

Renewable Energy – Prospect and Progress

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Currently, power plants in Indonesia are still dominated by fossil energy, particularly Coal-fired Power Plants (Pembangkit Listrik Tenaga Uap/PLTU) as Indonesia has significant coal reserves, the primary energy of PLTU. This, coupled with the advancement of PLTU technology, PLTU becomes more efficient, flexible and more reliable to supply electricity to PT Perusahaan Listrik Negara (PLN) as the state-owned electricity power and distribution company.

However, in line with the increasing concern of the negative environmental issues related to PLTU, the development of New and Renewable Energy (NRE)-based power plants is inevitable. Electricity production from NRE power plants, currently still quite minimal, will be stepped up in the coming years due to the Government's commitment to raise NRE portion in *Rencana Umum Penyediaan Tenaga Listrik* (RUPTL) 2021 – 2030 to around 50% from only 30% in RUPTL 2019 - 2028.

In 2019, around 43% of the total installed capacity of power plants in Indonesia was PLTU¹, in line with our previous explanation that coal has been the main pillar of electricity production. For NRE itself, Hydro Power Plant (Pembangkit Listrik Tenaga Air/PLTA) still dominates with 7.98% of the total installed capacity, of which PLTA Cirata of 1,008 MW was the largest, followed by Geothermal Power Plants (Pembangkit Listrik Tenaga Panas Bumi/PLTP), contributing 3.06% to the total installed capacity.

However, viewed from the production side, it turns out that PLTU accounts for around 61% of electricity production in Indonesia, whereas PLTA only around 5% and PLTP even smaller, around 2% of domestic electricity production. It is safe to say that Indonesia is currently highly dependent on electricity production from PLTU, as NRE power plants are less reliable compared to PLTU due to the unstable supply of primary energy leading to an unstable Actual Equivalent Availability Factor and a higher production cost. These conditions lead to a higher Capacity Factor of PLTU than that of NRE-based power plants.

Geographically, almost all regions of Indonesia have a high potential to build NRE power plants. Papua has the potential for Wind Power Plant (Pembangkit Listrik Tenaga Bayu/PLTB) up to 22 GW, followed by Kalimantan of 21 GW, and Sulawesi of 10 GW². Currently, the biggest PLTB are located in Sulawesi, PLTB Sidrap with a capacity of 75 MW and PLTB Jeneponto of 72 MW. Other massive NRE power plants are PLTA Saguling of 797 MW, PLTP Gunung Salak of 377 MW, and PLTP Sarula of 330 MW.

Compared with other countries, NRE only contributed around 14% of Indonesia's electricity production³. Meanwhile, Brazil was the highest with 86% of its electricity was generated from NRE power plants, particularly from PLTA, contributing 66% to the country's total capacity. In Asia, Japan and Vietnam was the highest with 49% and 44%, respectively. Solar Power Plants (Pembangkit Listrik Tenaga Surya/PLTS) was the biggest electricity producer for the two countries, with a total capacity of 67 GW and 17 GW, respectively.

We view there are several barriers for potential investors to invest in NRE business in Indonesia, including relatively high capital requirements with a relatively long construction period, scale of the projects offered to investors are less attractive, and limited access to local financial institutions⁴. These conditions lead investors to re-calculating whether or not to invest in Indonesia despite the potential of an NRE power plant to generate a higher profit margin with an EBITDA of up to 70% compared to a fossil-based power plant, such as a PLTU of around 50%.

¹ Data from Ministry of Energy and Mineral Resources (Kementerian ESDM), 2019

² Data from Ministry of Energy and Mineral Resources (Kementerian ESDM), 2020

³ Data from Ministry of Energy and Mineral Resources (Kementerian ESDM), 2020

⁴ Climate Policy Initiative (CPI), 2020

PEFINDO views that the Government may also learn from other countries on how to increase NRE power plants, such as the feed-in-tariff scheme in Thailand, where prices have been set by the Government. Currently, the Government is still working on this scheme to be applied in Indonesia. We also need to learn from Vietnam, which successfully boost its NRE capacity to 35.6 GW in 2020 from 23.7 GW in 2019. Vietnam widely opens access to financing sources, both domestic and off-shore financial institutions⁵. The country also exempted import tariffs for several goods related to NRE power plants, as well as income tax for the first four years. We view these incentives should be applied by the Government to attract potential investors. Despite the current electricity surplus of PLN combined with lower-than-expected demand in the near term due to the projected tepid economic growth of only around 4% in the near term impacted by the pandemic, we view potential markets for NRE power plants exist, particularly PLTS and micro-hydro power plants (PLTMH) in several remote areas to expand the electrification ratio, such as East Nusa Tenggara, Maluku, Central Kalimantan, and Papua.

In addition to NRE power plants' capacity improvement, the Government is also in the process to reduce the PLTU generated portion to be implemented in line with the expiration of Power Purchase Agreement (PPA) between PLN and investors. Currently, PLN encourages private sectors to invest in NRE power plants, with the long-term goal to replace all PLTUs by the year 2056.

Developing NRE power plants, both PLTA and PLTP, entail particular inherent risks given its relatively more complex construction and operational risks. In PLTA, investors have to explore the rainfall and water levels of the project several decades back to find out the potential electricity to be produced by power plants. Another risk is an unstable electricity production by the power plant, which is highly dependent on seasonal conditions. In PLTP, the risk begins at the time of exploration, which requires a substantial capital expenditure and takes up to two years. The risk remains during the construction phase as it may take around three to four years since they are mostly located in the mountains or highlands. The long exploration and construction periods, which require a substantial capital expenditure, may limit its financial flexibility to obtain external financing. This condition may be partly mitigated by a PPA between PLN and investors that generally lasts around 25-30 years with a pre-determined purchase price and the increasing commitment of financial institutions to finance green energy projects.

To support the development for renewable energy, several financial institutions have stated their commitments to reduce their exposure to finance fossil-based power plants. Other creditors have also begun to factor in Environmental, Social, and Governance (ESG) aspects in providing loan facilities. Higher ESG points lead to lower interest rates and will further increase the yield of investors. Quite similar conditions occurred in Indonesia where ESG-based investments have increased considerably. For PEFINDO, ease of access to financial institutions is one of the positive assessments to assign credit rating, and therefore we may take into account the appetite from creditors and investors toward ESG and renewable energy when conducting rating assessment to ESG-compliant electricity companies.

⁵ Institute for Essential Services Reform, 2020

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