td>Java</td>
</tr>
<tr>
<td>Biogas</td>
<td>8</td>
<td>16.9</td>
<td>74%</td>
<td>13%</td>
</tr>
<tr>
<td>Biomass</td>
<td>19</td>
<td>133</td>
<td>42%</td>
<td>5%</td>
</tr>
<tr>
<td>Mini-hydro</td>
<td>134</td>
<td>725</td>
<td>49%</td>
<td>21%</td>
</tr>
<tr>
<td>Hydro</td>
<td>32</td>
<td>2,981</td>
<td>34%</td>
<td>19%</td>
</tr>
<tr>
<td>Solar PV</td>
<td>30</td>
<td>581</td>
<td>50%</td>
<td>3%</td>
</tr>
<tr>
<td>Wind</td>
<td>19</td>
<td>1,448</td>
<td>21%</td>
<td>53%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>242</strong></td>
<td><strong>5,885</strong></td>
<td><strong>109</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

**Source:** Ministry of Energy and Mineral Resources, 2019

### TABLE 11

**Feasibility rate of new RE power plant projects**

<table>
<thead>
<tr>
<th>RE sources</th>
<th>Feasibility rate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>By number of projects</td>
<td>By capacity (MW)</td>
</tr>
<tr>
<td>Biogas</td>
<td>0 out of 8 0%</td>
<td>0 out of 17% 0%</td>
</tr>
<tr>
<td>Biomass</td>
<td>14 out of 19 73%</td>
<td>68 out of 133 51%</td>
</tr>
<tr>
<td>Mini-hydro</td>
<td>23 out of 32 72%</td>
<td>1,953 out of 2,981 66%</td>
</tr>
<tr>
<td>Hydro</td>
<td>55 out of 134 41%</td>
<td>365 out of 725 50%</td>
</tr>
<tr>
<td>Solar PV</td>
<td>0 out of 19 0%</td>
<td>0 out of 1,448 0%</td>
</tr>
<tr>
<td>Wind</td>
<td>12 out of 30 40%</td>
<td>110 out of 581 19%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>103 out of 242 43%</td>
<td>2,452 out of 5,888 42%</td>
</tr>
</tbody>
</table>

**Source:** Halimatussadiah et al., 2020

*Towards Climate Governance Model for the Indonesian Energy Sector*
5.4 Private sector in the Indonesian energy landscape

The private interests in the Indonesian energy sector can be divided into two main groups: those in the side of fossil fuels and those in favour of NRE. The fossil fuels companies are included in Asosiasi Pertambangan Batubara Indonesia/APBI (Indonesian Coal Mining Association/ICMA), Asosiasi Jasa Pertambangan Indonesia/ASPINDO (Indonesian Mining Services Association/IMSA), Asosiasi Perusahaan Minyak dan Gas Nasional (National Oil and Gas Companies Association), Asosiasi Perusahaan Pemboran Minyak, Gas dan Panas Bumi Indonesia/APMI (Indonesian Oil and Gas Drilling and Geothermal Companies Association), and Gabungan Usaha Penunjang Energi dan Migas/Guspenmigas (Energy and Oil-Gas Supporting Business Federation). For NRE sector, associations of NRE companies were also established in Indonesia (see Table 12).

**TABLE 12**

**Associations of NRE companies in Indonesia**

<table>
<thead>
<tr>
<th>Association</th>
<th>Acronym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asosiasi Produsen Biofuels Indonesia (Indonesian Biofuel Producers Association)</td>
<td>Aprobi</td>
</tr>
<tr>
<td>Asosiasi Produsen Bioethanol Indonesia (Indonesian Bioethanol Producers Association)</td>
<td>APBI</td>
</tr>
<tr>
<td>Gabungan Pengusaha Kelapa Sawit Indonesia (Indonesian Palm Oil Association)</td>
<td>Gapki</td>
</tr>
<tr>
<td>Asosiasi Panas Bumi Indonesia (Indonesian Geothermal Association)</td>
<td>API</td>
</tr>
<tr>
<td>Asosiasi Pengusaha Minihidro Indonesia (Indonesian Minihydro Entrepreneur Association)</td>
<td>APMI</td>
</tr>
<tr>
<td>Asosiasi Pengusaha Pembangkit Listrik Tenaga Air (Hydro Power Plant Entrepreneur Association)</td>
<td>APLTA</td>
</tr>
<tr>
<td>Asosiasi Industri Ethanol dan Spiritus Indonesia (Indonesian Ethanol and Spiritus Industry Association)</td>
<td>Asendo</td>
</tr>
<tr>
<td>Asosiasi Hidro Indonesia (Indonesian Hydro Association)</td>
<td>AHI</td>
</tr>
<tr>
<td>Asosiasi Energi Surya Indonesia (Indonesian Solar Energy Association)</td>
<td>AESI</td>
</tr>
<tr>
<td>Asosiasi Fabrikant Modul Surya Indonesia (Indonesian Solar Module Manufacturers Association)</td>
<td>Apamsi</td>
</tr>
<tr>
<td>Asosiasi Energi Laut Indonesia (Indonesian Ocean Energy Association)</td>
<td>ASELJ</td>
</tr>
<tr>
<td>Jejaring Mikrohidro Indonesia (Indonesian Micro-hydro Network)</td>
<td>JMI</td>
</tr>
<tr>
<td>Asosiasi Perusahaan Usaha Penunjang EBT Indonesia (Indonesian New Renewable Energy Supporting Business Association)</td>
<td>Appebt</td>
</tr>
</tbody>
</table>

*Source: IBP Inc. (2015)*

From a study conducted in 2014 (Tusk Advisory, 2014), foreign oil and gas companies own about 85.4% of the 137 national oil and gas working areas while national companies only control about 14.6% of working areas, where 8% of them held by Pertamina. The five largest foreign oil and gas companies in Indonesia are ExxonMobil, Chevron, Total, ConocoPhillips, and BP. These five major companies control 70% of the oil reserves and 80% of natural gas reserves, and have a combined production capacity of 68% for oil and 82% for natural gas (Tusk Advisory, 2014).
As to reduce the rising global temperature caused by climate change is a global commitment, many developed countries contribute to transformational change in developing countries that are having some difficulties especially in funding. International fund has been substantial in financing power generation investment in Indonesia, along with concessional debt⁶ (International Energy Agency, 2020). Based on Figure 13, many international funding sources give more attention to mitigation projects in the world with an approved funding amount of $2.904 million for 236 projects. Mitigation is defined as technological change and substitution that reduces resource inputs and emissions per unit of output. Although some social, economic, and technological policies will result in emission reductions, in relation to climate change, mitigation means implementing policies to reduce GHGs emissions and increase emission reductions.

6 Concessional debt is loans with more generous terms regarding rates (carrying no or low interest rate charges), repayment schedules, and ability to make changes during lifetime of the loan (International Energy Agency, 2020).
To accommodate international climate funding, in 2019 under the supervision of the MoF, Indonesia just launched its first fund-managing public service agency called Environmental Fund Management Agency (BPDLH). It has the capacity to gather funds domestically and internationally to support environmental conservation and management, biodiversity, and to overcome the impacts of climate change. Some efforts given from international funding to promote NRE in Indonesia after the GoI declared NDC in 2016 are shown in Table 13.

![Figure 14: Top 10 mitigation fund recipient countries in Asia](image)

**Source:** Climate Funds Update, 2020

**TABLE 13**

<table>
<thead>
<tr>
<th>Project name</th>
<th>Year approved</th>
<th>Amount (in million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asian Development Bank</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainable and Inclusive Energy Program, Subprogram 3</td>
<td>2020 (pending)</td>
<td>US$ 400.00</td>
</tr>
<tr>
<td>Sustainable Energy Access in Eastern Indonesia: Power Transmission Project</td>
<td>2020 (pending)</td>
<td>US$ 300.00</td>
</tr>
<tr>
<td>Sustainable Energy Access in Eastern Indonesia: Electricity Grid Development Program (Phase 2) Results-Based Loan</td>
<td>2020 (pending)</td>
<td>US$ 600.00</td>
</tr>
<tr>
<td>Geothermal Power Generation Project</td>
<td>2020</td>
<td>US$ 300.00</td>
</tr>
<tr>
<td>Project name</td>
<td>Year approved</td>
<td>Amount (in million)</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
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<td>---------------------</td>
</tr>
<tr>
<td>Sustainable and Reliable Energy Access Program RBL</td>
<td>2019</td>
<td>US$ 300.00</td>
</tr>
<tr>
<td>Sustainable Infrastructure Assistance Program Phase 2</td>
<td>2018</td>
<td>US$ 30.00</td>
</tr>
<tr>
<td>Sustainable and Inclusive Energy Program, Subprogram 2</td>
<td>2017</td>
<td>US$ 400.00</td>
</tr>
<tr>
<td>Pilot Carbon Capture and Storage Activity in the Natural Gas Processing Sector</td>
<td>2016</td>
<td>US$ 1.85</td>
</tr>
<tr>
<td><strong>Private Sector Operations Development</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riau Natural Gas Power Project</td>
<td>2018</td>
<td>US$ 167.90</td>
</tr>
<tr>
<td>Jawa-1 Liquified Natural Gas-to-Power Project</td>
<td>2018</td>
<td>US$ 305.05</td>
</tr>
<tr>
<td>Eastern Indonesia Renewable Energy Project Phase 2</td>
<td>2018</td>
<td>US$ 40.17</td>
</tr>
<tr>
<td>Rantau Dedap Geothermal Power Project (Phase 2)</td>
<td>2018</td>
<td>US$ 227.50</td>
</tr>
<tr>
<td>Eastern Indonesia Renewable Energy Project Phase 1</td>
<td>2017</td>
<td>US$ 120.80</td>
</tr>
<tr>
<td>Tangguh Liquified Natural Gas Expansion Project</td>
<td>2016</td>
<td>US$ 400.00</td>
</tr>
<tr>
<td>Muara Laboh Geothermal Power Project</td>
<td>2016</td>
<td>US$ 109.25</td>
</tr>
<tr>
<td><strong>Kreditanstalt für Wiederaufbau (KfW)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainable Hydropower 2</td>
<td>2017</td>
<td>€225.00</td>
</tr>
<tr>
<td>Sustainable Hydropower 1</td>
<td>2017</td>
<td>€85.00</td>
</tr>
<tr>
<td><strong>World Bank</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia Geothermal Resource Risk Mitigation Project</td>
<td>2019</td>
<td>US$ 465.00</td>
</tr>
<tr>
<td>Indonesia’s Infrastructure Finance Development</td>
<td>2017</td>
<td>US$ 8.28</td>
</tr>
<tr>
<td>Geothermal Energy Upstream Development</td>
<td>2017</td>
<td>US$ 104.00</td>
</tr>
<tr>
<td>Power Distribution Development Program</td>
<td>2016</td>
<td>US$ 1,450.00</td>
</tr>
<tr>
<td>Indonesia Energy Sector Development Policy Loan</td>
<td>2016</td>
<td>US$ 500.00</td>
</tr>
<tr>
<td><strong>Japan International Cooperation Agency (JICA)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hululais Geothermal Power Plant Project</td>
<td>2016</td>
<td>US$ 6.00</td>
</tr>
<tr>
<td><strong>New Zealand</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand support for training in Indonesian Geothermal Sector</td>
<td>2018</td>
<td></td>
</tr>
<tr>
<td>New Zealand support for accelerating geothermal development in Indonesia</td>
<td>2017</td>
<td></td>
</tr>
</tbody>
</table>
5.6 A review of investment mechanism in NRE sector: The case of The Philippines

Reflecting on other emerging countries in the renewable energy sector, Indonesia can learn from the Philippines (see Table 11 and Figure 27), as it is leading the way on environmental sustainability worldwide with the contribution of RE mix of 24.2% (Trilemma Index, World Energy Council, 2016). The country plans to increase its RE mix to 37.1% share in 2030. Regarding investment mechanisms, their government intends to implement consumer-based and investor-friendly policies coupled with four approaches driven by innovation, incentives, open market and infrastructure to achieve energy security and sustainability.

<table>
<thead>
<tr>
<th>Project name</th>
<th>Year approved</th>
<th>Amount (in million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United Kingdom</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia Renewable Energy</td>
<td>2019</td>
<td>€13.50</td>
</tr>
<tr>
<td>United States Agency for International Development (USAID)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia Clean Energy Development 2</td>
<td>2020</td>
<td>-</td>
</tr>
<tr>
<td>USAID Sustainable Energy for Indonesia’s Advancing Resilience</td>
<td>2020</td>
<td>US$ 35.00</td>
</tr>
<tr>
<td><strong>Gesellschaft für Internationale Zusammenarbeit (GIZ)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrification through Renewable Energy</td>
<td>2017</td>
<td></td>
</tr>
<tr>
<td>1,000 islands – Renewable Energy for Electrification Program</td>
<td>2017</td>
<td></td>
</tr>
<tr>
<td>Association of Southeast Asian Nations-German Energy Programme</td>
<td>2016</td>
<td></td>
</tr>
</tbody>
</table>

Source: Asian Development Bank, 2021
Regarding the electricity industry, there are four basic models for electricity industry structure that represent increasing penetration of competition in the sector:

1. **Model 1: Vertically integrated regulated utilities**
   This model operates via a geographic monopoly on selling electric power to consumers, where all the aspects of the electricity supply chain, i.e., generation, transmission, distribution and retailing, are conducted by a single utility within its region (Stăniculescu 2004; Andika & Dewanda 2004).

2. **Model 2: Single buyer model with IPPs**
   The single buyer/purchasing agency model represents a movement away from the vertically integrated model in the direction of greater competition, but the degree of increased competition varies depending on several specific design elements. Structurally, the key difference is that the VIPC (typically government-owned) diversifies its generation sources by contracting private investors (IPPs) to construct and operate generators. The IPPs sell their output to the VIPC, generally via long-term power purchase agreements (PPAs). Generally, the VIPC will continue to operate its own generators in parallel with the IPPs but will be the sole purchasing agency for wholesale electricity. Meanwhile, the VIPC will coordinate dispatch of the various generation sources and maintain the transmission network.

### TABLE 14

**Innovations and incentives in the Philippines’ NRE sector**

<table>
<thead>
<tr>
<th>Innovation Product</th>
<th>Description</th>
<th>Availability in Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV Diesel Hybrid System</td>
<td>This development of RE-diesel hybrid power systems is made to generate electricity for off-grid areas.</td>
<td></td>
</tr>
<tr>
<td>Green Bonds</td>
<td>The government has supported the issuance of a local currency bond by Aboitiz Power Corp as the first bond in Asia to be certified as a “Climate Bond”</td>
<td>v</td>
</tr>
<tr>
<td>Smart Grid</td>
<td>Smart grid for scaling up RE penetration on the grid and utilizing RE in the expansion of off-grid electrification</td>
<td>v</td>
</tr>
</tbody>
</table>

### Incentives in Philippines

- Income tax holiday
- Exemption from taxes on imported spare parts
- Tax credits
- Employment of foreign nationals
- Simplification of customs procedures

**Source:** Authors’ analysis, 2021
3. Model 3: Wholesale spot market
   The key difference between this model and the single buyer model is the existence of multiple wholesale purchasers of electricity rather than a single, central purchasing agency that commits to purchase all electricity delivered to the system.

4. Model 4: Retail competition
   The final stage in developing a competitive electricity market structure is to facilitate competition between the final suppliers of electricity to customers, i.e., retailers (Hogan, 1993).

**FIGURE 15**

*Comparison electricity market of Southeast Asian countries*

![Diagram showing comparison of electricity market models in Southeast Asian countries](source)

*Source: IMF World Economic Outlook 2014, KPMG Analysis*

Based on Figure 15, many countries are still using the single buyer model with IPPs including Indonesia. Thus, the Philippines has already adopted retail competition, establishing an open and free market of the energy sector in the region.
Regarding the infrastructure condition, there is a substantial number of publicly announced infrastructure projects to complement the already comprehensive transmission network in the Philippines, providing a broad range of investment and partnership opportunities.

With the existing supportive regulatory framework, competitive incentives, and transparent market structure, the Filipino energy sector is open for business creating a conducive investment climate. Through the Executive Order No. 30, an Energy Investment Coordinating Council (EICC) is formed and will ensure a simpler and faster process of private-sector investment. The Philippine energy sector also adopts a technology neutral policy and encourages investors to be part of the country’s energy development.

5.7 A review of investment mechanism in NRE sector: The case of Vietnam

Another country that has a growing market of RE is Vietnam. There are five factors that make RE in Vietnam expanded so quickly.

1. The investment environment in Vietnam is already conducive through the attractiveness of feed-in-tariffs and net billing mechanism, clear guidelines that relatively quickly to be implemented, and willingness to make adjustments and clarifications from the government. As in Indonesia, it is seen that PLN’s feed-in-tariffs is not that attractive from the developers’ point of view.

2. Public consultation and comment periods to be given to the government from private sector and market stakeholders. As in Indonesia, the MEMR especially under the Directorate of NRE and Energy Conservation already actively engaged with many stakeholders.

3. Alternative electricity sources are allowed to compete with the existing sources. EVN as the Vietnam’s utility, is very supportive of rooftop solar development. Whereas in the General Plan of Electricity Power Plan 2020-2029 published by PLN as the national utility, coal portion is increasing, and PLN is not too ambitious in implementing rooftop solar as an alternative source of electricity.

4. Recognition of private sector’s role in buying, selling, financing, and operating. In Indonesia, project pipeline development is still a challenge especially in finding project that is technically and financially feasible.

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5. New mechanisms and technologies become interest, as Vietnam has direct Power Purchase Agreement Pilot Program (DPPA) and large-scale floating solar PV. This direct PPA is claimed to be the most effective strategy to boost RE adoption in Vietnam, as in Indonesia the government is still struggling to actualise it.

5.8 Barriers and challenges in NRE investment

It is very common that the most challenging barriers to develop the NRE sector is that it is still perceived as a high risk and low return investment. Low return is caused by the regulation of RE pricing that is not too profitable for the IPP developer. For example, from the Presidential Regulation about NRE feed-in-tariff, Hydro Power Plant Entrepreneur Association (APLTA) criticises that instead of only hydro power plant with capacity up to 5 megawatt, the feed-in-tariff should also include those with capacity up to 20 megawatt (Andi and Handoyo, 2020). Several experts also stated that the NRE policy in Indonesia is not yet supportive to create an attractive market driven from the demand side, yet it is seen as demotivating. Aside from that, even though many companies already tailored sustainability in their business as usual, NRE installation cost is still considered as high especially in the first year of installation (see Figure 16) and there are not many options to procure NRE in Indonesia. Loan interest from Indonesia’s local banks is also the highest compared to other developing countries in Asia (see Figure 17). This implication also burdens the NRE developers from developing NRE projects. From a financial institution point of view, investing in NRE is perceived as high risk as the return is not that attractive compared to conventional energy since many NRE projects have a long payback period.
**FIGURE 16**

**Cost investment of RE**

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Bioenergy</td>
<td>2,141</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onshore Wind</td>
<td>1,473</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar PV</td>
<td>995</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**FIGURE 17**

**Interest loan of bank from Asian countries**

**Source:** IRENA, 2020 and Authors’ analysis, 2021

**Source:** World Bank, 2020
To summarise, the investment barriers and challenges in the Indonesian NRE sector include:

› Unavailability of FiT policy.

› Caps on power purchase prices that are set below renewable energy project costs (Asian Development Bank, 2020). The government caps the renewable prices according to PLN’s average electricity generation reference price for several classes of projects (Asian Development Bank, 2020; Halimatussadiah et al., 2020).

› Long procedures of NRE project licensing. Apart from the Power Purchase Agreement not referring to international standards thus causing ‘lengthy, complex, and unpredictable negotiation’ (Asian Development Bank, 2020), this also includes local manufacturing capacity still in early stages to meet local content requirements and complex tariff design (International Energy Agency, 2020).

› Banks are constrained in providing long-term lending. Some note the inexperience in funding RE projects compromising the risk analysis (IESR and IIEE, 2019).

› High interest lending rate compare to other ASEAN countries. However, though this group of risks has been declining in recent years due in part to prudent fiscal policy and strong economic growth (International Energy Agency, 2020).

› Small-medium scale of dominant NRE projects in Indonesia are not appealing by financiers. This also applies to projects with higher capital cost (Asian Development Bank, 2021).

› Lack of capacity from new NRE developers in making project’s feasibility study. Several banks also note the low quality of feasibility study of new RE projects (IESR and IIEE, 2019).

› Most RE project are supposed to electrify remote and frontier areas and funded by the government with DFI support, where the private sector plays a role mainly as a service provider and not a financier (Halimatussadiah et al., 2020).

### 5.9 Key takeaways

› The NRE development in Indonesia is still emerging and needs the intervention from the government.

› Based on the NDC roadmap in the energy sector, NRE is intended to be the first contributor for GHG emission reduction. However, the financing for NRE cannot rely on APBN since it is very limited.

› Other innovative schemes involving non-state actors are expected to be implemented for financing NRE such as International Climate Fund, BPDLH, PPP scheme, private funding, community funding, etc.
› Policy-wise, the electricity price set by the GoI (through MoEMR and PLN) is still considered low and causing investors to back down. Therefore, the innovative financing scheme needs to be supported with a better policy on feed-in-tariff.

› The involvement of actors and investors of RE investment in Indonesia comes from several sectors which are the government, private sector and business entities, financial institutions, international non-government organisation, think tank, and experts.

› A study suggests that the BAU scenario will need US$ 8.76 billion for electricity generation investment, while the NDC scenario will need US$ 12.69 billion. However, since the NDC scenario orders for 48% of RE in the electricity mix, it will save US$ 2.32 billions by phasing out from fossil fuels.
CHAPTER SIX

Conclusion and Recommendation
This study has investigated the current policies and actors' relation in the Indonesian energy sector qualitatively through key informants' interviews. Historically, this study found that the GoI’s focus in the energy sector shifted from period to period, without altering the NDC and the energy mix target. The shifting focus occurred through second tier or ministerial level policies, and oftentimes were coloured by political and economic interests. The policy-making mechanism, which still relies on lobbying and closely connected negotiation, also contributed to this situation. The lower-level policies and regulations might not synergise enough with what has been regulated at the higher-level policies. For example, an Act (Undang-undang/UU), might be translated into more flexible government regulations (Peraturan Pemerintah/PP); and a PP also could be derived onto a different path in the ministerial regulations (Peraturan Menteri/Permen).

In addition, the NDC roadmap for energy which favouring the NRE sub-sector as the main engine in GHGs emission, seemed only a simulation on a piece of paper when we found that the policies still do not take sides on the NRE investors. Overall, the national targets of NDC and energy mix will still be the priorities of each government period in the future, although the implementation details are subject to each leader. Thus, explains why the energy policies towards achieving NDC tends to be inconsistent with the roadmap.

The shifting focus on energy policies which still has quite large amount of fossil fuel rather than NRE up to 2030, for example, might also be caused by the energy trilemma situation. Looking back at the first-year result (Suroso et al., 2020), the energy trilemma consists of three key objectives of Indonesia’s energy sector which are the energy demand provision, the emission reduction, and the energy sovereignty. This is the reason why the policies and roadmap of energy transformation in Indonesia tend to be quite relaxed, which mirrored in the content of the NRE Bill draft and MoEMR Grand Strategy.

Based on the current climate governance relation in the energy sector (see Fig. 9 and 10), it can be concluded that the prominent actors in the energy sector are consistent with the job and functions (tugas pokok dan fungsi/tupoksi) for each institution. There are, however, some conflicting roles especially between MoEMR and PLN, MoNDP and MoEF, MoEMR and MoNDP, among others. In addition, the fact that several officials in MoEMR, MoEF, and PLN are former politicians or businessmen, might add to this conflicting situation. This study concludes that the current actors’ interaction is still in line with the terms of job, functions, and power constellation. To develop the ideal model, there is a need to study and analyse further the actors’ horizontal and vertical relation based on their power and network, and this would be addressed later in the third-year study.
References


Towards Climate Governance Model for the Indonesian Energy Sector


Towards Climate Governance Model for the Indonesian Energy Sector 57
Towards Climate Governance Model for the Indonesian Energy Sector


Republic of Indonesia (2016) *First Nationally Determined Contribution Republic of Indonesia*. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Indonesia%20First/First%20NDC%20Republic%20of%20Indonesia%20First%20NDC%20India%202016.pdf (accessed 20 June 2020).


Towards Climate Governance Model for the Indonesian Energy Sector


ANNEX 1: 
Interview Questions and discussion topics

A. Civil society

1. Opinion about the NDC targets and other climate commitments from the Government of Indonesia.

2. Perception on the government’s effort and policy responding climate change and energy sector.

3. Perception on the private sector’s involvement in the Indonesian energy landscape.

4. Possible barriers and opportunities in designing effective energy governance.

5. Opinion on the government’s transparency and accountability in designing Indonesian energy policy in general.

6. Opinion on the other stakeholders’ contributions in designing and achieving Indonesian energy policies.

B. Former deputy of Presidential Staff Office

1. Regardless of the energy trilemma*, how is the progress of the government towards New Renewable Energy (NRE) development?
   - That NRE bill has not been passed yet.
   - The progress on Presidential Regulation on electricity purchasing.
   - Is the focus on either geothermal, solar PV, electric vehicle, or anything else?
   - Implication to Indonesia on the NDC commitments that change along with the presidential period and political condition.
   - Advice on the NRE governance and MEMR’s grand strategy in Indonesia.

2. How the difference between civil society (urging for NRE development) and the government (still utilising coal to meet the demand) in responding to energy trilemma (energy security, environmental sustainability, and energy security) is addressed?
   - In RUPTL 2019-2028, the RE is still set only on 23% of total energy mix.
   - The Grand Strategy of Energy from MEMR is not in the same path as RUEN -- it is only effective up to 2024, hence the utilisation of coal will remain progressing.

* Energy trilemma: Have to choose between meeting the energy demand, phasing out from coal and fossil fuel, and committing to international climate pledge
C. Kemitraan (Partnership for the Governance Reform)

1. Selection of Accredited Entity (AE) / Direct Access Entities (DAE)
   › Who will vote? [chosen by the PP (Project Proponent), according to the area or field of activity that will be worked on, or directed by the NDA (BKF)]
   › When was the election held? [before the PCN (Project Concept Note) is submitted, or after obtaining a NOL (No-Objection Letter)]
   › In your opinion, by whom should the AE / DAE be selected? and why?

2. The Role of Partnership as AE / DAE in Successful NDC Target
   › To what extent is the Partnership’s role in the success of the Adaptation NDC target?
   › Did the Partnership also encourage the birth of Project Proponents to develop ideas and submit proposals (including Concept Note)? [either in its role as AE of the AF (Adaptation Fund), or in its role as DAE of the GCF (Green Climate Fund)]
   › What documents are used as references in developing Partnership programs or activities as AE / DAE?
   › Who is the target of the program or activity?

3. The role of NDA from an AE / DAE perspective
   › What are the roles of NDA in achieving NDC targets? Is it only issuing NOL?
   › What is the working mechanism of the NDA?
   › Are there things that need to be improved from the role of the NDA (BKF)?

4. Role of Ministries / Other Agencies (other than BKF / Kemenkeu)
   › The issue of adaptation is quite broad and cross-sectoral so that it requires the involvement of other Ministries / Agencies. How to coordinate? Has an approach been made to each Ministry / Agency?

D. Ministry of Energy and Mineral Resources

1. Insight on the role and contribution of the Director General of EBTK in the formulation of targets and monitoring of GHG emission reduction in Indonesia.

2. Insight from a policy perspective regarding the existence of certain national strategies in energy sector aimed at achieving the 23% NRE target

3. Insight on the extent to which the targets in RUEN and NDC are considered in the existing policy / roadmap.

4. Insight about the role and contribution of private sector in NRE sector.

5. Insight about the link between NRE development (e.g. bioenergy) with oil palm plantations and environmental issues (i.e. deforestation)
6. Insight on the possibility of reviewing national energy mix and emissions reduction targets due to pandemic.

E. Ministry of National and Development Planning

1. The program description including the program type.

2. The level of program adoption (the existence of laws, regulations, draft laws and other official documents that support the achievement of program objectives) as well as the level of program implementation (currently being discussed at the congress or being enacted).

3. The actors involved including donors, the government, and the private sector and the roles of each actor in supporting the achievement of program goals.

4. Program period (ongoing or completed).

5. The social dimensions that are affected both positively and negatively by the implementation of the program include the distribution of income and welfare, livelihoods, asset valuation, gender, rural and urban life, work culture and consumption patterns.

6. The output produced by the program is used as a basis for planning.

7. The utilising of funding opportunities from multilateral donors (including mechanisms and criteria that must be complied with)

F. Ministry of Foreign Affairs

1. Defining Official Development Assistance (ODA) in Indonesia

2. Views related to climate change issues that encourage a shift in funding previously allocated through ODA and currently entering the ICF on behalf of climate change

3. Defining International Climate Finance (ICF) in order to achieve Indonesia’s NDC targets

4. Defining Indonesia’s commitment in the mitigation sector in the form of an unconditional target of 29% and a conditional target (with international assistance) of 41% compared to the business as usual (BAU) scenario in 2030 from the perspective of International Climate Finance (ICF)

5. The existence of the Green Climate Fund (GCF) in supporting the financing of climate change actions to achieve Indonesia’s NDC targets

6. Current global developments and opportunities for Indonesia to obtain international financial support in supporting climate change action to achieve the NDC target

7. Views regarding Indonesia’s status as a developed country in relation to access to facilities and foreign soft loan facilities
8. The involvement and role of the Ministry of Foreign Affairs in the preparation and declaration of international commitments (such as the President’s Address or representing the Government at the G20 Summit in Pittsburgh in 2009)

9. Since the inception of the UNFCCC, in its negotiations, developing countries in general (including Indonesia) have always voiced about the need for Climate Change Adaptation (API) and have given far greater attention than Climate Change Mitigation (MPI). However, the reality is that the MPI issue is always superior at both the international and national levels, even though Indonesia has always spoken out and the fact is that Indonesia is quite vulnerable to the impacts of climate change. In addition, it gives the impression that Indonesia’s position depends on 'large flows from developed countries', especially when it comes to funding opportunities (even though loan funds). In this regard:

› Why is that? What are the factors that can make Indonesia’s position strong on climate change issues, especially Climate Change Adaptation (API)?

› Is the Ministry of Foreign Affairs (Dit. Development, Economy and Environment) always involved in the process of discussing and determining loans

G. Global Green Growth Institute

1. Background and description of the partnership between the Global Green Growth Institute (GGGI) and the Government of Indonesia through Bappenas, the Ministry of Finance and the Ministry of Energy and Mineral Resources in the Sustainable Green Growth, Climate and Environment Program

2. The role of Global Green Growth (GGGI) in the running of the program

3. The actors involved and the roles of each actor in the program including the national government, international donors, the private sector, etc.

4. Barriers / limitations faced and resolved in cooperation:

› Public finance,

› Capital constraints,

› Limited institutional,

› Technical capacity,

› Perceived conflict with development, etc.

5. Quality of cooperation

› Factors and conditions that contribute (can contribute) to the successful cooperation between GGGI and the Government of Indonesia
H. **Ministry of Finance**

1. **The main role of NDA in the implementation framework of the Paris Agreement?**
   - What are the policies / regulations that underlie the roles / duties and functions of the NDA, both at the international and national levels?
   - Is this BKF’s job as NDA only for funding from the GCF, or also for AF?
   - Where do the NDAs tend to be, is it more to safeguarding the global mission (through the GCF) or more towards the national interest?

2. **The Role of PKPPIM-BKF in Planning for Climate Change Funding**
   - Does the funding source managed by PKPPIM-BKF as NDA only come from the GCF or does it also deal with issues of access to funds from other sources (ODA / Overseas Development Aids)?
   - How far or how is the involvement of PKPPIM-BKF in the planning of funding carried out / coordinated by Bappenas?
   - If no, Does PKPPIM-BKF make special efforts with other DG within the Ministry of Finance in order to carry out the mandate as NDA above?
     - How to determine the amount of the budget for each K / L?
     - Have Adaptation Metrics (criteria, indicators) been used in adaptation prioritization?
     - Why did IKU / IKP appear that did not fit the ideal concept (the concept of budgeting planning is different from the concept of substance)?

3. **Role of Ministries / Other Agencies**
   - How are NDA’s efforts in encouraging Ministries / Agencies to submit proposals for international climate change funding?
   - The issue of adaptation is quite broad and cross-sectoral so that it requires the involvement of other Ministries / Agencies. How to coordinate? Has an approach been made to each K / L?
   - What are the obstacles encountered in coordinating with other Ministries / Agencies? Are the Ministries / Agencies cooperative and transparent enough?
   - What are the hopes for future improvements so that various sectors can be actively involved in achieving the NDC target?

I. **PLN**

1. The position of PLN in the Indonesian NDC and other climate commitments.
2. The interaction between PLN and other stakeholders.
3. The transition from coal in electricity sector.
4. The prospects of renewable energy in power generation.

5. The pricing/feed-in tariff policy.

J. Star Energy Geothermal

1. The position of Star Energy Geothermal in the Indonesian energy sector.
   › Relationship with MoEMR.
   › Relationship with PLN.
   › Relationship with other IPPs under geothermal energy producer association.
   › Relationship with other stakeholders (local government, think tank, NGOs, etc.)

2. Awareness of the Indonesian NDC and other climate commitments.
   › To what extent have they influenced the business model of your organisation?
   › Is there any contribution to the policy making process?

3. Barriers as an independent power producer (IPP) and perspective on PLN’s centralized market in the industry, including the competition among the private sector to the geothermal industry.
   › Licensing process.
   › Bankability.
   › Description of competition landscape.

4. Opinion/perception on geothermal development compared to solar PV from a market-based perspective and/or government’s perspective.
   › Confirm and probe into the competition with other forms of renewables.

5. Opinion/perception on the most potential renewable energy sources in power generation.
   › Is there any influence from the international community in shaping this perception?
   › To what extent does the government show that a certain RE development is feasible?

6. The pricing/feed-in tariff policy changes in MEMR 50/2017 to MEMR 4/2020 and its implications in enabling the environment of the renewables industry for the private sector.
   › Have they been invited to the discussion/meetings? To what extent have they influenced the FIT policy making?
   › What leverages/downplays the roles of the private sector?

7. Advice and opinion on NRE governance and MEMR grand strategy in Indonesia.
ANNEX 2:
The pros-cons of Job creation Act and possible implications in the Indonesian energy sector

The Job Creation Act was passed on 2 November 2020 as Law 11/2020 with aims to simplify bureaucratic mechanism in investment, synchronising national and subnational policies in investment for job creation, and provide a legal certainty for the Indonesian citizens and a legal protection for policymakers (Direktorat Publikasi Ilmiah dan Informasi Strategis IPB University, 2021). However, many controversies arose before the enactment of the Act.

The first controversy is the adoption of omnibus bill in the Indonesian legal system. Omnibus bill is a single legal document that is accepted in a single vote by a legislature but packages together several measures into one or combines diverse subjects, meaning that it can repeal several passed regulations. Passing an omnibus bill is new in Indonesia, where many Anglo-Saxon countries previously practicing common law has this type of bill. In the Indonesian legal system, there is Law 12/2011 on the Formation of Law Regulation (Undang-Undang Nomor 12 Tahun 2011 tentang Pembentukan Peraturan Perundang-Undangan) designated to classify the regulation in a hierarchical regulation (see Figure 30). The Job Creation Act is a national bill (undang-undang) yet it updates many important policies, such as Labour Act (Undang-undang Nomor 13 Tahun 2003 tentang Ketenagakerjaan), Building Act (Undang-undang Nomor 28 Tahun 2002 tentang Bangunan Gedung), and Land Acquisition for Public Interest Act (Undang-undang Nomor 2 Tahun 2012 tentang Pengadaan Tanah bagi Pembangunan untuk Kepentingan Umum), among others (Disnakertrans NTB, 2020; Rizki, 2021; Saputra, 2020). Based on the law doctrine ‘lex posterior derogat legi priori’, the younger law (Job Creation Act) overrides the older law. The law doctrine ‘lex specialis derogat legi generalis’ also applies in the same situation, where the Job Creation Act also governs more specific matters than the predecessors aforementioned. However, by the same doctrines, the Law 12/2011 should be amended or updated first to give the Indonesian legal system a capacity to pass the omnibus bill.
The second controversy is the relatively short Job Creation Act consultation process. This process resulted in many technical and administrative mistakes, that is considerably dangerous regarding to the status of the Act being an omnibus bill (Amindoni, 2020). Despite the 1000-pages draft, the non-substantial review after the bill was approved by the Legislative Body of House of Representatives (Badan Legislasi DPR) in only two days before the bill was passed (Thomas, 2020b). For a comparison, a normal non-substantial review took two weeks until a month, considering the contents’ complexity (Thomas, 2020b). The plenary meeting (rapat paripurna) agenda for Job Creation Act was not transparent, as several members of parliament were given the invitation only hours away from the meeting. During the plenary meeting, two out of nine party factions (Democrat Party and Prosperous Justice Party) walked out given the condition of the plenary meeting that is deemed procedurally flawed and thus neither accountable nor transparent (CNN Indonesia, 2020b).

The third controversy is the substance that the Act regulates. While Job Creation Act focus mainly on creating jobs and utilising the Indonesian workforce, many criticise the Act for its possible bad impacts on the environment.
A policy brief identifies five major issues inflicted by the Job Creation Act: the degradation of Environmental Permit (Ijin Lingkungan), the deletion of public participation in the Environmental Impact Assessment (Analisis mengenai Dampak Lingkungan/Amdal) application, the lessened legal consequences in environmental law breach, the forestry area utilisation, and the spatial planning\(^1\).

As the Job Creation Act regulates the simplified investment mechanism, Building Permit (ijin Mendirikan Bangunan/IMB) is repealed and changed by Building Approval (Persetujuan Bangunan Gedung/PBG). Furthermore, unlike the role of local government (Pemerintah Daerah/Pemda) in issuing Building Permit, Building Approval is issued by the national government, signalling its centralistic role in directing investment (Saputra, 2020). Previously, Building Permit is considerably difficult to be issued as the required documents include tax document, but most importantly, the notification letter to local residents describing the potential impacts of the project during and after construction and the measures to mitigate those impacts. This notification letter signifies the acceptance of local residents towards the construction project. The next bad impact is the change of Environmental Permit issued by the local government into the Environmental Approval (Persetujuan Lingkungan) issued by the national government (Taher, 2020). The consequences include the formation of new agency in the national government to review the Environmental Impact Assessment application, instead of the subnational government whose administration area is affected by any project (Taher, 2020). The next consequence also includes the lost opportunity to contest any Environmental Permit deemed troublesome in Administrative Court (Pengadilan Tata Usaha Negara/PTUN) (Amali, 2020). This consequence is predicted to compromise the environmental protection efforts by lessening the legal consequences of a law breach.

In the energy sector, the Job Creation Act gives MoEMR the authority to simplify the permitting application (Kementerian Energi dan Sumber Daya Mineral, 2021b). This decision signals the support towards investment in energy sector. However, one may argue that this decision also opens the opportunities for the fossil fuels investors to invest in Indonesia, primarily due to the centralistic investment mechanism regarding the Job Creation Law (Thomas, 2020a). Currently, there are also 51 new regulations that operationalise the Job Creation Law, taking form as a Government Regulation or a Presidential Regulation (Astutik, 2021). However, further studies need to be done to investigate the extent of which that the Job Creation Law has caused.

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\(^1\) These issues were raised in a limited discussion with experts in the spatial planning, climate change, environmental law, and environment, held by the Climate Change Center of Bandung Institute of Technology on 26 November 2020.