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The Role of the Government of West Java in the Implementation of the New and Renewable Energy Program Based on the Glasgow Climate Pact

Peran Pemerintah Jawa Barat dalam Implementasi Program Energi Baru dan Terbarukan Berdasarkan Pakta Iklim Glasgow

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Abstrak: *COP26 yang dilaksanakan di Glasgow, Skotlandia telah mendorong komitmen negara-negara di dunia yang hadir pada pertemuan tersebut untuk merealisasikan ambisi dunia dalam menekan angka peningkatan suhu bumi di batas 1,5°C. Salah satu solusi yang digemakan pada pertemuan tersebut adalah transisi penggunaan energi menuju energi baru dan terbarukan (EBT). Dalam mewujudkan komitmen tersebut maka Indonesia perlu mengidentifikasi sebaran peran dan kontribusi pemerintah daerah agar dapat membantu pencapaian target RUEN (Rencana Umum Energi Nasional) melalui RUED (Rencana Umum Energi Daerah). Dengan menggunakan pendekatan deskriptif-kualitatif, penelitian ini bertujuan untuk menjelaskan bagaimana peran pemerintah Jawa Barat sebagai pemerintah daerah dalam implementasi Pakta Iklim Glasgow. Penelitian ini merekomendasikan kepada DPR RI melalui fungsi pengawasan untuk mendorong distribusi peran pemerintah daerah dalam implementasi EBT melalui empat komponen penting: integrasi regulasi pemerintah pusat dan pemerintah daerah, penyederhanaan birokrasi antara pemerintah daerah dan pemerintah pusat dalam perwujudan EBT, optimalisasi distribusi anggaran dan pembiayaan EBT, serta optimalisasi screening dan monitoring implementasi EBT pemerintah daerah. Dengan demikian, keterlibatan peran pemerintah Jawa Barat dalam mendukung percepatan target RUEN pada implementasi program EBT dapat terwujud secara optimal.*

Kata kunci: *energi baru dan terbarukan; Pakta Iklim Glasgow; RUED*

Abstract: COP26 in Glasgow, Scotland, has encouraged the commitment of the countries in the world that were present at the meeting to realize the world's ambitions in suppressing the increase in the Earth's temperature to the limit of 1.5°C. One solution echoed at the conference was transitioning from energy use to new and renewable energy (NRE). In realizing this commitment, Indonesia needs

to identify the distribution of roles and contributions of subnational governments so that they can help achieve the RUEN (National Energy General Plan) target through RUED (Subnational Energy General Plan). Using a descriptive-qualitative approach, this study aims to explain the role of the West Java government as a subnational government in implementing the Glasgow climate pact. This study recommends to the Indonesian House of Representatives, through its oversight function, to encourage the distribution of the role of subnational governments in the implementation of new and renewable energy (NRE) through four essential components: integration of national and subnational government regulations, simplification of the bureaucracy between subnational governments and the national government in the realization of NRE, optimizing NRE budget distribution and financing, as well as optimizing screening and monitoring the implementation of NRE in subnational governments. Thus, the involvement of the role of the West Java government in supporting the acceleration of the RUEN target on the implementation of the NRE program can be realized optimally.

Keywords: Glasgow Climate Pact; new and renewable energy; RUED

Introduction

The increase in Earth's temperature over the years has led to ecosystem imbalances (United Nations Framework Convention on Climate Change [UNFCCC], 2021a) and caused significant climate changes and crises, such as the floods that occurred in July 2021 in Belgium and Germany that have claimed hundreds of lives (Levin et al., 2021). The situation could worsen as the Earth's temperature rise is predicted to reach 4.4°C by 2100 ("PCC, 2021: Summary for Policymakers," 2021, p. 14). If this happens, worse impacts and disasters will be felt ("Penyebab dan dampak," 2022).

COP26 in Glasgow in 2021 issued the Glasgow Climate Pact, with one of its goals being to limit the Earth's temperature increase to 1.5°C, as outlined in the 2015 Paris Agreement (UNFCCC, 2015). The Glasgow Climate Pact focuses on three key points: adaptation, mitigation, and funding. One proposed solution to reduce the use of fossil energy is the transition from fossil energy to new and renewable energy (NRE) sources (COP26, 2021).

As a country that predominantly uses fossil energy over NRE (Azhar & Satriawan, 2018), Indonesia's commitment to the Glasgow Climate Pact can be observed through several policies. These include changes from Indonesia's nationally determined contribution (NDC) in 2016 to its NDC in 2021, responses to five COP26 agendas (scaling-up adaptation, keeping 1.5°C alive, addressing loss and damage, finalizing the Paris Rulebook, and mobilizing finance), and the issuance of Presidential Regulation No. 11 of 2023 on Additional Concurrent Government Affairs in the Energy and Mineral Resources Sector in the Renewable New Energy Sub-field. Presidential Regulation No. 11 of 2023 explains that optimizing coordination and strategic authority between the national government and subnational governments is necessary to help Indonesia achieve its contribution to reducing global emissions (Direktorat Jenderal EBTKE, 2023).

According to Siti Nurbaya, the Minister of Environment and Forestry of Indonesia, cooperation and coordination from various sectors are required, including the involvement of subnational governments in achieving the NDC (Anugrah, 2021a). Research by Reisinger et al. (2011) concluded that subnational government has an essential role in accelerating climate change, namely (1) raising public awareness of climate change; (2) engaging and developing local expertise of professionals and deci-

sion makers by presenting climate change science, scenarios and their uncertainties in a locally relevant context and through interactive workshops; (3) adopting a sequential approach to assessing risks and identifying vulnerabilities in the context of socioeconomic pressures and other specific locations; and (4) getting support from the national government through regulations and guidance materials. Later, Deri, and Alam (2008) explained that the role of subnational governments in climate change has a significant impact on the elements of mitigation and adaptation, including combining spontaneous (based on local wisdom) and planned (based on scientific thinking) adaptation strategies, strengthening and improving the capacity of subnational governments in responding to climate change effectively including human resources, skills, knowledge, planning, and negotiation capabilities of individuals and communities. Furthermore, they also emphasized that effective climate change mitigation can only be done if subnational governments are involved in regulatory and technical national-scale plans.

Chelminski's research (2022, p. 149) reveals a significant challenge for Indonesia in implementing geothermal development policies—the limited capacity of institutions, notably the subnational government's enforcement abilities. The Indonesian House of Representatives plays a crucial oversight role in encouraging and distributing responsibilities among subnational governments to meet the RUEN 2025–2050 targets for NRE program implementation. Recognizing the involvement of subnational governments as key players is vital to the Indonesian House of Representatives' oversight function. This recognition ensures that the technical capacities of subnational governments are optimally utilized to accelerate the achievement of national energy transition policy targets through impactful subnational policies (Direktorat Jenderal EBTKE 2022a).

The West Java Government is committed to realizing Indonesia's NDC based on the Provincial General Energy Plan (RUED-P) by accelerating the NRE program. According to West Java Provincial Regulation No. 2 of 2019, West Java is committed to becoming an independent province in building energy security and availability, including accelerating the NRE program. Therefore, the problem formulation in this study focuses on the role of the West Java government in implementing NRE based on the Glasgow 2021 Climate Pact. The study aims to provide an overview of the importance of distributing the role of subnational governments in realizing the NRE program in alignment with Presidential Regulation No. 11 of 2023.

This research uses the descriptive-qualitative method by using secondary data on the implementation of the NRE program from (1) the Energy and Mineral Resources Agency of West Java Province, (2) the Ministry of Energy and Mineral Resources, Directorate General of New Renewable Energy and Energy Conservation, as well as (3) journals and research that discuss the implementation of NRE program in Indonesia and (4) the role of the subnational government in realizing NRE program. The mapping in this study is carried out based on the latest Indonesian NDC after the ratification of the Glasgow Climate Pact and West Java RUED-P 2018–2050. The role of the subnational government in implementing NRE programs is identified based on Presidential Regulation No. 11 of 2023 and indicators of the subnational government's role in NRE projections, as outlined by the Indonesian Ministry of Energy and Mineral Resources. To analyze the contribution of the West Java government in supporting the realization of RUEN 2025–2050, Albert Humphrey's SWOT analysis is also applied to explain the opportunities and constraints faced by the West Java provincial government in accelerating the NRE program.

Glasgow Climate Pact

The Glasgow Climate Pact is an outcome of integrating countries' agreements to limit the increase in Earth's temperature. One of the efforts is promoting environmental improvement by transitioning fossil energy to renewable energy (Esmaeili Shayan et al., 2022). There are two goals in utilizing the renewable energy transition: achieving optimization of renewable energy use and strengthening democracy (Winanti et al., 2021). This can be seen from the five sessions of the COP26 agenda, such as scaling up adaptation, keeping 1.5°C alive, loss and damage, finalizing the Paris Rulebook, and mobilizing finance (Anugrah, 2021a). COP26 is expected to enhance understanding of global goals on climate change adaptation and climate resilience based on energy democracy (UNFCCC, 2021b). It became the middle bridge between the state, society, and the transformation towards renewable energy (Szulecki & Overland, 2020).

COP26 also emphasizes four main agendas. First, it agreed on commitments to reduce greenhouse gas emissions. Second, it strengthened adaptation to deal with the impacts of climate change. Third, it focused on the mobilization of funds for climate action. Fourth, it aimed to enhance international cooperation to accelerate the energy transition and promote green vehicles (Indikator, 2021). The Glasgow Climate Pact discusses three main points: adaptation, mitigation, and funding (UNFCCC, 2021c). The pact addresses four specific commitments: (1) maintaining an ideal global temperature of a maximum of 1.5°C as a commitment to encourage action and efforts towards net-zero emissions (NZE); (2) ensuring global adaptation efforts to the impacts of climate change for global citizens and natural habitats to adapt; (3) mobilizing USD100 billion per year by 2020 as a form of accountability and commitment of developed countries to fund adaptation and NRE technology transfer in developing countries; and (4) collectively realizing the Paris Agreement by encouraging all entities, including states, businesses, non-governmental organizations, the private sector, civil society, and citizens (Larasati et al., 2020).

The Glasgow Climate Pact has been signed by 195 countries in attendance (CNN, 2021) and commits to "phasing down" the use of fossil fuel energy and replacing it with renewable energy (Anugrah, 2021b). The Glasgow Climate Pact has comprehensively committed to Articles 6 and 13 of the Paris Agreement related to the Paris Rulebook implementation guidelines (Madani, 2021). Indonesia views the Glasgow Climate Pact as a commitment of financial support to developing countries in achieving the NZE target by 2030 (KEMLU, 2021). According to the Ministry of Finance, Indonesia needs at least IDR3,779.63 trillion in accumulative funding or an annual average state budget of IDR266.3 trillion to achieve the target (Nawawi, 2022). Energy and transportation have the most significant portion, 92% or IDR3,500 trillion of the total accumulative funds needed (Larasati et al., 2020).

In addition to funding, through the Ministry of Environment and Forestry (MoEF), Indonesia also responded that to achieve net zero FoLU (forest and other land uses), deforestation must be controlled and kept as low as possible (MENLHK, 2021). Indonesia's active response has also increased subnational climate and energy policies, including subnational governments (Indonesia Green Growth Program, 2021a).

Indonesia's Response to 5 Agenda Items of COP26 Glasgow Summit

The formulation of NRE business policies designed by the government must meet sustainable development goals, including renewable energy, ecosystems, and community welfare (Putri et al., 2022). Therefore, Indonesia needs to translate the five agendas of the COP26 Glasgow Summit into concrete responses. First, Indonesia views

climate change adaptation as crucial as mitigation to improve adaptation. In this topic session, Indonesia has prepared an updated NDC explaining the climate change adaptation roadmap until 2030 (Anugrah, 2021a). Indonesia needs to pay attention to the fact that the adaptation of this energy transition must be related to welfare, which can be seen from three dimensions: economic, social, and environmental (IRENA, 2016).

Secondly, regarding the session on keeping the 1.5°C agenda alive, Indonesia, through the MoEF, emphasized that Indonesia strongly supports this agenda with the initiative of the "Indonesia FoLU Net-sink 2030" target (Anugrah, 2021b). The target comes with an operationalization manual that aims for supervision and control. In its implementation, this target considers three main priority sectors: forestry, energy, and transportation (Hariyadi, 2021). Implementing the 2030 FoLU Net-sink target is carried out by accelerating NRE with world cooperation, such as targeting phasing out of coal-fired power plants and replacing them with renewable energy (Larasati et al., 2020).

Third, in the loss and damage agenda session, Indonesia considers that establishing the Santiago Network for Loss and Damage (SNLD) can mediate between developed and developing countries in providing technical assistance, such as preventing and mitigating loss and damage from climate impacts. SNLD has three important elements -purpose, operationalization, and function of SNLD for developing countries- and underlines four important things -integration of relationships (SNLD–Paris Agreement), flexibility and synergy (SNLD–experts) in issuing technically appropriate and practical assistance in the field, support of disaster and risk reduction and humanitarian communities to the functions of SNLD, and finally, improving the functions of SNLD towards coordination and actor relations in assistance and means of implementation (Larasati et al., 2020).

Fourth, finalizing the Paris Rulebook, Article 6. In the fourth agenda session, Indonesia proposed six proposals, namely (1) implementing NDC achievements by increasing ambition and cooperation approaches, including funding based on TACCC (transparent, accurate, complete, comparable, consistent); (2) using the right methodology in preparing baselines and reports with corresponding adjustments to avoid double claiming; (3) transitioning CDM activities to the Article 6 mechanism. 4 mechanisms if it meets eligibility; (4) use SoP (share of proceeds) in the form of adaptation fund to provide funds; (5) encourage non-market mechanisms under Article 6.8 of the PA; (6) adopt Article 6 at COP26 to increase the ambition of NDC implementation to the 1.5°C limit (Larasati et al., 2020).

Fifth, financial mobilization. Indonesia emphasizes that funding from developed countries is needed to implement the NDC, including technology transfer, and accelerating the capacity of developing countries is very important in achieving the NDC target (Hariyadi, 2021). The assistance is expected to become long-term climate finance so that it can provide easy access to developing countries, and the cooperation of countries in the world in achieving global targets can be realized with the achievement of NDC (Larasati et al., 2020).

Nationally Determined Contribution Indonesia 2021: Indonesia's Policy Commitment to the Glasgow 2021 Climate Pact

The COP26 summit agenda has influenced some differences in Indonesia's NDC between 2016 and 2021. Figure 1 is the updated Indonesia NDC infographic.

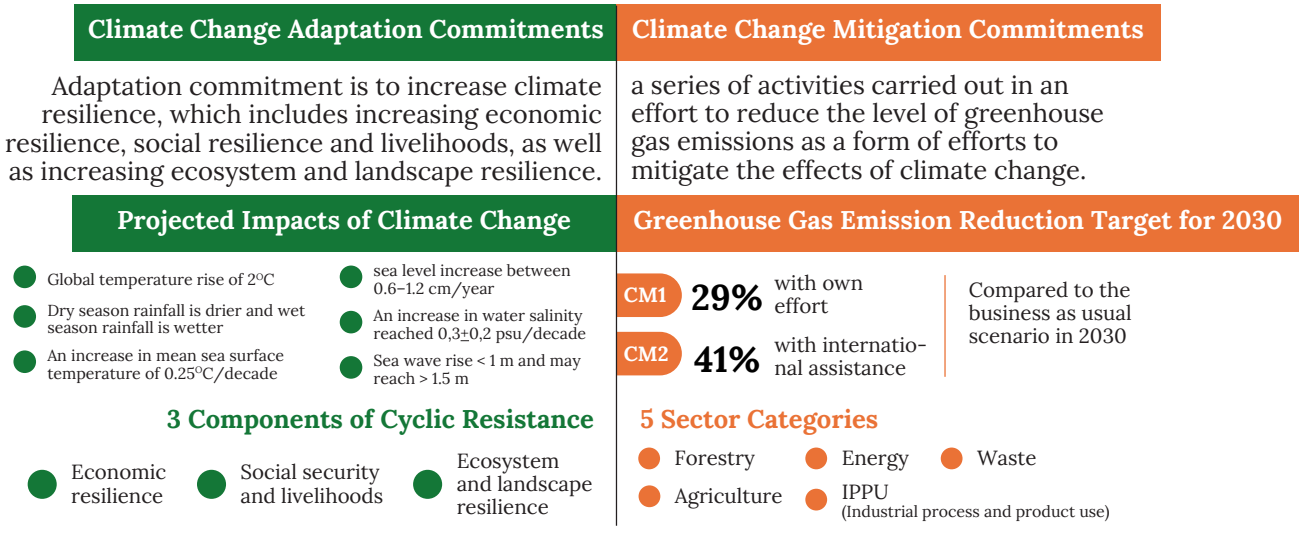
Based on Figure 1, Indonesia has two commitments in implementing the Glasgow Climate Pact: climate change adaptation and mitigation. Indonesia has three main

climate resilience components in the climate change adaptation commitment: the economy, social and livelihoods, and ecosystems and landscapes. In the climate change mitigation commitment, Indonesia targets to reduce greenhouse gas (GHG) emissions by 29% with its own efforts and 41% with international assistance by 2030. The mitigation effort involves five sector categories: forestry, energy, waste, agriculture, and IPPU (Indonesia Green Growth Program, 2021a). In terms of energy, renewable energy sources are resources that can be utilized repeatedly or infinitely (Casper, 2010).

The 2016 NDC is based on Law No. 16 of 2016 on the Ratification of the Paris Agreement to the UNFCCC. Indonesia's NDC target in 2016 was 29% with its efforts and 41% with international assistance (MENHLK, 2016). The target can be achieved by reducing greenhouse gas emissions in five sectors, namely forestry (17.2%), energy (11%), agriculture (0.32%), industry (0.10%), and waste (0.38%) (Masripatin, 2017). The 2021 NDC has significant changes, such as an increase in ambition in GHG emission projections, refinement of long-term strategy documents, translation of the Katowice Package, explanation of BAU projections, commitments in various international agreements, and adjustments to the RPJMN and Vision Indonesia. In addition, Indonesia's updated NDC also names three sectors as sectors that contribute greatly to achieving GHG emission reduction targets, including forestry, energy, and transportation.

Based on Table 1, in the updated NDC, the forestry sector can contribute 24.1% or around 692 metric tons of carbon dioxide (Mton CO2e), while energy contributes 15.5% or 446 Mton CO2e (Jati, 2021). The ambitions for the transformation of the energy supply mix in 2025 and 2050 based on Government Regulation No. 79 of 2014 on the National Energy Policy are as follows: (1) the use of renewable energy reaches 23% in 2025 and 31% in 2050; (2) the reduction of fuel oil energy use below 25% in 2025 and 20% in 2050; (3) the use of coal with a minimum amount of 30% in 2025 and 25% in 2050; (4) the use of gas with a minimum amount of 22% in 2025 and 24% in 2050 (MENHLK, 2016).

Based on Figure 2, it can be explained that in 2025, 400 MTOE (million tons of oil equivalent) will consist of 30% coal, 22% natural gas, 25% oil, and 23% renewable energy. In 2050, RUEN targets 1,000 MTOE consisting of 25% coal, 24% natural gas, 20% oil, and 31% renewable energy (Lestari, 2021). From this target, Indonesia's ambition to realize the concrete actions of the Glasgow Climate Pact can be seen in the



Figur 1. Infographic of Indonesia's Updated NDC
Source: Greengrowth Bappenas RI (September 23, 2021).

Table 1. Differences between Indonesia's 2016 and 2021 NDCs

Topics	NDC 2016	NDC 2021
Alignment with the national strategy	Nawa Cita Concept	RPJMN 2020–2024 and Indonesia's Vision 2045 through NDCs
Projected GRK emissions under BAU	Energy CM2: 1.271Mton CO2e FOLU CM2: 64 Mton CO2e Emission reduction target Energy CM2: 398 Mton CO2e FOLU CM2: 650 Mton CO2e	Energy CM2: 1.407 Mton CO2e FOLU CM2: 68 Mton CO2e Emission reduction target: Energy CM2: 441 Mton CO2e FOLU CM2: 692 Mton CO2e
Long Term Strategy (LTS) document	None	Available - including gender equality and decent work issues as per Paris Agreement Article 4.19
Explanation of assumptions in business as usual (BAU) and target projections	None	Available
Indonesia's commitment to various international conventions	None	Available
Translation of the Katowice Package as Guidelines for the implementation of the Paris Agreement	None	Translated

Source: Genny Jati, Institute for Essential Service Reforms (October 6, 2021).

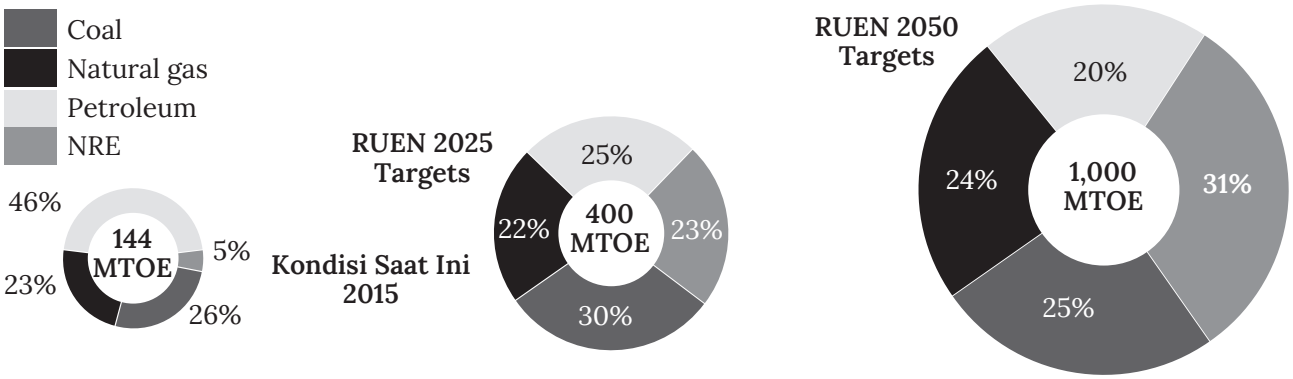


Figure 2. National Primary Energy Mix Target, 2025–2050
Source: Lestari (2021).

proportion of the NRE target, which continues to increase to 23% in 2025 and 31% in 2050. Likewise, Indonesia's commitment is to reduce fossil energy use gradually - coal will be 25% below the use of renewable energy in 2050.

DG PPI MoEF believes that the involvement of subnational government roles as a subnational sector is crucial in achieving NDC targets (Indarpuri, 2017). In accordance with Government Regulation No. 79/2019 on the National Energy Policy, the Ministry of Energy and Mineral Resources has agreed to encourage efforts to reach 23% in the use of renewable energy by 2025 (Pribadi, 2021a). However, compared to data from ESDM in 2019, as shown in Figure 3, Indonesia has only utilized the NRE sector by 9.15% and still needs another 13.85% to reach the NRE ambition target in 2025 and 21.85% in 2050 (Lestari, 2021).

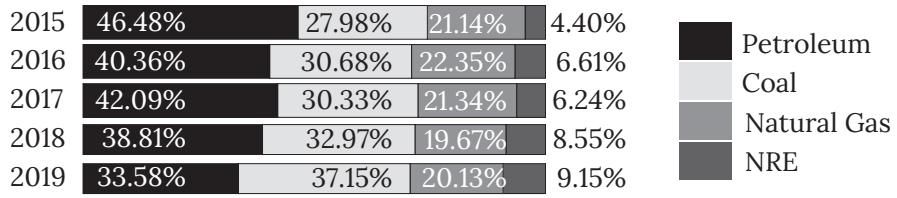


Figure 3. Percentage of National Primary Energy Mix, 2015–2019
Source: Kementerian Energi dan Sumber Daya Mineral Republik Indonesia (2021).

The Ministry of Energy and Mineral Resources has four main programs in the energy sector to reach 23% renewable energy and achieve Indonesia's NDC: (1) the B30 mandatory program, blending 30% biodiesel and 70% diesel fuel oil as a supply of biofuel companies; (2) the biomass co-firing program, a method of utilizing biomass as a substitute for coal in PLTU; (3) the acceleration program for the construction of PLTS (solar power plants); and (4) the program for switching PLT to PLT NRE (Pribadi, 2021b). The target of PLT NRE is 905.73 megawatts (MW), which includes geothermal power plants (196 MW), hydropower plants (557.93 MW), solar power plants (138.8 MW), and bio power plants (13 MW) (Pribadi, 2021b). In line with the target of achieving 23% NRE in 2025 based on the Ministry of Energy and Mineral Resources (Kementerian Keuangan, 2022), NRE investment has also increased, reaching USD2.05 billion or around IDR28.9 trillion. In addition, increasing the capacity of subnational governments by socializing the results of COP26 and national reporting is needed (Permana, 2021).

The implementation of the 2021 NDC also requires inclusive multi-sector cooperation so that the 2021 NDC targets can be fully understood both contextually and practically by party stakeholders (national government and related ministries) and non-party stakeholders (subnational governments, private sector, research institutions, and civil society) (Indonesia Green Growth Program, 2021b).

Presidential Regulation No. 11 of 2023: Indonesia's Commitment to Involve Subnational Governments in the Implementation of NRE

Indonesia's commitment to involving subnational governments to achieve the RUEN 2025–2050 targets can be seen from the Presidential Regulation (Perpres) on the Division of Government Affairs in the Field of Energy and Mineral Resources (ESDM) in the NRE Sub-field (Laia, 2022). On January 26, 2023, Presidential Regulation Number 11 of 2023 on Additional Concurrent Government Affairs in the Field of Energy and Mineral Resources in the NRE Sub-field was finally issued as a form of government attention involving the role of subnational governments in the implementation of NRE (Direktorat Jenderal EBTKE, 2023). This regulation allows government institutions or agencies to perform government task (Arsita et al., 2021). However, the utilization, management, and control of energy resources, including the NRE transition, are fundamental aspects of a country (Redi & Marfungah, 2021).

Presidential Regulation No. 11 of 2023 consists of 7 articles. In Article 3, Perpres No. 11 of 2023 discusses the authority of the national government in the implementation of the NRE program, which includes recommending geothermal business activities, managing the provision of fuel through the utilization of biomass and/or biogas across provinces, managing various NRE; organizing energy conservation in activities issued by the national government permit, as well as energy conservation in facilities and infrastructure administered by the affairs of the ESDM sector; fostering and

supervising the implementation of energy conservation at the national and subnational levels.

Furthermore, Article 4 of Presidential Regulation No. 11 of 2023 explains the authority of subnational governments in the implementation of the NRE program, which includes managing the availability of fuel through the utilization of biomass and/or biogas in the provincial area; managing various NRE in the provincial area; managing Conservation Energy in activities issued by provincial permits and Energy Conservation in facilities and infrastructure managed by subnational apparatus organizing affairs in the field of ESDM; fostering and supervising the implementation of Energy Conservation at the provincial level.

Along with Presidential Regulation No. 11 of 2023, the authority of the subnational government in implementing NRE as one of the efforts to realize the RUEN 2025–2050 target is essential. This also applies to the role of the West Java provincial government. This role can be taken in reference to the RUED-P in accordance with Presidential Regulation No. 11 of 2023 Article 5.

Subnational Energy General Plan (RUED) of West Java Province 2018–2050

The West Java Provincial RUED aims to be the basis of West Java government policy in optimizing the energy sector to achieve independence in energy management and supply in West Java in an efficient, integrated, and sustainable manner (West Java Provincial Regulation Number 2 of 2019 regarding the Regional Energy General Plan of West Java Province for the period 2018–2050, 2019). The West Java Province RUED has several main targets, including 20% use of renewable energy in 2025 and 28% in 2050, while fossil energy such as coal reaches 24% in 2025 and 30% in 2050 (Pamungkas, 2021).

Based on the data in Figure 4, the Government of West Java is trying to integrate the target with RUEN, namely increasing the realization of the NRE target to 20% in 2025 with a total of 52 MTOE consisting of 28% oil, 28% gas, 24% coal, and 20% NRE. In 2050, the increase will occur at 138 MTOE with 30% coal, 28% NRE, 24% natural gas, and 16% oil (Dinas ESDM Jawa Barat, 2017). In addition to the energy supply and NRE mix, the RUED of West Java Province also outlines several other targets, such as a power generation target of more than 78 GW with a capacity of more than 5000 (4768 KWh). To achieve the RUED target in the NRE sector, West Java still has to increase 10% to reach the target of 20% in 2025 and 18% in 2050. Renewable energy produces less pollution than fossil-based energy (Liu et al., 2017). Renewable energy should be a

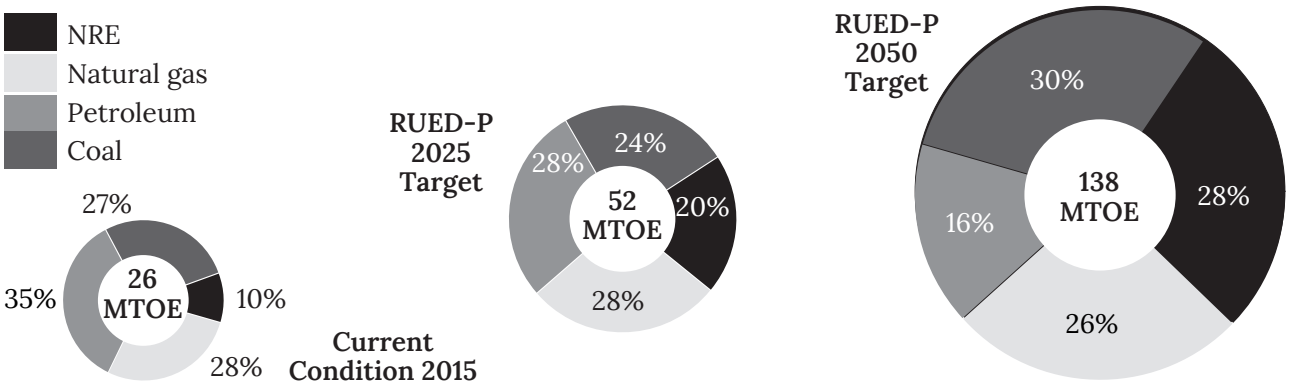


Figure 4. Percentage of Primary Energy Mix Target of West Java Province RUED, 2025–2050
Source: Dinas ESDM Jawa Barat (2023).

concern because it contributes to reducing fossil use and realizes clean and environmentally friendly energy (Najicha, 2021).

The Role of West Java Government in Accelerating the Achievement of NRE Target Based on RUED-P West Java 2018–2050

The national government's response to implementing NRE also encourages subnational governments to implement NRE program acceleration with Presidential Regulation No. 11 of 2023 Article 3. Based on data from the Indonesian Ministry of Energy and Mineral Resources, as shown in Figure 5, there is a lot of NRE potential spread across various regions in Indonesia, namely micro-hydro potential, solar radiation, and wind potential (Kementerian Energi dan Sumber Daya Mineral Republik Indonesia, 2020).

According to Ridwan Kamil, Governor of West Java, Indonesia has abundant NRE potential and resources, which can reach 500 GW. In the National Meeting of the Association of Regional Producers of Oil and Gas and Renewable Energy (ADPMET), Ridwan Kamil stated that the energy needs of 270 Indonesians could be met by producing 50GW of NRE (Pamungkas, 2021). According to the map of NRE distribution in West Java, there are three sectors: micro-hydro, solar, and biogas (Dinas ESDM Jawa Barat, 2017).

Based on data from ESDM West Java, as shown in Figure 6, West Java has a strategic potential to achieve NRE because it has favorable natural resources. This was also conveyed directly by Ridwan Kamil, Governor of West Java, as an ambition for West Java to play a role at the forefront in realizing NRE (Hidayat, 2021). First, West Java has an estimated hydropower potential of ±2,861 MW from hydro or water potential, PLTM/PLTMH ±647 MW. Second, West Java has an estimated potential of ±9,099 MW from solar energy. Third, for wind potential, West Java can reach ±7,036 MW. Fourth, bioenergy potential consisting of biomass/biofuel (±1,979.8 MW) and biogas (±574.3

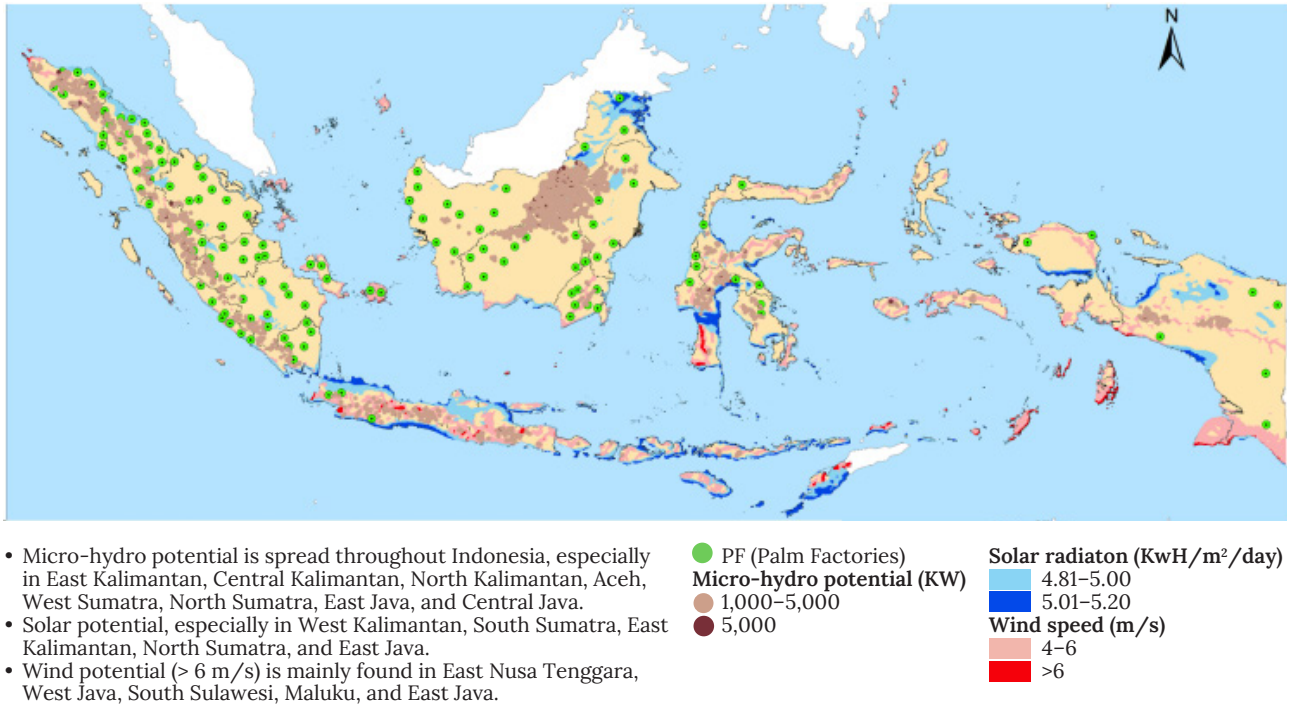


Figure 5. The Potential of NRE in Indonesia
Source: Kementerian Energi dan Sumber Daya Mineral Republik Indonesia (2020, p. 14).

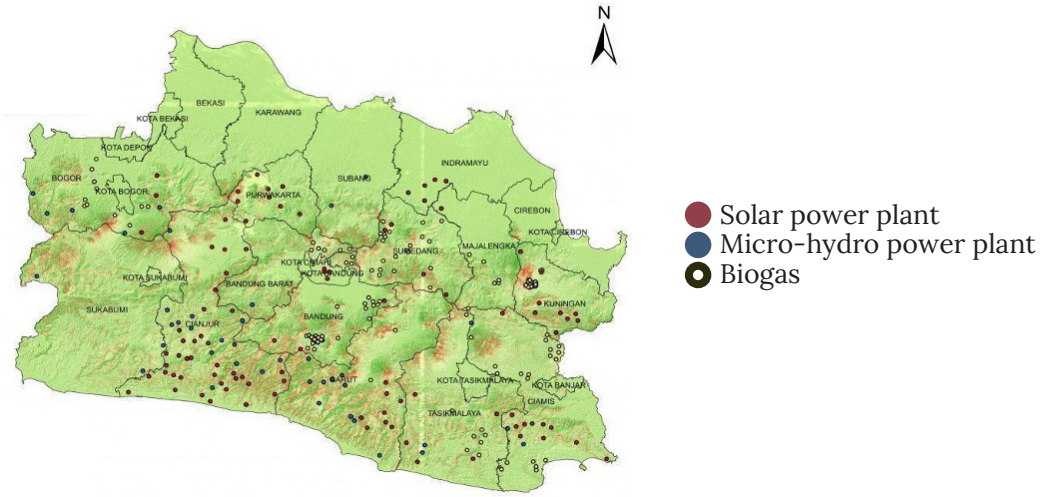


Figure 6. NRE Distribution Map in West Java
Source: Dinas ESDM Jawa Barat (n.d. -c).

MW) to reach a total estimate of ±2,554.1 MW. Finally, geothermal potential with its development directly under the national government and regulated in Law No. 23 of 2014 (Dinas ESDM Jawa Barat, n.d.-c).

Implementation of West Java's Role in Realizing NRE

According to the Ministry of Energy and Mineral Resources, subnational governments have several important roles in accelerating the achievement of the RUEN target in the NRE sector, including (1) optimizing the capacity and authority of subnational governments through the draft of new regulations facilitated based on the issuance of NSPK; (2) optimizing subnational regulations including system standardization, mechanisms, technical implementation, and NRE funding budgets in accordance with subnational potential; (3) becoming front liners in developing NRE; (4) the role of subnational governments in encouraging the community, community and grassroots in supporting the achievement of NRE targets and micro-scale technology development (Laia, 2022).

First, in optimizing the capacity and authority of subnational governments through a new draft regulation (based on the NSPK), the West Java government is one of 28 provinces in Indonesia with a RUED-P (Pamungkas, 2021). In its preparation, RUED-P needs to pay attention to supplementing juridical protection or environmental governance that can protect those affected (United Nations Environmental Programme, n.d.). The 2018–2050 RUED-P prepared by the West Java government is certainly based on the mandate of the National Government based on the suitability of national-level energy planning such as RUEN. RUED-P 2018–2050 also cooperates with existing general planning such as the Provincial Industrial Development Plan (RPIP), Subnational Long-Term Development Plan (RPJPD), and Subnational Medium-Term Development Plan (RPJMD), and takes into account other planning documents. This certainly impacts the achievement of the national NRE target and the national scale GHG emission reduction target. Therefore, the optimization of West Java's capacity or authority through RUED-P 2018–2050 has become a regulatory basis in the implementation of programs to achieve NRE, which is adjusted to the mandate of the national government, including RPJMN 2020–2024, Indonesia Vision 2045 and international conventions - Glasgow Climate Pact. RUED-P West Java 2018–2050 contains various

regulations and articles covering general provisions, scope, position, systematics, coordination (guidance, supervision, and evaluation), institutions, cooperation, funding, and other provisions that have not been discussed and will be discussed based on Presidential Regulation No. 22 of 2017 (PERDA, 2019).

Second, in maximizing subnational regulations, including system standardization, mechanisms, technical implementation, and NRE funding budgets in accordance with local potential, the West Java government has several role implementations. First, in maximizing the standardization of systems, mechanisms, and technical implementation of NRE, the West Java government has prepared West Java Governor Regulation Number 15 of 2019 concerning the Strategic Plan of the Local Apparatus of West Java Province for 2018–2023 and the Draft Amendment to the Strategic Plan of the Energy and Mineral Resources Agency of West Java Province for 2018–2023. Both strategic plans discuss regulations, including funding budgets, standardization, implementation, mechanisms, and technical achievement of NRE targets. In addition, in its implementation, West Java has also mapped the distribution of NRE potential in the West Java region, which can be maximized to maximize and facilitate the mechanism and technical implementation of NRE. Second, in maximizing the NRE funding budget for 2019, the core activity budget from the APBD-P for NRE implementation amounted to IDR10,602,500,112, while the budget for supporting activities amounted to IDR737,397,748. From this budget, West Java succeeded in meeting the targeted emission reduction achievement of 539.57 tons of eCO2 and accumulatively in 2019 of 1,013,017.32 tons of eCO2 or 3.81% of the 3.37% target when compared to BaU 2020 and 1.84% of the 1.63% target when compared to the BaU 2030 accumulative emission reduction achievement target (LKIP, 2020). In 2020, the impact of the pandemic prompted budget refocusing so that the achievement of emission reduction remains at 1.84% against the 2030 BaU. Then, in 2021, the core activity budget was 1,937,000,000 with the realization of a reduction of 28,880.15 tons of eCO2 and accumulatively in 2021 of 1,041,897.47 tons of eCO2 or 3.92% of the 2020 BaU achievement or 1.90% of the achievement target of 5.13% of the 2030 BaU (LKIP, 2021). For more details, see the recapitulation table of GHG emission reduction achievements of West Java Province in 2019–2021 in Table 2.

Third, in becoming a frontline to develop NRE in accordance with field needs, the West Java government has made several concrete efforts to realize the NRE target. First, West Java optimizes the potential of its NRE resources by proposing a list of NRE developments in West Java. Based on ESDM West Java, 29 NRE development proposals comprised 17 micro-hydro/PLTMH energy, eight waste energy (biogas), and four solar energies spread across five regencies in West Java (Dinas ESDM Jawa Barat, n.d.-b).

Table 2. Percentage of Recapitulation of Greenhouse Gas Emission Reduction Achievements of West Java Province, 2019–2021

Performance	Year		
	2019 (%)	2020 (%)	2021 (%)
Accumulative target against BaU 2020	3.37	5.06	0
Accumulative target against 2030 BaU	1.63	2.45	5.13
Accumulative realization against BaU 2020	3.81	3.81	3.92
Accumulative realization against 2030 BaU	1.84	1.84	1.90
Capaian kinerja	112.88	100	103.26

Source: Dinas ESDM Jawa Barat (2021, p. III-14).

Table 3. List of Proposed West Java NRE Development

District	Type of NRE sources	Location Units	Potency
Subang	Micro-hydro/PLTMH	13	679,46 KW
Bandung	PLTMH	3	432,621 KW
Tasikmalaya	Solar powr	4	600/80 Wp/KK
Sumedang	Cow manure waste (biogas)	5	509 heads 168 unit
Pangandaran	Biogas	3	n/a
	PLTMH	1	n/a

Source: Dinas ESDM Jawa Barat (n.d.-b).

The data on Table 3 shows the proposed development of NRE in several regencies including Subang Regency with MHP/micro-hydro energy type in 13 location units and estimated potential of 679.46 KW; Bandung Regency with MHP energy type in 3 location units with an estimated potential of 432.621 KW; Tasikmalaya Regency with solar power in 4 location units with estimated potential of 600/80 Wp/KK; Sumedang Regency with Cow Dung Waste (biogas) in 5 location units with an estimated potential of 509 heads of 168 units; and Pangandaran Regency with Biogas in 3 location units and PLTMH in 1 location unit with an estimated potential that is not yet known. From the list of proposals above, West Java has succeeded in building 84 units of core mitigation actions in the energy sector in 2021, consisting of 31 MHPs, 27 PLTS, 15 PLTMs, 1 Energy Efficiency PJU (Public Street Lighting) System, and 10 Biogas Digesters (Substitution of fossil fuels to biogas) (LKIP, 2021). These mitigation actions have reduced emissions by 28,880.152 tons of CO2 in 2021 (LKIP, 2021, p. III-13). West Java residents who have utilized the total number of NRE sources are 7.88%, with an average value of 978/year (Open Data Jabar, 2022). Then NRE that has been utilized by families based on Regency/City in West Java is 1,228/100% with an average value of 1,228/year, and the highest number of values is 124 from Cirebon Regency (Open Data Jabar, 2021a). First, the total number of families that have utilized biomass is 4,873/100%, with an average value of 4,873, and the highest value is from Tasikmalaya District, which is 3003 (Open Data Jabar, 2021b). Second, there are 125,466/100% of the total number of families by city/district in West Java that have utilized solar energy with an average value of 125,466/year, and Ciamis Regency has the highest value with 22,045 (Open Data Jabar, 2021c). Third, 335/100% of the total number of families based in cities/districts in West Java have utilized micro-hydro energy with an average value of 335/year, which Sukabumi Regency dominates with the highest value of 304 (Open Data Jabar, 2021d).

In addition to the three types of NRE sources in the list of proposed NRE energy development in West Java, the West Java government developed a geothermal power plant with an installed capacity of 1269 MW, 2525 Mwe (resources), and a total production bonus of 145,862,188,793 (Jabar, 2021b). The development of geothermal power plants in West Java certainly contributes to the utilization of Indonesia's geothermal potential of 24 GW (Humas EBTKE, 2022). Table 4 explains the implementation of the West Java geothermal power plant development, resulting in a total production bonus of 145,862,188,793 with an installed capacity of 1269 MW.

According to data on Table 4 from ESDM, West Java has utilized geothermal energy by 20% with a capacity of 5,956.80 MW. In contrast, wind and solar energy still have not reached 1%. According to ESDM West Java, the largest NRE potential is solar power, which reaches 156,630 gigawatt peak (GWp) and wind of 12,272 megawatts (MW) (Sinaga et al., 2022). This means that the data shows that massive optimization

Table 4. Geothermal Power Plants in West Java

District	Developer	Total Production Bonus	Status
Subang	PT. Wahana Sambadhasakti	-	Exploration
Bandung	Star Energy Geothermal Darajat Ltd.	1,895,180,133	Production
	Star Energy Geothermal Wayang Windu Ltd.	30,660,338,750	Production
	PT. Pertamina Geothermal Energy	14,111,022,103	Production
	PT. Geodipa Energy	7,433,581,858	Production
	PT. Kopjasa Keahlian Teknosa	-	Exploration
	PT. Tangkuban Parahu Geothermal Power	-	Exploration
Sukabumi	Star Energy Geothermal Salak Ltd.	27,815,878,728	Production
	PT. Jabar Rekind Geothermal	-	Exploration
Sumedang	PT. Wijaya Karya Jabar Power	-	Exploration
Bogor	Star Energy Geothermal Salak Ltd	31,073,582,124	Production
Garut	Star Energy Geothermal Darajat Ltd.	31,107,404,684	Production
	PT. Pertamina Geothermal Energy	1,765,200,413	Production
	PT. Pertamina Geothermal Energy Karaha Bodas	n/a	Production
Majalengka	In the IUP issuance process	-	Exploration

Source: Dinas ESDM Jawa Barat (n.d.-a).

of NRE potential in West Java needs to be done. In addition, the implementation to increase NRE is also carried out by West Java through PLTMH, PLTS SHS (solar home system solar power plant), and rooftop PLTS. The rooftop PLTS program started from several government offices such as the West Java ESDM Office (14.8 kWp), Pakuan Building (22.8 kWp), DPRD Building (85 kWp), and subnational ESDM office (Sinaga et al., 2022). The role of the West Java Government has also successfully encouraged the Danone Aqua company to use industrial rooftop solar PV, which has a system capacity of 2,112 kWp, and 2.3 GWh of electricity output per year. This NRE transition can also reduce CO2 by 1,916 tons annually (Yuginsah, 2021).

Fourth, the role of the West Java government is to encourage the community and grassroots to support the achievement of NRE targets and the development of micro-scale technology. The success in realizing the NRE transition is public or community participation (Wijoyo, 2017). Tomkins (1999) also emphasizes that public/community participation is a keyword for success in achieving accountability and responsibility for a policy. Therefore, to perform the fourth role, the West Java government has taken several concrete steps to encourage people and communities to achieve the ambition of the NRE target. First, through the Jabar Smile program. The program aims to invite people to switch to using NRE. The West Java Government, assisted by PLN Unik Induk Distribusi Jawa Barat, introduced several electric energy-based products to the public to support the energy transition program. One of the products introduced is electric energy-based vehicles (Ariyanti, 2022). In 2022, 545 units of electric energy-based vehicles were recorded and used by people in West Java (Sarasa, 2022). The 545 electric energy-based vehicles are dominated by motorcycles. The West Java Government also explained that the Public Electric Vehicle Charging Station (SPKLU) infrastructure was constructed and developed. In 2022, West Java had 104 SPKLUs and plans to increase the number in 208 more locations (Pun, 2022). In 2024, additional SPKLUs in West Java will be added with a public business scheme (rental) in 416 locations (Pun, 2022). The West Java government assures the public not to worry about electric-based products and vehicles because West Java is committed to supporting the communi-

ty's transition to NRE and guaranteeing 40% of electricity energy reserves. Second, in addition to encouraging the community with the Jabar Smile program, the West Java government is also actively encouraging the community to support the NRE transition through the development of rooftop PLTS by reaching several Islamic boarding schools in West Java. The rooftop solar PV program with Islamic boarding schools in West Java has a cooperation scheme with the British Embassy. In addition to Islamic boarding schools, the West Java government also reaches 173 SMA/SMK and schools in West Java with an alternative financing scheme for rooftop implementation so that the NRE transition can be realized more massively (Sinaga et al., 2022). Third, the West Java Government also collaborates with several international institutions, such as the University of Nottingham, as a partner in transferring applicable technology in the transportation sector to reduce carbon emissions through NRE. In this case, cooperation is needed, which includes member regulation and cooperation between cooperatives/institutions in emphasizing and affirming the NRE mission (Esmaeili & Najafii, 2019). The function of this cooperation is also emphasized as a medium for connecting applicative technology inventors, such as academics and the industrial world, with West Java to jointly realize a sustainable energy transition (Dinas ESDM Jawa Barat, 2022).

Test Analysis of Opportunities and Constraints of West Java Government in Achieving 20–28 Percent NRE Target

This analysis test is carried out to explain the opportunities and constraints of the West Java government in achieving the 20%–28% NRE target in 2025 and 2050 which is based on an analysis according to Albert Humphrey consisting of Strength (advantages) owned by West Java to achieve the NRE target, Weakness (weaknesses) owned by West Java to achieve the NRE target, Opportunity (opportunities from outside) for West Java in achieving the NRE target and Threat (challenges from outside) West Java in achieving the NRE target. As explained in the previous sub-chapter, on a national scale, Indonesia still needs 13.85% to achieve the NRE target in 2025 and 21.85% to achieve the NRE target in 2050. On the scale of West Java Province, the West Java Provincial Government must increase the rate by 10% to achieve the target of 20% in 2025 and 18% in 2050.

The advantage of West Java is that it has RUED-P as a regulation, mechanism, technical implementation, and funding budget, including the Strategic Plan for Development Devices (RSPP) and the ESDM Strategic Plan (Rensra). In addition, West Java also has much potential in realizing national NRE targets such as the potential of 3,508 MW (water/micro hydro), 3,999 MW (solar energy), 7,036 MW (wind), 2,554.1 MW (biogas) and 5,956.80 MW (earth temperature). This advantage has also been utilized by successfully developing 84 NRE mitigation action units, building 104 SPKLUs, and producing 145,862,188,793 geothermal energy production with an installed capacity of 1269 MW (LKIP, 2021). The weaknesses or shortcomings that West Java has are budget refocusing due to the impact of the pandemic and causing constraints on the construction of 7 NRE agency service branches (LKPI, 2021). This constrained infrastructure development impacts energy availability in the region (Setyono & Kiyono, 2021).

Opportunities (from outside) owned by West Java include maximizing authority based on Perpes No. 11 of 2023, collaborating with outside government institutions or agencies in encouraging NRE investment as has been done with the University of Nottingham as an applicable technology transfer partner in the NRE-based transpor-

tation sector, the British Embassy, etc. As for the challenges (from outside) for West Java, on a national scale, there are five common obstacles (Ahsan, 2021). First, future pandemics that can hinder the implementation of NRE actions. Second, 83% are dissatisfied with NRE regulations (national scale), so national government policies have not fully supported the economic feasibility of NRE investment (RUU EBT is still being drafted). Certainty (stable policy) and efficiency (efficiency, ease, and transparency of investment) are the main points that Indonesia must consider to get investors (Perry, 2000). Third, there is a 73% lack of coordination between ministries and government agencies in Indonesia, which can hinder the process of realizing NRE cooperation in West Java. This is reinforced by studies from Sadiawati et al. (2019) and Muhlizi (2017), which argue that the lack of coordination between ministries can hinder the achievement of optimal policies, including the target of achieving NRE. Fourth, 63% of bureaucracy and licensing are difficult for potential NRE investors in Indonesia so that they can hinder the funding process and budget distribution to subnational governments. In addition to the lack of coordination and stable policies that can hinder foreign investment and renewable energy exploitation (Erdiwansyah, 2019), Indonesia must also provide a statement or commitment (explicit/implicit) in the NRE investment agreement (legitimate expectation of investors) as a form of attention to this obstacle (Klager, 2011). Fifth, 50% of NRE tariffs are expensive (Kementerian Energi dan Sumber Daya Mineral Republik Indonesia, 2020). The implementation of NRE in Indonesia also still requires research development and technological innovation (Firdaus, 2022). The weakness of NRE research in Indonesia, according to Soffian Effendi (in Muna, 2011), is the lack of funding and the uneven quality of human resources in the field of NRE. For this reason, the role of the government in encouraging knowledge and innovation policies, including the development of NRE research and science and technology, is needed (Pradana et al., 2021). Table 5 explains the SWOT analysis of the West Java government in achieving the NRE target.

Based on the results of the analysis test shown in Table 5, it can be seen that West Java's advantages in achieving the NRE target are more than its weaknesses. As for opportunities (from outside), West Java is less than obstacles or challenges (from outside) in realizing the NRE target. Therefore, four things need to be considered by the Indonesian House of Representatives in carrying out the oversight function to

Table 5. SWOT Analysis of West Java Government in Achieving NRE Target

Strength	**Weakness**
- RUED-P, RSPP ESDM, ESDM Strategic Plan in achieving NRE - Renewable energy potential: 3,508 MW (hydro/micro hydro), 3,999 MW (solar energy), 7,036 MW (wind), 2,554.1 MW (biogas) and 5,956.80 MW (geothermal). - 84 mitigation action units & 104 SPKLUs	- Budget refocusing due to pandemic impact - Not implemented seven installations of NRE service branches
Opportunity	**Threat**
- Optimizing the authority of Presidential Regulation No. 11 of 2023 - Optimization of cooperation with other institutions or agencies in the implementation of NRE	- Pandemics in the future - National government policy has not yet supported the economic feasibility of NRE investment (still in the design process) - 73% lack of coordination between ministries in Indonesia - 63% bureaucracy and licensing difficulties for NRE investors - 50% expensive renewable tariff

encourage the role of the West Java government in achieving the NRE target. First is integrating NRE regulations/policies of the national and subnational governments, including integrating regulations/policies to ministries/institutions and government agencies in Indonesia. This concept of policy integration leads to the formation of policies in which each of its components - policies and organizations - work under a new logic by placing their goals under a new overall goal, as well as making their decisions in accordance with the needs and priorities in achieving the same goal (Cejudo & Michel, 2017). Second, simplifying the bureaucracy protected by law in achieving Indonesia's NDC targets. This bureaucratic simplification is not only to invite NRE investors but also to show that the NRE agenda is an agenda that must be adopted by various sectors (Maskun et al., 2022). Third, the distribution of budget and financing for NRE should be optimized, which aims to achieve NDC reduction, including energy and technology transfer, at the subnational scale. Determination of internal and external sectors in NRE implementation is needed (Stadelmann & Castro, 2014). Fourth, screening and monitoring of NRE implementation based on RUED and periodic evaluation of target improvement.

Conclusion

The West Java Government has made several efforts to achieve the new and renewable energy (NRE) target, including the implementation of adaptation and mitigation in reducing GHG emissions in accordance with REUN, Indonesia's NDC, and the Glasgow Climate Pact. The West Java RUED-P has regulated several important points in implementing adaptation and mitigation of NRE transition in West Java, including optimization of energy potential implementation of budget funds for adaptation to climate change. The role of the West Java government in supporting NRE targets based on the Glasgow Climate Pact is divided into four things, namely optimizing the capacity and authority of subnational governments through the draft of new regulations (based on NSPK); optimizing subnational regulations including standardization, implementation, mechanisms, technical achievement of NRE targets and budgets (according to subnational NRE potential); NRE development according to local and field needs by becoming a frontline; and encouragement for the community, community and grassroots towards achieving NRE targets and developing micro-scale technology.

Based on the SWOT analysis of the West Java government in achieving the NRE target, the following are several recommendations for the Indonesian House of Representatives to perform its oversight function in encouraging the role of the West Java government as a subnational actor to be optimal in achieving subnational scale NRE targets and helping to achieve national scale NRE. First, the Indonesian House of Representatives' oversight function is to integrate national and subnational government NRE regulations, integrating regulations with ministries/institutions and government agencies in Indonesia.

Second, the Indonesian House of Representatives' oversight function towards simplifying the bureaucracy protected by law in achieving Indonesia's NDC target. This simplification is carried out because it is often the main obstacle in implementing the West Java government in accelerating NRE and RUED-P, including simplifying the bureaucracy and licensing of NRE investors. Third, the Indonesian House of Representatives' oversight function is geared towards optimizing the distribution of NRE budgets and financing and the goal of reducing NDC, including energy and technology transfers, at the subnational scale. This optimization also aims to ensure that the NRE budget funds can still be implemented despite the pandemic in the future so that

Indonesia's responsibility in achieving the 41% NDC can still be carried out. The assistance of subnational actors (subnational governments) is needed to achieve national targets, namely by providing and encouraging the capacity of subnational governments to maximize budgets in the NRE sector, adaptation and mitigation of climate change, including recapitulation reports on NRE achievements from each subnational government.

The attainment of NRE targets and Indonesia's NDC cannot solely rely on one sector. Hence, the engagement of subnational actors, such as subnational governments, becomes imperative to actualize these objectives. Harmonized regulations and shared visions between the national and subnational administrations, encompassing the West Java Provincial Government, are pivotal in expediting Indonesia's fulfillment of international agreements. This encompasses Indonesia's commitments to the Paris Agreement and the Glasgow Climate Pact.

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