RE-01

POLICY BRIEF (JULY, 2020)

SOLAR ENERGY: TOWARDS ENERGY INDEPENDENCY

1. Introduction

Indonesia is a tropical country with optimal potential to use Solar Energy coupled with growing potential of the battery industry. Yet, Indonesia has so many small and isolated islands which desperately need of electricity. This problem is triggered by monopolistic regulation on electricity market. The current coal-biased Perusahaan Listrik Negara (PLN)-centric policy planning process would not be efficient to reach Indonesian goals to 100% electrification, as the distribution of electricity to the area require high cost and downturn innovation as consequences of the absence of competition.

Several solutions offered is by moving toward diversification of the generating mix, opening up energy market to Independent Power Producers (IPPs), identify and resolve the management intermittency question of in-grid Solar Energy with encouragement of research and development through competitive market, and focus on developing locally produced energy would support Indonesia toward 100% electrification and reducing greenhouse gas. Additional from reaching 100% electrification goal, investment in Solar Energy would create jobs and opportunity (solar and lithium asset) and climate targets at lower cost.

2. Issues

Indonesia is a tropical country and located in the equator line, so it has an abundant potential of solar energy— one of the most promising sources of renewable energy and considered as the most economical alternative. Most of Indonesian area get enough intensity of solar radiation with the average daily radiation around 4 kWh/m2. The growing potential of the battery industry and nickel mining would help to tackle Solar Energy basic flaw, its intermittency (dependency to the Sun rotation).

Indonesia is an archipelagic state with many small and isolated islands which desperately need of electricity. However, Indonesia faces multiple large challenges in its electricity system. Economic growth and increasing energy access are projected to

increase power demand by more than 8% annually until 2020, and significant capacity additions will be needed for production to keep up with the demands. Indonesia also needs new capacity to reduce its dependence on oil based (diesel) power generation, because of rising fuel and subsidy costs.

Indonesia has already opened its market for Independent Power Producers (IPPs). However, all companies will need to use PLN's existing transmission network. As the single buyer as well as the single seller of electricity in Indonesia, PLN typically has the authority to decide which projects is going to be approved and prioritized. Having single control of the transmission and distribution systems also means PLN gets to choose where and when the grid should be built next. Yet, PLN could not tackle the heavy nation- wide distribution cost.

The current PLN-centric policy would discourage new players to enter into market. In several cases, local PLN officials have resisted permitting new solar units on the basis that they would not be able to compete with lower day-time cost producers. It is also found that PLN officials appeal to IPPs to bear the cost of spinning reserve in case of power mismanagement due to the grid's inability to manage intermittency nature of Solar Energy. This results in financial losses for the operator due to the take and pay terms of power purchase agreements. Technical challenge to ensure total electrification while meeting country's climate change goals, could be solved by opening up possibilities to innovation. However, the absence of competition discourages research and innovation.

Diversification of the generating mix would reduce dependence on a single resource or provider. This would insulate Indonesia from energy disruptions and strengthens energy security. By doubling of the share of renewable energy, Java-Bali and Sumatera could reliably meet growing electricity demand in the next 10 years. The cost of doubling the share of renewables through investment in wind and solar is comparable to the current high fossil-fuel pathway. This would result to the decrease of greenhouse gas emissions reduced by 36%, in line with Indonesia's vision.

Opening up energy market to Independent Power Producers (IPPs) and creating an enabling environment for IPPs with wider financing options. The Indonesian energy market is open for IPPs to compete, however there are several setbacks that if maintained would discourage investment. Since 2017, Ministry of Energy and Mineral Resources regulations (Permen ESDM) have stipulated that all IPPs are expected to transfer projects back to PLN after the power purchase agreement (PPA) expires. The Build Own Operate Transfer (BOOT) scheme as PPA's successor is regarded as a major barrier to bankability because of the high risk associated with land acquisition, rules out opportunities to lease land, and severely damage exit opportunities for investors.

Ministry of Energy and Mineral Resources also imposed local content requirements that were meant to encourage development of the domestic solar panel manufacturing industry. The assumption of that favourable treatment for local industry without transfer of knowledge package, enforcement of Intellectual Property Rights,

and sufficient competition hinder scientific development and innovation needed to maximizing the Solar Energy efficiency, not only for solar panel manufacture but also for a more affordable battery storage. High distribution cost due to Indonesia geographical condition requires Indonesia to focus on developing locally produced energy. Locally generated energy could prevent Java's 2019 power outage to repeat itself, support Indonesia toward 100% electrification, and reducing greenhouse gas from production and distribution.

Encouraging investment in Renewable Energy, particularly in solar energy sector would be impactful for research and development of nickel mining, the battery industry and other sector associated with solar energy. The market of solar energy is existing, both in consumers product and in industrial scale. Natural resources needed is accessible, the cost of industrial-scale solar technology continues to fall and the flexible grid strategies needed to deliver affordable solar are now market-tested. It would surely provide jobs and opportunity in many sectors. There is currently an emerging demand of Solar Energy. This enthusiasm should be responded with a proper consumer analysis of Solar Energy users. The purchasing power should be taken with utmost account. Economic incentives should also be given to individuals opted for solar energy for it to be a more desirable option. This is however, does not reflect the current implementation of ESDM Ministerial Regulation No. 49/2018. To be effective, the implementation of economic instrument should be combined with functioning command and control.

3. What Should Policy Makers Do?

To answer problems mentioned above, there are a few suggestions for policy makers. *First*, identify and resolve the management intermittency question of in-grid Solar Energy with encouragement of research and development through competitive market. *Second,* encourage greater Investment in Solar Energy and Battery Industry, especially in locally generated based Solar Energy. *Third,* create an enabling environment for IPPs, large and small scale. with wider financing options and ensure competitiveness of the market. *Four,* provide better package and incentive for Solar Roof users to increase demand. *Five,* provide complete package of local solar panel manufactures empowerment with transfer of knowledge and enforcement of IPR.

4. Why is This Important for Indonesia?

As part of the Paris Agreement, Indonesia committed to reduce greenhouse gas emissions by 29 per cent below its baseline emissions by 2030 (and by 41 per cent conditional on international support). Moreover, Indonesia is politically committed to supply all Indonesians with electricity. Indonesia could meet its energy and climate targets at lower cost by imposing a fundamental change in its economic incentives, subsidy, investment and energy policies. The current policy should be improved to encourage research and innovation in correlation with Solar Energy that is efficient and able to mitigate the unique challenges in tropical region.

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