

Indonesia's New Renewable Energy Transition Towards G20 Presidency

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Introduction

The G20 Energy Transition was launched as part of Indonesia's G20 Presidency starting December 1st, 2021 until the G20 Summit in November 2022. This presidency is very important for Indonesia as a global citizen who has an important role in supporting clean energy and the world's climate. The G20 Energy Transition is expected to produce more concrete results of the G20 trial to strengthen a sustainable global energy system, as well as a just energy transition in the context of sustainable recovery. The energy transition pillar will raise three priority issues, namely access, technology, and funding. With the urgency of these three issues, it is hoped that a global agreement can be reached in accelerating the energy transition.

Indonesia's commitment to seek a global agreement in accelerating the acceleration of the energy transition has the full support of several international organizations. As a country that has influence in the Southeast Asia region on global energy issues, Indonesia has a strong influence in the Southeast Asia Region on global energy issues. Energy transition was identified as a priority issue in Indonesia's G20 Presidency. Through this forum, Indonesia has the opportunity not only to boost political momentum but also to demonstrate leadership in the energy transition through action. The International Renewable Energy Agency (IRENA) welcomes Indonesia's commitment to achieve Net Zero Emissions (NZE) by 2060 or sooner.

NZE is seen as a climate change mitigation effort that will be able to increase per capita income up to 2.5 times and provide GDP per year up to 2% higher than Business as Usual (BAU). This will provide a good opportunity for Indonesia to move towards sustainable national development by prioritizing a just and affordable transition. The Indonesian government itself has committed to addressing climate change through the Nationally Determined Contributions (NDC) document which targets emission reductions by 2030 by 29% with their own efforts and 41% with international support. This commitment has also been renewed through the submission of the Updated NDC in 2021, which includes a long-term strategy for low carbon and climate resilience 2050 (Long-Term Strategy for Low Carbon and Climate Resilience 2050) which targets achieving NZE by 2060.

South Korea signed the Paris Agreement which has become a global consensus. Thus, South Korea will develop and enlarge the portion of new and renewable energy (NRE) power plants in parallel with reducing fossil energy use and reducing greenhouse gas (GHG) emissions towards

NZE. The application of the green economy in Indonesia itself has made significant progress. This can be seen from the start of commercial operations or the Commercial Operation Date (COD) of various NRE power plants ranging from geothermal, wind, and so on. The government is trying to increase the portion of the use of new and renewable energy, especially in the electricity sector. In its implementation, the government will prioritize the development of solar energy because the investment costs are cheap and do not take much time.

Indonesia's NRE Potential

Indonesia has a large renewable energy potential, reaching 417.8 gigawatts (GW). The Ministry of Energy and Mineral Resources noted that this potential comes from ocean currents of 17.9 GW, geothermal 23.9 GW, bioenergy 32.6 GW, wind 60.6 GW, water 75 GW, and solar 207,8 GW. It is believed that renewable energy will not run out for the next 100 years. In addition, technological developments will make renewable energy more competitive. However, up to now, the utilization of renewable energy in Indonesia is much smaller than the existing potential, which is only around 10 GW in 2020. The provinces of West Kalimantan, East Kalimantan, Central Kalimantan, West Java, Central Java, East Java, West Nusa Tenggara, North Sumatra, South Sumatra, and Papua are the ten provinces with the largest renewable energy potential in Indonesia.

Currently, the development of NRE refers to Presidential Decree No. 5 of 2006 concerning National Energy Policy. The Presidential Decree states that the contribution of NRE in the national primary energy mix in 2025 is 17% with a composition of 5% biofuels, 5% geothermal, biomass, nuclear, water, solar and wind 5%, and liquefied coal of 2 %. For this reason, the steps that will be taken by the Government are to increase the installed capacity of micro hydro power plants to 2,846 MW in 2025, 180 MW biomass installed capacity in 2020, wind installed capacity (PLT Bayu) of 0.97 GW in 2025, solar 0.87 GW in 2024, and 4.2 GW nuclear in 2024. The total investment absorbed by NRE development until 2025 is projected at 13,197 million USD.

The development of solar energy includes the use of PV mini-grid in rural and urban areas, encouraging the commercialization of PV mini-grid by maximizing private sector involvement, developing the domestic PV mini-grid industry, and encouraging the creation of an efficient funding system and pattern by involving the banking sector. Efforts to develop wind energy include developing wind energy for electricity and non-electricity (pumping water for irrigation and clean water), developing simple wind energy technologies for small (10 kW) and medium scale (50 - 100 kW) and encouraging manufacturers to produce mass small and medium scale.

Indonesia's Supply and Demand of Energy Outlook

According to McKinsey, the long-term fundamental growth of Indonesia's energy market will remain strong, driven by projected healthy long-term GDP growth, a young population, and a desire to reduce imports and the current account deficit. According to McKinsey's forecast, the short-term decline in energy demand caused by the pandemic is expected to recover by 2022. Of

course, there needs to be a transformative change immediately to pave the way for a better future. As a global leader at the end of the 20th century, Indonesia's energy sector is certainly currently facing various challenges in maintaining its status. In its 2020 assessment, the World Economic Forum ranked Indonesia 91st among 115 countries in energy transition readiness and 58th in energy system performance, which it called “potentially challenged.”

With demand growth slowing in recent years, Indonesia can prioritize the reliability, efficiency and sustainability of the electricity sector. Supply security can be increased, for example, through investments in flexible capacities such as batteries, network upgrades, to automation for real-time load management. Digital technology and smart grid systems can also increase network efficiency by providing predictive maintenance, drone-based infrastructure inspections, and optimized power plant operations. The rate of energy transition needs to consider cost trends. Large capital expenditures for transmission infrastructure, especially in remote areas where renewable energy is usually abundant. Areas of Indonesia that currently get electricity from diesel generators, such as the Eastern Archipelago, are very suitable for renewable energy. Cost trends are making renewables even more attractive, which can lead to cost reductions of more than 50% for batteries and two-thirds for solar panels.

The accelerated development of renewable energy has become a hallmark of the energy strategies of many countries. In 2019, New Zealand and the UK pledged to be carbon neutral by 2050. Indonesia could also take aggressive steps to develop energy security and sustainability using renewable technologies. Currently, coal-fired power plants generate about 60% of the country's energy, and natural gas plants contribute an additional 22%. As a result, Indonesia barely exploits its potential for renewable energy. If fully developed, renewable energy in Indonesia could have a total capacity of more than 400 gigawatts. This is more than sufficient to meet Indonesia's future demands.

Korea's Investment and Technology Prospects

South Korea is a strategic investment source for Indonesia, as evidenced by statistics demonstrating that Indonesia is a major Korean investment destination abroad, with a total investment value of USD 8.5 billion. According to statistics, Indonesia is ranked second after Vietnam among the eight ASEAN countries (19.10 %) and third among the 91 Korean investment targets worldwide (7.47 %). Korea ranks 4th out of 144 countries that contribute to foreign direct investment (FDI) in Indonesia, excluding the upstream oil and gas and banking industries, based on the realized value of investment from 2012 to semester I of 2018. According to data from the Indonesian Coordinating Board of Investment, 2,160 projects from the South Korea were approved in the third quarter of 2018.

Korea and Indonesia can be partners in cooperation to jointly respond to sustainable development and deal with climate change. First, strengthening the Korea-Indonesia partnership in the clean energy sector. In Indonesia, Korea will expand new renewable energy projects, such as hydro, solar, and others. If we distribute environmentally friendly energy through an ESS

(energy storage system) that is connected to new and renewable energy and is in accordance with Indonesia's geographical conditions, the transition to a green economy in Indonesia will be faster. Second, Korea and Indonesia can seek cooperation opportunities in the green finance sector, which can encourage environmentally friendly company activities, such as in the field of research and development of green technology, including carbon dioxide collection and storage and trading of carbon emission rights. Judging from the impressive development of cooperative relations over the past half century, Korea and Indonesia have upgraded their relations to become Special Strategic Partners in 2019.

Furthermore, PT Pertamina Gas Negara (PGN) Tbk as sub holding Gas Pertamina establishes a synergy with an energy company from South Korea, namely SK E&S Co., Ltd (SK) in the context of developing clean energy, especially in the Liquefied Natural Gas (LNG), hydrogen, and carbon capture business and storage (CCS), so that it can increase the growth of the natural gas business as well as efforts to reduce carbon emissions. SK is a company that focuses on electricity, LNG, renewable energy, communal energy, city gas, various overseas energy businesses and business development in hydrogen and CCS. PGN and SK will conduct a joint study regarding the potential for cooperation in the development of hydrogen and CCS in Indonesia. In addition, PGN and SK will jointly look for opportunities to develop the gas business in Indonesia and Korea, including conducting LNG trading. SK has experience capabilities in the field of hydrogen and CCS development. It is hoped that PGN will learn a lot later, so that it can apply the right technology to reduce carbon emissions in natural gas utilization.

Then, in the renewable energy sector, the approved project was the development of the Teunom 2 and 3 Hydroelectric Power Plants worth US\$ 800 million by Hyundai Engineering and Terregra Asia Energy. There is also the development of the 50 MW Pongkeru hydropower plant worth US\$ 300 million by Korea Midland Power, Hyundai Engineering, POSCO E&C and Sulindo Putra Timur, the development of the Peusangan hydropower plant by Hyundai, Korea Southeast Power, and Wijaya Karya worth US\$ 430 million. As well as the development of the 77 MW Samarkilang hydropower plant worth US\$ 300 million by Korea Midland Power, Lotte E&C, and Bener Meriah Electric Power.

Conclusion

Sustainable energy transition is one of the priority issues in Indonesia's G20 Presidency in 2022. Through this G20 Forum, Indonesia can encourage the world's collective efforts to realize policies to accelerate global economic recovery in an inclusive manner. Indonesia also has the opportunity to show the world its full support for the global energy transition. The Indonesian government has also committed to accelerating the energy transition. In addition to setting the energy mix target of NRE of 23% by 2025, President Joko Widodo also emphasized Indonesia's commitment to fulfilling NZE by 2060 or sooner. Indonesia and Korea have active cooperation in the hydropower and NRE sectors. This activity is believed to be beneficial for both parties, including discussions on traditional energy to carbon emissions.

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