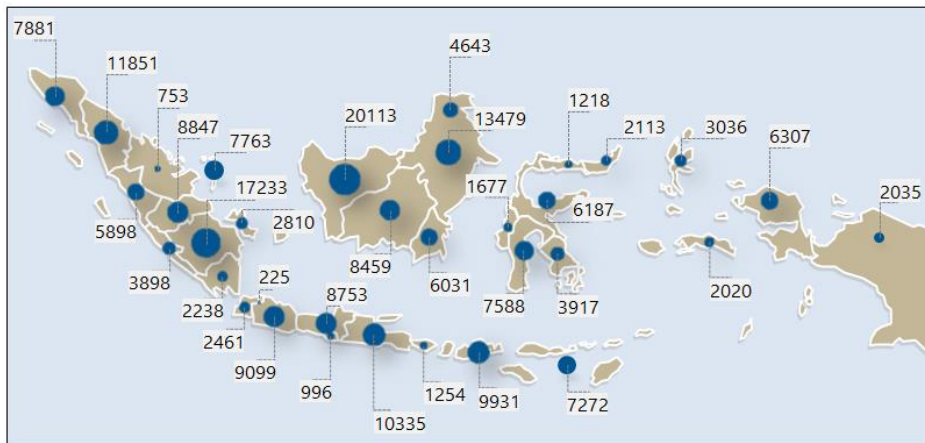


June 2, 2020

1. Potential of solar power generation

As Indonesia lies just below the equator line where the daylight is abundant, there is huge potential for solar power generation. The latest Indonesia National Energy Plan (RUEN [2017]) estimates solar power potential in the country as 207,898MW, which accounts for about half of the total renewable energy potential.



Solar power potential in Indonesia by region (Unit: MW)

Source: Made by Carbon Market Express based on RUEN [2017] data

In Indonesia, the National Energy Policy (KEN) [2014], which is a general policy on energy and electricity, stipulates the renewable energy mix (incl. hydrogen and nuclear energy, etc.) target of 23% by 2025 and 31% by 2050. The latest National Energy Plan (RUEN [2017]) and General Plan for National Electricity 2019-2038 (RUKN 2019-2038) based on the KEN [2014] estimate the amount of solar power generation needed to achieve the KEN's target at 6,500MW by 2025 and 45,000MW by 2050.

2. Status of solar power development

Indonesia's State Electricity Company (PLN) has announced the total amount of installed solar power generation to be 152MW as of November 2019, consisting of Ground-mounted type: 137MW / Roof-top type: 16MW and On-grid: 90MW / Off-grid: 62MW. Currently, the largest solar power plant in Indonesia is a 15MW ground-mounted solar power plant constructed in North Sulawesi Province in September 2019. Furthermore, the construction of a 145MW floating solar power plant is being considered in Cirata dam in West Java, the largest of its kind in

[Updates of policies]
Latest updates of energy policies

- RUEN (2017) in 2017
- RUKN2019-2038 in Aug. 2019
- RUPTL2019-2028 in Feb. 2019 (Updated annually)

[Targets of RUPTL]
RUPTL2019-2028 plans 908MW of solar power development by 2028. Planned capacity changes annually since it is based on latest economic growth rate. Therefore, latest target falls short of the target of RUEN/RUKN.

South-East Asia. In order to activate the solar power development towards achieving the targets set by national policies such as KEN and RUKN, the Government of Indonesia has been actively introducing incentive schemes to promote the introduction of solar power.

3. Existing JCM projects of solar power

In Indonesia, 37 JCM projects (incl. Model & Demonstration Projects) have been implemented so far, including 4 solar power generation projects. All of 4 projects mainly aims at captive consumption of generated electricity in their facilities and their power generation capacities are ranging from 0.5MW to 2MW.

[JCM Info. in Indonesia]
Information on the JCM related activities in Indonesia is also offered by [JCM Secretariat of Indonesia website](#).

[2MW Solar PV Power Plant Project in Jakabaring Sport City](#)

A solar power plant was installed at Jakabaring Sport City complex of South Sumatra Province to supply electricity in the sport city and supply surplus electricity to the grid. (Plant capacity was increased from 1.6MW as initially planned.)

[Introduction of 0.5MW Solar Power System to Aroma and Food Ingredients Factory](#)

A PV system was installed on the roof of Indesso Food Flavoring Factory located in Bogor, Indonesia and the generated electricity is consumed in the factory.

[Installation of Solar Power System and Storage Battery to Commercial Facility](#)

Solar power system (0.5MW) and storage batteries (100kW/111kWh) were installed in a large commercial facility to supply electricity to lighting equipment, while the surplus power during the day is charged to storage batteries for use at night

[Installation of Tribrid System to mobile communication's Base Transceiver Stations](#)

TRIBRID systems were installed at mobile communication's Base Transceiver Stations to control three types of power used in base stations (grid power / diesel power, photovoltaic power and storage batteries) according to the electricity load and the situations of electricity supply.

The share of solar power generation projects in Indonesia is thought to be small due to difficulties dealing with the electricity procurement scheme and project implementation requirements. The next chapter introduces related policies and recent trends of solar power development in Indonesia.

4. Policies and trends of solar power development in Indonesia

<Trend of renewable energy procurement scheme>

PLN serving as the single off-taker of on-grid power in Indonesia has been mandated by law to procure all the renewable energy from projects with a capacity of 10MW or less since 2006. The Feed-in Tariff (FIT) scheme for solar power generation was launched in 2016, however, procurement by PLN was inactive, and the bidding scheme replaced the FIT scheme in 2017. This tender system is adopting Build-Own-Operate-Transfer (BOOT) scheme which obligates Independent Power Producers (IPPs) to transfer projects to PLN at the end of the 20-year term of the Power Purchase Agreement (PPA). In addition, the upper limit of the procurement price is set low, which tends to prolong the payback period of renewable energy projects and has been a factor in reducing the bankability of most types of renewable energy projects in Indonesia.

Since then, the procurement scheme has been frequently revised, and MEMR Regulation No.4/2020 announced in March 2020 abolished the conventional BOOT scheme by replacing it with Build-Own-Operate (BOO) scheme for renewable energy projects with a capacity of 10MW or less, and the transfer of equipment to PLN after the PPA contract period is no longer required.

Furthermore, the regulation changed the selection process of IPPs for the solar power sector from "Direct selection" to "Direct appointment", allowing PLN to appoint a specific IPP without going through a bidding process, which is expected to stimulate future project development.

<Promotion measures for Roof-top solar power generation>

In September 2017, the "One Million Rooftop Solar Initiative (GNSSA)" was launched by MEMR and other agencies to promote roof-top solar power projects in residential, commercial facilities, public facilities and industrial parks, with a target of installing 1GW roof-top solar by 2020. Accordingly, MEMR Ordinance No.49 of November 2018 stipulates the general procedures for PLN's customers to install roof-top solar power systems and introduces the requirements for application/approval to PLNs for the construction and installation of roof-top solar power plants, and also introduced the net-metering scheme that allows them to sell surplus power to PLN. However, progress on GNSSA and net-metering scheme have been slow. Under the net-metering scheme, surplus power exported to PLN is valued as low as 65% of imported power. This low pricing is causing longer payback period of 7-8 years according to some studies, which is a barrier to entry by operator to use the scheme.

[Pricing rule of selling price]

BPP < National average power generation cost
-> Negotiation with PLN
BPP < National average power generation cost
-> Max price = 85% of BPP
*BPP = Power generation cost by PLN in the area

[Amendments history]

MEMR Reg. No.50/2017
1st amendment:
MEMR Reg. No.53/2018
2nd amendment:
MEMR Reg. No.4/2020

[Amendments history]

MEMR Reg. No.13 and No.16 were announced in 2019 to make more user-friendly scheme.
e.g. Scale of power plant needs Operating License was raised (from <200kVA to <500 kVA, reduction of capacity charge for power plant owner.

<Local Content Requirements (TKDN) on solar power sector>

Since 2010, Indonesia has introduced Local Content Requirements (TKDN) for electricity infrastructure such as power plant, transmission grids and distribution grids that require the use of local products and services. Also, Ordinance No.5 of Ministry of Industry stipulates that the minimum local content ratio for solar panels will be increased at 40% by 2017, followed by 50% in 2018 and 60% by 2019.

However, currently, solar panels and other products manufactured in Indonesia are less competitive in terms of price and quality than products made by foreign manufacturers, and installation cost using domestic products can be 20-40% higher in some cases. Considering this situation, MEMR as supervising ministry has kept the procurement ratio unchanged at 40% pending an increase based on requests from stakeholders. Besides the regulation itself, TKDN may not be fully applied to all projects in actual operation. Even so, the regulations may be strengthened in the future, so it is necessary to carefully pay attention on future changes of regulation as well as operation. In addition, some relevant industry groups such as Indonesia Solar Energy Association (AESI) and Indonesia Solar System Producer Association (APAMSI) are actively involved in these issue.

[Regulations on TKDN]
- MOI Reg. No.54/2012 defines minimum thresholds of local content requirement by product types
- MOI Reg. No.5/2017 amended the requirements for solar power project
- MOI Reg. No.4/2017 defines calculation method of local content

5. JCM Financial Support Scheme

Recognizing the huge potential of solar power in Indonesia, the government had set targets for the introduction of renewable energy, and has been implementing series of incentive policies on solar power development. It is noteworthy that in recent years, the system has been frequently modified to improve the low bankability and usability issues caused by the relevant schemes of solar power sector. It is important for project developer to keep an eye on the ongoing and possible changes in the future.

In addition, the JCM Financial Support Scheme can reduce part of the investment cost for introducing low/decarbonized carbon technologies and shorten the payback period of projects, so it can be a major incentive for implementing solar power projects in Indonesia. The [Financing Programme for JCM Model Projects in FY2020](#), is currently open for proposals, and it can be an option for entities who are considering solar power project development in Indonesia.

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