



Indonesia Clean Energy Outlook Reviewing 2018, Outlooking 2019



Imprint

Indonesia Clean Energy Outlook

Reviewing 2018, Outlooking 2019

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75 MW Sidenreng Rappang (Sidrap) Wind Farm, South Sulawesi
Photo by MEMR



2018 Clean Energy Development Highlights

- **The inauguration of first wind farm in Indonesia, PLTB Sidrap I**, in July 2018. The wind farm will generate 75 MW of electricity and deliver power to 70,000 households in South Sulawesi. Other projects that have reached COD are Karaha Unit I (30 MW) in West Java and Sarulla Unit III (110 MW) in North Sumatera. These three projects were not part of 70 PPAs signed in 2017.
- **The inauguration of first biomass power plant in West Kalimantan, PLTBm Siantan**, in September 2018. The power plant has a capacity of 15 MW.
- **Low realization of renewable energy investment.** By September 2018, renewables investments only reached USD 1.16 billion, reaching 57.7% of 2018 target at USD 2.01 billion.
- By November 2018, **32 of 70 projects signed in 2017 have not reached financial close**, 6 projects just obtained financial close, 28 projects are under construction, and 4 renewables projects are fully operational. By November 2018, there have only been 4 new PPAs signed in 2018.



2018 Clean Energy Development Highlights

- **Delay in PLTS Cirata project.** Previously, PLN directly appointed Masdar from UAE to develop floating solar PV project in Cirata, West Java, which will add 200 MW into the network with project value at USD 300 million. The PPA, however, was canceled to hinder lawsuit in the future (because **the appointment process was not transparent and inconsistent with MEMR Reg. No. 50 which requires solar projects to be procured through direct selection based on capacity quota**) as well as to get the most competitive tariffs the IPPs can offer. Currently there are three potential investors from Korea, China, and UEA (Masdar) which compete to develop the Cirata project.
- **Delays in operation of three geothermal projects: Lumut Balai, Sorik Marapi and Sokoria,** with total capacity of 90 MW. These three projects were expected to start delivering power into the grid in August and December 2018 but delayed to 2019. The postponement was caused by delays in transmission construction undertaken by PLN.
- **PT Pertamina Geothermal Energy (PGE) revised its geothermal development target from 2100 MW to 1120 MW in 2025.** PGE will also not reach its \$277 million investment target in 2018 due to delays in drilling of some geothermal wells such as in Lahendong and Tompasso and delays in construction of Lumut Balai Unit I. In general, investments in geothermal energy experienced a slowdown in 2018.



Renewables Development Progress in 2018

PPA Progress

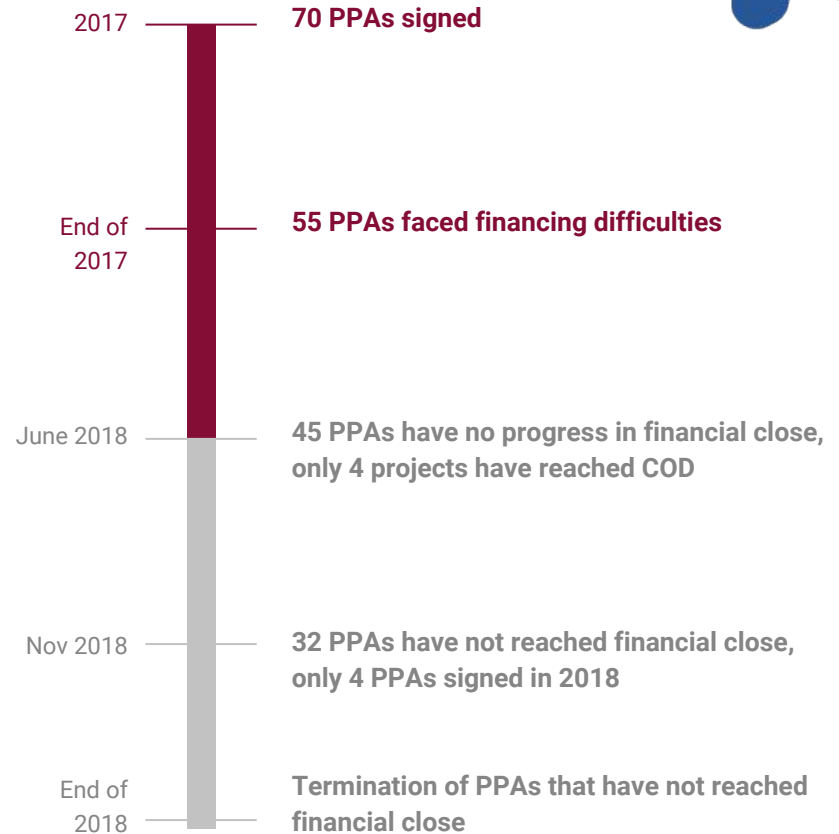
Status of Renewables
Development

Solar Power Development

Rooftop PV

Record-high number of PPA signed in 2017 but little progress in financial close

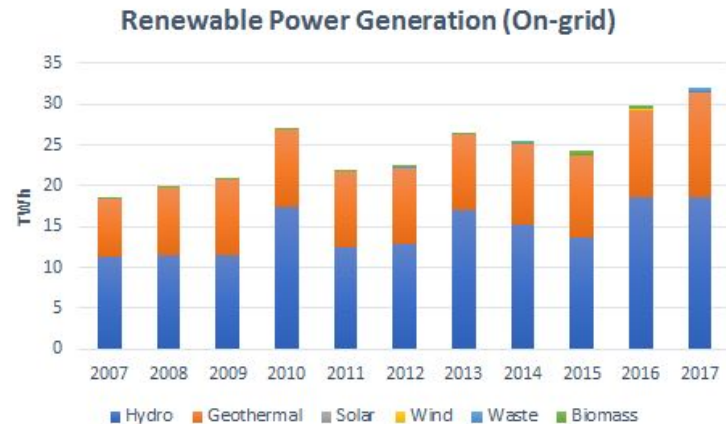
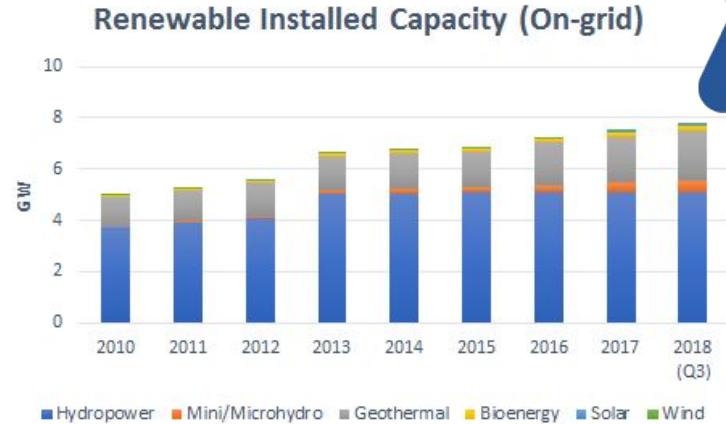
- MEMR recorded 70 PPAs signed in 2017 which will add 1214 MW of renewables into the network. The ministry claimed that this was the country's record-high number of PPAs signed in a year.
- By the end of 2017, 55 of 70 PPAs faced financing difficulties. By June 2018, only 4 projects had reached COD, while the other 45 PPAs had made no progress in getting financial close (PwC, 2018).
- By November 2018, 32 PPAs had not reached financial close (PLN, 2018) and only 4 PPAs had been signed in 2018 with total capacity of 361.9 MW (a 350 MW project and three other small projects).
- Tariffs, risk allocation, and BOOT scheme are deemed as main factors that make PPAs not bankable.





7.8 GW of on-grid renewables, small hydro and geothermal grow faster

- Total renewables installed capacity in 2018 was 9.4 GW, 83% was on grid. Around 66% of the on-grid renewable power plants in 2018 were large hydro power. Geothermal, small hydro, and bioenergy contributed 25%, 5%, and 3% respectively, while solar and wind each contributed less than 1% of total capacity.
- According to the National Energy Plan (RUEN), renewables should comprise 33% of total power plant capacity by 2025 (around 45.2 GW). However, the 2018-2027 RUPTL only plans 14.3 GW of renewables plants out of 51.8 GW of new plants planned until 2025, much lower than RUEN target.
- In term of generation, the share of renewables has been locked between 11-13% since 2007 with no sign of improvement. The 2018 RUPTL projects a 23% renewables share in electricity generation in 2025, increasing from 14% in 2024.

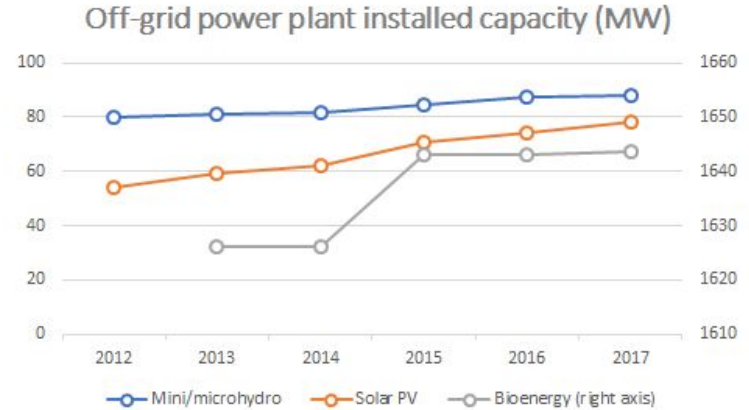


Data Source: : Lakin ESDM 2013-2017



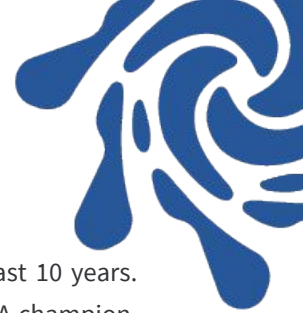
Off-grid renewables growth has been slowing down

- The growth in off-grid solar PV and micro-hydro power plants has been slowing down over years. Although there is ample opportunity to electrify rural areas by using off-grid renewables systems, Indonesia has no regulations that specifically opt for development off-grid renewables. PLN is still using the same approach by extending the grid to electrify rural areas, which is more expensive than using distributed renewables.
- Around 90% of bioenergy power plants in Indonesia are off-grid. By 2017, the off-grid bioenergy (biogas, biomass, and waste) power plants contributed to 18% of total renewable power plants in the country while the growth in off-grid solar PV and mini/microhydro power plants was decent.
- The 2018-2037 RUKN (draft) aims to reduce the oil share in electricity generation to maximum 1% in 2025. In 2017, Indonesia had 2.5 GW of diesel power plants which generated 18.5 GWh of electricity, counting for 7% of total generation in that year.



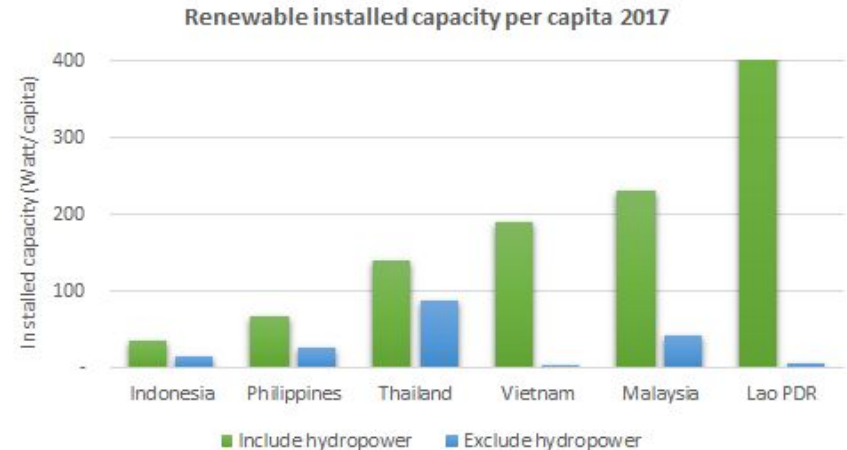
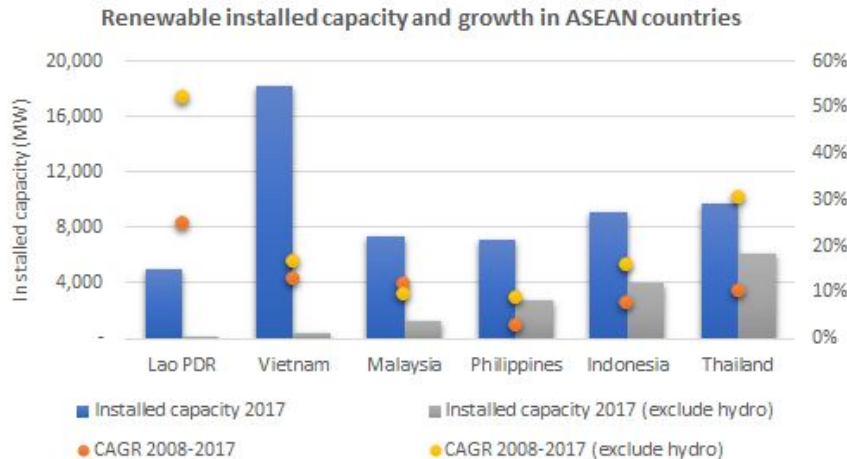
Data Source : Lakin ESDM 2013-2017

1.643 MW Bioenergy 79 MW Solar PV 88 MW Mini/micro-hydro



Thailand first, Indonesia second, among South East Asian (SEA) countries in non-hydro renewables

- Vietnam has the highest renewables installed capacity in SEA while Lao PDR has seen largest growth of renewables for the last 10 years. Hydropower comprises more than 90% of renewables capacity in both countries. For non-hydro renewables, Thailand is the SEA champion, followed by Indonesia. When it comes to renewables capacity per capita, Indonesia is far behind the neighboring countries with having only 35 Watts/capita for all renewables and 15 Watts/capita for non-hydro renewables.



Data Source: Handbook of Energy & Economic Statistics of Indonesia 2018, IRENA Renewable Energy Statistics 2018

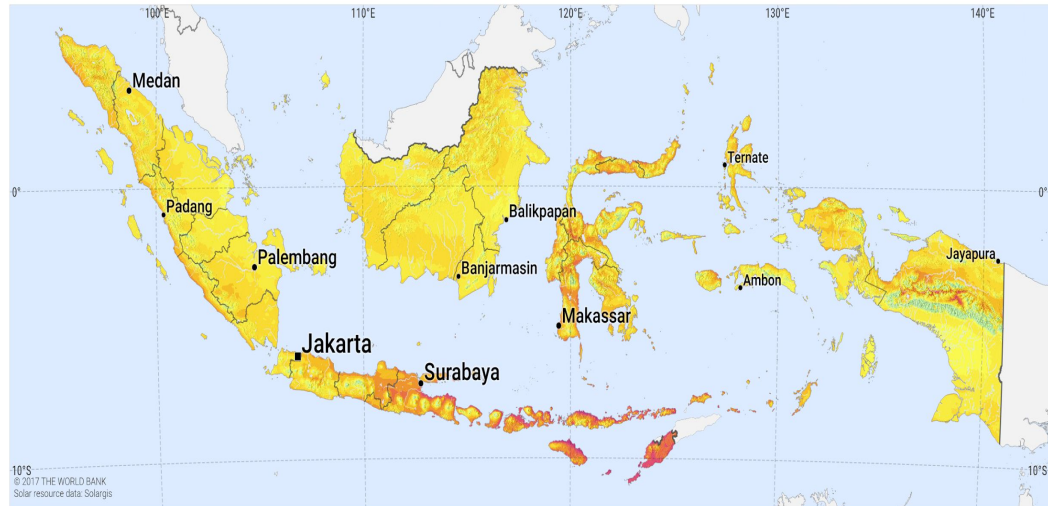
Sluggish development despite huge solar energy potential



SOLAR RESOURCE MAP

PHOTOVOLTAIC POWER POTENTIAL

INDONESIA



Long term average of PVO_{UT}, period from 2007 (1999 in the West) to 2016



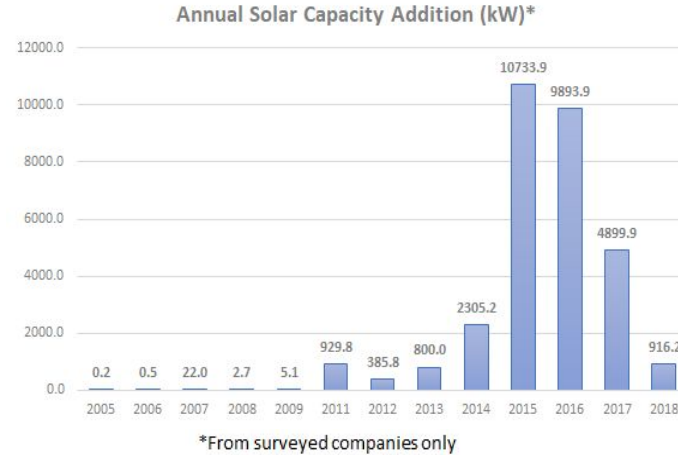
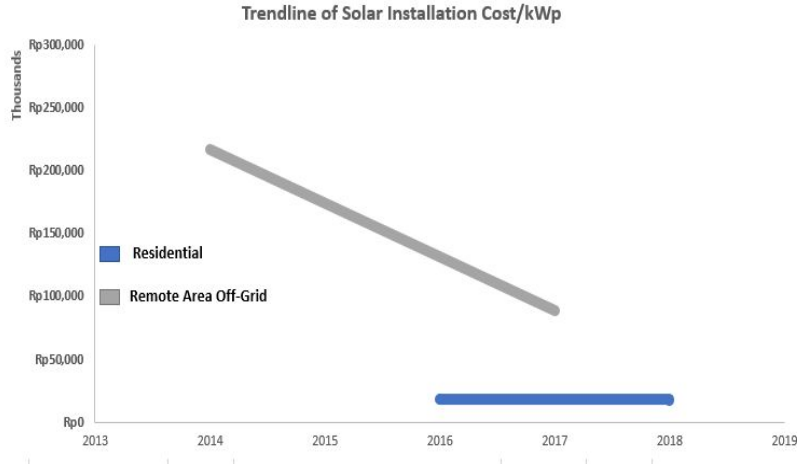
This map is published by the World Bank Group, funded by ESMAP, and prepared by Solargis. For more information and terms of use, please visit <http://global.solaratlas.info>



- Indonesia has huge solar energy potential, counting for more than 500 GW and the largest compared to other renewables resources the country has. IRENA estimated that Indonesia could develop up to 3.1 GW of solar energy per year from 2016 to 2030 and attain 47 GW of solar capacity in 2030 which is sufficient to meet RUEN target.
- By the end of 2017, only 90 MW of solar energy had been installed.
- Although incorporated in RUEN as one of strategies to develop solar power, rooftop solar PV remains to play small role in the Indonesian power sector.
- By June 2018, Indonesia had only installed 521 kWp of residential, 5 kWp of social, and 1080 kWp of industrial rooftop solar PV (PPLSA, 2018).
- In terms of technology costs, Indonesia has comparable LCOE to neighbouring countries, at USD 0.06 - 0.11 per kWh compared to Thailand at USD 0.07 - 0.12 per kWh (Mott MacDonald, 2017)

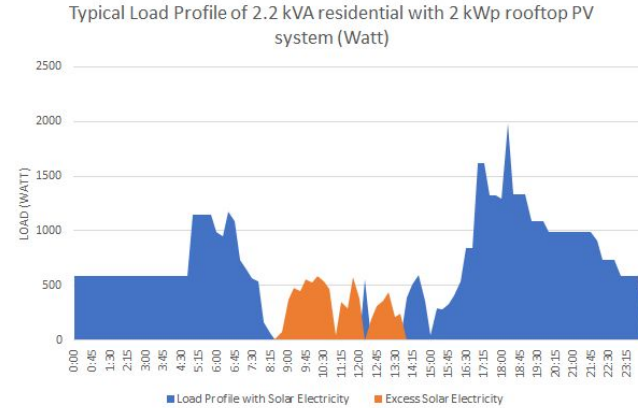
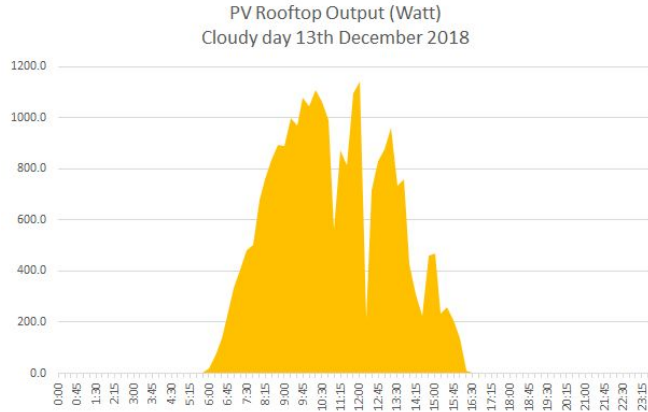


Despite declining costs, solar PV growth is slowing



- While the trends show the declining costs of solar PV, the annual capacity addition in solar PV development in Indonesia has been plummeting from around 11 MW in 2015 to 916 kW in 2018. The average installation costs for residential rooftop solar PV have been stagnant for the last three years at around IDR 18 million/kWp. Meanwhile, the average off-grid installation costs of off-grid solar PV have dropped significantly from around IDR 330 million/kWp in 2014 to IDR 98 million/kWp in 2017. The costs of off-grid installation depend on the logistic and battery costs. Most solar PV in Indonesia is ground-mounted type and used for off-grid rural electrification (around 54%).

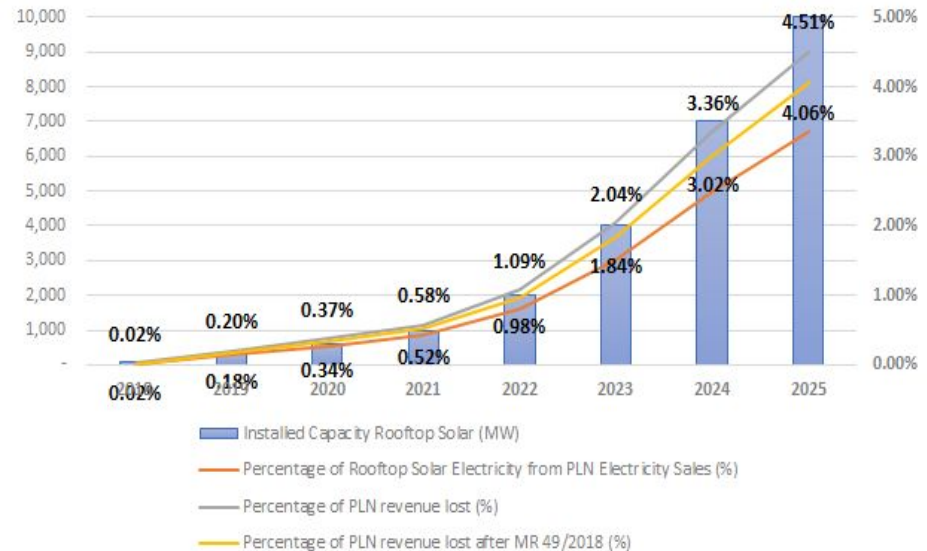
30% instead of 10% of rooftop solar PV electricity fed into the grid



- A market survey on rooftop solar PV installation conducted by GIZ and IESR in 2018 shows that 13% of households (>1.3 kVA) in Jabodetabek areas are interested to install rooftop solar PV, counting for 368 MW of installed capacity. Around 79% of respondents expect a payback period of less than 7 years.
- Our simulation of a 2.2 kVA grid connected house with a 2 kWp rooftop PV system shows that on average the system will export 30% of electricity generated into the network, including on cloudy and rainy days when the capacity factor only reaches 13%. The exported electricity can increase significantly to 42 - 49% on a very sunny day (capacity factor > 17%). The simulation was executed with assumptions that a typical household load in Indonesia is dominated by cooling appliances (>39% from air conditioner and electric fan) followed by refrigerator (17%) and entertainment (15%) and the peak load happens at 6 - 7 pm.
- The assumption PLN made that only 10% of electricity generated by rooftop solar PV is fed into the grid and therefore the rooftop solar PV utilization is only for “lifestyle” not for economic reasons is then contestable.

Fears of losing revenues, PLN is perceived as unfavored of rooftop solar PV

- RUEN mandates 45 GW of renewables installed capacity by 2025, of which 6.5 GW should come from solar power plants. Much of this target can be met with the development of rooftop solar PV in the country.
- The Regulation 49 stipulates that PLN will only compensate 65% of rooftop solar PV electricity exported into the grid. Stakeholders see this as a setback for the rooftop solar PV development in Indonesia and the regulation only aims to prevent PLN from losing revenues as more consumers use the system on their rooftops.
- The fears of losing revenues, however, are unfounded. By assuming there will be 1 GW of rooftop solar PV by 2020, we calculated that PLN revenues will be only declining by 0.58%, a negligible reduction compared to benefits it brings to the country. When the new regulation is applied to the calculation, PLN revenue is reduced by only 0.52%.
- With the new net metering scheme is seen unattractive and the battery costs continue to decline, a system of rooftop solar PV with batteries will become a more viable option for PLN consumers. When this happens, PLN is expected to see more rapid decline in electricity sales. PLN, therefore, needs to consider this in its business plan or find new business models to mitigate the risk.





Updates on Regulatory Framework

Regulatory Changes and
Issuances in 2018

Regulation Highlights

Regulatory changes and issuances in 2018



General

- Permen 9 : Revocation of obsolete regulations
- Permen 10 : Power purchase agreement (amended Permen 10/2017)
- Permen 12 : Renewable/ energy efficiency projects by MEMR (amended Permen 39/2017)
- Permen 36 : Special fund for small scale energy (replaced Permen 3/2017)
- Permen 47 : Power pricing procedure for owner of business area (Wilayah Usaha)

Solar

- Permen 5 : Low energy solar lights provision (amended Permen 33/2017)
- Permen 49 : Rooftop solar PV for PLN consumers

Geothermal

- Permen 33 : Geothermal data and information management and utilization
- Permen 37 : Geothermal working area, permit, and development assignment

Bioenergy

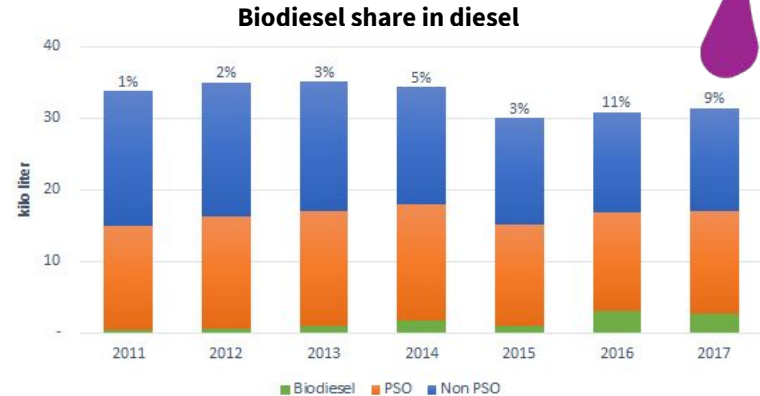
- Perpres 66 : Palm plantation fund (amended Perpres 61/2015)
- Permen 41 : Biodiesel supply
- Permen 45 : Biodiesel supply (amended Permen 41/2018)
- Perpres 35 : Acceleration of MSW power plant

Pres. Reg No. 66/2018: Subsidy for non PSO to boost B20 program

Biodiesel blending program was introduced in 2015 through MEMR Reg No. 12, targeting 20% blending in 2016 for transportation and industrial use. Through Presidential Regulation 61/2015, the price gap between diesel fuel and biodiesel in PSO sector is subsidized by CPO export duty. Biodiesel share jumped to 10.8% in 2016 from only 2.6% in 2015. However, the B20 mandate had only been implemented to the subsidized PSO sector, with 86% of biodiesel consumption was from this sector in 2016 (Dharmawan et al. 2018).

In September 2018, the government expanded the subsidy scheme to Non PSO through Presidential Regulation No.66/2018. The new scheme has doubled the biodiesel consumption in Q4 of 2018. The government even seeks to speed up the implementation of B30 policy in 2019, from the initial plan in 2020.

Ministerial Decree	Period	PSO (kL)	Non PSO (kL)
3756 K/10/MEM/2017	Nov 2017-Apr 2018	1,407,778	
1803 K/10/MEM/2018	Mei-Okt 2018	1,456,966	
1935 K/10/MEM/2018	Mei-Des 2018	1,950,205	
1936 K/10/MEM/2018	Sep-Des 2018		940,407
2018 K/10/MEM/2018	Jan-Des 2019	6,197,101	



Data Source: bphmgas.go.id, Handbook of Energy & Economic Statistics of Indonesia 2018

This move was partly induced by the drop in crude palm oil demand from international buyers due to environmental and social issues, particularly ban of Indonesian biodiesel by EU which caused CPO price to plummet. The increase in global crude oil prices have also pushed the government to replace imported diesel with biodiesel to reduce trade deficit.

There is, however, a heated debate on the impact of biodiesel on industrial and heavy duty vehicles. The subsidy scheme is also deemed unsustainable, since the fund source will be rapidly depleted due to increasing domestic use and decreasing CPO price.

Pres. Reg No. 35/2018: 13.35 ct/kWh, a burden for PLN consumers



This regulation is the replacement of Pres. Reg No. 18/2016 that was annulled by the Supreme Court in January 2017. According to this regulation, waste to energy (WTE) plants in 12 cities with severe waste problems will get special pricing at 13.35 cents/kWh for the electricity they generate. This price is about twice the prices defined in MEMR Reg No. 50/2017.



Delays in PPA signing

Since the stipulation of the regulation, no WTE PPA has been signed yet. A project in Solo, for instance, has been delayed several times, waiting for the PPA to be signed by PLN. One WTE plant in Bekasi has been in operation since late 2017 but having yet to connect to the grid due to delayed PPA.



Costly technology

A WTE plant is costly. One planned project in Sunter, Jakarta agreed on an IDR 500,000 tipping fee, much higher than the standard tipping fee of IDR 150,000 currently charged for landfill. On top of that, PLN also has to pay for the electricity produced at high tariffs. As a result, PLN's consumers will pay more for the technology.



Shortcut solution

Some environmental organizations criticized the regulation and believed that this is only a shortcut solution for the government to deal with chronic waste problems in Indonesia. The argument says that if the government wants to reduce waste production, the cost of WTE plants should be mostly imposed on the tipping fee. This would likely discourage people to produce more waste. There is also a concern on the impact of WTE plants on health.

MEMR Reg No.49/2018: Long awaited regulation of rooftop PV failed to meet expectations



Stakeholders have expressed their disappointments since the release of the Ministerial Regulation on rooftop solar power system. The new regulation is perceived as a way to discourage the mass use of rooftop solar PV despite the huge potential of this technology as low-hanging fruit to meet the 23% renewables target.

PLN officials suggested that the rooftop PV is mainly for regions with unreliable power supply instead of major cities in Java. However, with no differentiation in electricity tariffs, users in remote areas will be put in a disadvantageous position as they will get less compensation (and longer payback period) compared to users in big cities as the solar PV prices are higher in remote areas due to logistic costs.



Unattractive scheme

PLN will only compensate 65% of electricity exported by rooftop solar PV, much smaller than the expected 1:1 scheme. This results in a longer payback period of 11 - 12 years, compared to 7-8 years under 1:1 scheme. Additionally, there are capacity charge and emergency charge for industrial users.



Capacity cap

The rooftop solar PV system cannot exceed grid-tied capacity.



Quarterly restart

The electricity exported will offset the import. If export is higher than import, the balance can be accumulated up to 3 months before being nullified. Under previous PLN regulation, the balance was restarted annually.



Transparency

If the application for net metering scheme is rejected, PLN is not obliged to disclose the reason of rejection. Moreover, PLN is also not required to install the net metering within specific time once the application is approved. PLN, however, has to install the metering device within 15 days after the applicant submits fit for operation certificate.

MEMR Reg. No. 10/2018: Improvements on PPA regulation but some risks to private investors



MR No.10/2017

Negatively viewed by private players: BOOT scheme, risk allocation, tougher penalties, restricted transfer of ownership before COD.



MR No.49/2017

More positive response:
Revocation of government force majeure.



MR No.10/2018

Revocation of changes in law and regulation force majeure.

The Ministry Regulation No.10/2018 which amended the Ministry Regulation No.10/2017 revokes the government force majeure (FM) from the clauses, providing more contract certainty for IPPs. However, other major issues such as the risk allocation of natural FM, BOOT scheme, and penalty for IPPs remain. At this situation, PLN is not required to pay termination payments when natural FM causes long-term interruptions. PLN, instead, may extend the PPA by the length of time of disaster. Nevertheless, it is important to note that this regulation excludes the intermittent renewables (solar and wind), small hydro (<10 MW), biogas, and waste to energy power plants.

MEMR Reg No.50/2017: Lower tariffs for renewables



After the issuance of MEMR Reg. No. 12/2017, the renewables tariffs were started to be capped at 85% of PLN generation cost (BPP). Under the MEMR Reg. No. 50/2017, when local BPP is higher than national BPP, geothermal and WTE power plants will get tariffs at maximum 100% of local BPP while the other renewables will be 85% of local BPP. Meanwhile, when local BPP is lower than national BPP, tariffs will be based on business-to-business agreement. The Regulation 50 provides lower tariffs for renewables compared to previous regulations where the FIT scheme was used. Issued by the end of 2017, the regulation has been seen as one of main factors that negatively impacts the bankability of renewables projects in Indonesia.



Low tariff in Java-Bali grid

The low BPP makes renewables development in Java-Bali unattractive. The slow renewables development in these regions will likely cause the country miss its renewables target, as 80% of electricity demand in Indonesia is in Java-Bali.



BOOT scheme for all renewables

MEMR Reg No. 10/2017 introduced BOOT scheme for geothermal, large hydro, and biomass power plants. MEMR Reg No. 50/2017 requires all types of renewables to follow the BOOT scheme.

With the BOOT scheme, the power plant assets cannot be used as collateral. The small IPPs then face difficulties to get financing because they do not have assets that can be used as collateral.



BPP does not reflect the true cost of generation

It is unclear how PLN calculates the BPP. For example, several power plants were funded by grants, which reduce significantly the generation cost of the power plant.

The coal price cap introduced in early 2018 (MEMR Decree 1395K/30/MEM/2018) will also push down the BPP and put renewables at a disadvantage.



Renewable Finance Issues

IPP Perspective

Financial Institution Perspective

Renewables Finance in Indonesia



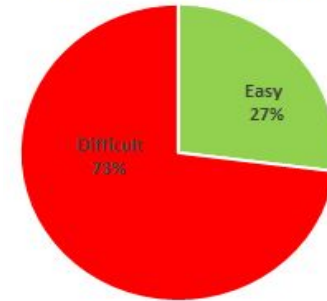
Different perceptions between IPPs and lenders of problems with renewables financing

IPPs	Lenders
Difficult to get finance, particularly for small scale (<10 MW) projects.	Finance is always available, bankable projects are not
Interest rates are too high	Unreputable and inexperienced sponsor and poor FS increase perceived risks, resulting high interest rates
No project finance, collaterals are too high	Local banks have no experience and capacity in renewables projects, cannot provide project finance
Tariffs are too low	Tariff is important but not the primary factor defining the bankability. The quality of project and project sponsor are the most important factors.

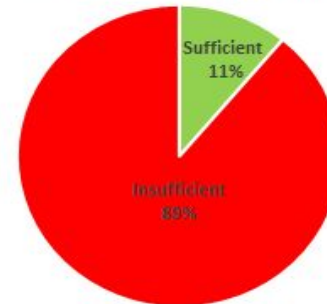
Most IPPs find difficulty in getting renewables finance

- From 11 IPPs surveyed, 73% agreed that securing finance for renewables projects in Indonesia is difficult. Local banks still perceive renewables projects as risky, thus require high interest rates for the projects. For small-scale developers, the collateral requirement (typically 120% - 140% of project costs) is difficult to fulfill and the need to have a creditworthy project sponsor is challenging to meet. Debt to equity ranges from 60:40 to 70:30 and local banks rarely offer project finance for both large and small scale renewables projects.
- 90% of IPPs surveyed considered current regulatory framework for renewables finance insufficient to incentivize renewables development in Indonesia. For instance, current tariffs benchmarked against the cost of generation (BPP) are deemed discriminatory as coal which dominates the electricity production in Indonesia receives subsidies and price interventions (price cap at USD 70), making the BPP lower than it should have been and creating unlevel playing field for renewables.
- The majority of IPPs surveyed were also pessimistic that the trends will be getting better in 2019. Considering the presidential election that will be held in 2019, many IPPs predict that there will be no fundamental changes next year. The IPPs, thus, tend to wait and see.

Ease of Getting Finance



Regulatory Framework





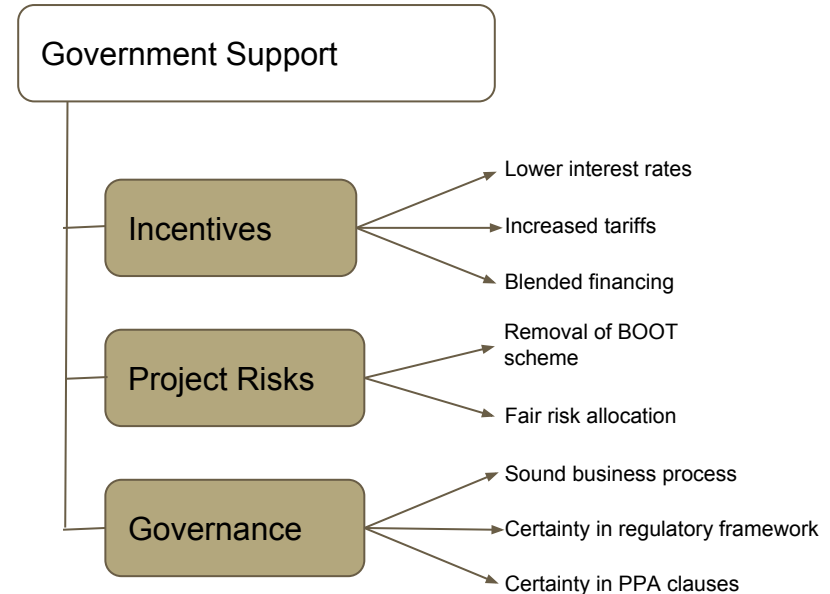
IPPs: finance is not the main issue, business process is

- Our survey with IPPs reveals that finance is not the primary issue for the renewables projects in Indonesia. Instead, the unclear, inconsistent business processes are seen as the core problem that prevent the projects from getting finance. One developer provided an example of how tariffs for geothermal energy can be uncertain. Under MEMR Reg. No. 50/2017 tariffs for geothermal-based electricity are capped at 100% BPP but recently PLN was circulating a new rule that caps tariffs for geothermal-based electricity at 85% BPP. The inconsistency between PLN and government rules raises questions and confusion among project developers and investors.
- The frequent regulatory changes happened in the past two years also sent negative signal to the market. The decision to use BOOT scheme and change in risk allocation, for instances, have directly affected the business process of renewables projects in the country. The uncertainty has discouraged lenders to invest in renewables projects.
- Another example comes from waste to energy (wte) industry, where the government recently released Presidential Regulation (PR) No. 35/2018 on the acceleration of development of wte projects. Under this regulation, twelve cities will enjoy a new single Feed-in-Tariff (FIT) for wte projects developed in those cities. A tariff at 13.35 cents USD/kWh will be given to projects of up to 20 MW, while for projects bigger than 20 MW will obtain $14.54 - (0.076 \times \text{capacity})$ cents USD/kWh. Considering that PR has a higher rank than MEMR Regulation, PLN has to follow the Regulation 35/2018. In practice, however, PLN insists to pay developers according to MEMR Regulation No. 50/2017 (which generally provides lower tariffs than Regulation 35). This has caused a tough negotiation between PLN and wte developers, lengthening the PPA process and increasing uncertainty in business process.



IPPs require government support

- Most IPPs surveyed believed that renewables development can be accelerated if the government steps in and takes measures to improve the investment climate in the sector. IPPs perceived that the government has been showing its willingness to develop renewables but at no cost.
- There are at least three areas that can help improve the investment climate according to IPPs surveyed. *First*, incentives for renewables to lower interest rates (less than 10%), an increase in renewables tariffs, and the provision of blended financing. *Second*, government support to lower project risks by removing the BOOT scheme and fair risk allocation. *Third*, good governance that ensures sound business process and certainty in regulatory framework and PPA clauses (tariffs and currency).





Financial institutions: lack of bankable projects hinders access to finance

- Our interviews with financial firms reveal that there is no lack of finance for renewable projects. There is, however, a lack of bankable renewables projects to finance. The bankability of renewables projects in Indonesia is mainly hampered by unattractive tariffs, Build-Own-Operate-Transfer (BOOT) scheme, and risk allocation.
- In many cases, however, IPPs submitted low quality Feasibility Studies (FS) to lenders. This has been one of the main causes of many PPAs signed in 2017 have not reached financial close. In addition to quality FS, lenders also require reputable and experienced sponsors to guarantee credits provided by lenders, which are difficult to access by small-scale developers.
- While most financial institutions interviewed agreed that tariff is not the primary factor defining a project bankability, they admitted that the current tariff is unattractive, thus makes renewables projects difficult to build in low-BPP areas such as Java and Bali. However, a project can still be made bankable, for example by offering a longer tenor to IPPs, so that renewables projects are viable and IPPs will still obtain a decent profit. Currently, only international lenders can provide a longer tenor to IPPs, as long as the risk allocation between IPPs and offtaker is balanced.
- The BOOT scheme has raised objections from IPPs as they usually use their assets as collaterals. When IPPs fail to repay the loan, lenders cannot recover it through the assets (collaterals) as the assets belong to PLN. In addition, the option to factor in the land costs in the contract is deemed difficult considering that PLN caps the tariffs at 85% of BPP.
- Under MEMR Reg. No. 10/2018, PLN and IPPs share a risk if natural Force Majeure (natural disaster) happens and prevents PLN from taking power from IPPs. At this situation, PLN is not required to pay termination payments when natural FM causes long-term interruptions. PLN, instead, may extend the PPA by the length of time of disaster. The banks perceive this clause as troublesome as they need regular debt payments from project cash flow. The option to use an insurance to mitigate this risk is deemed impractical, as it will likely increase the project costs and thus tariffs. The premium is also difficult to claim. One financial institution interviewed mentioned that the risk allocation is the main problem which prevents projects from getting finance.

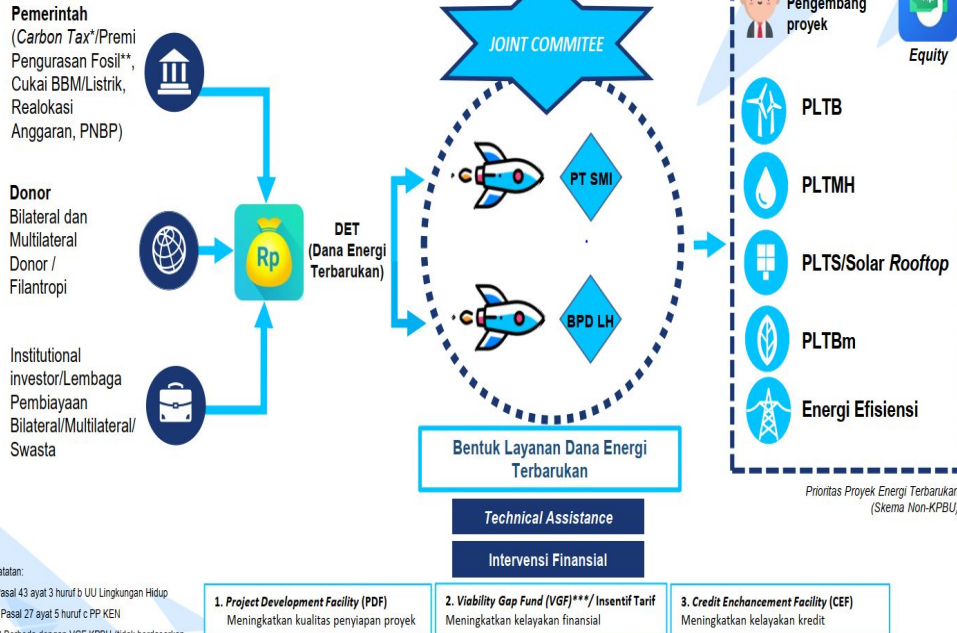
Perceived risks increase financing costs of renewables projects



- The bankability issues together with uncertain regulatory framework have increased the perceived risks of renewables projects which naturally increase the interest rates charged by lenders to IPPs.
- Local banks currently do not provide project finance for renewables projects as they do not have the experience and capacity to assess the risks of renewables projects. The banks do not see the urgency to build such capacity as the renewables industry is still considered small in the country. The unfamiliarity with renewables projects also contributes to the low participation of local banks in renewables development in the country.

Renewable Energy Fund will give hope for renewables in Indonesia

Framework Dana Energi Terbarukan



Catatan:
*Pasal 43 ayat 3 huruf b UU Lingkungan Hidup
** Pasal 27 ayat 5 huruf c PP KEN
*** Berbeda dengan VGF KPBU tidak berdasarkan

Source: BKF, 2018

- Interviews conducted by IESR with financial institutions reveal that government support can help reduce project risks.
- The Fiscal Policy Agency (BKF) has carried out a study of *Dana Energi Terbarukan* (DET) or Renewable Energy Fund as a source of fund to help reduce projects risks as well as finance renewables projects.
- The DET aims to offset the insufficient 85% BPP tariffs, cover project risks and high-transaction costs of renewables projects through the provision of Viability Gap Fund (VGF), Project Development Funding (PDF), and Credit Enhancement Facility (CEF).
- The funding sources of DET will come from carbon tax, fossil tax, fossil fuel tax, surcharge, subsidy, and also grants from international donors.



Legal framework and institutional capacity are deemed as main challenges to implement DET

- The idea to collect taxes from fossil fuels such as coal and oil will likely be stumbled by the legal framework. No regulations are currently in place to allow its implementation.
- METI sees BKF's proposal to put the fund in the Environmental Fund Management Agency or Badan Pengelolaan Dana Lingkungan Hidup (BPD LH) controlled by the Ministry of Environment and Forestry could create competition between the renewables and land use agendas.
- The proposal to use PT SMI as the creditor, which will disburse the fund to target groups, has also prompted a question about PT SMI's capability in playing this role. Many perceive PT SMI lacks the experience and capacity in renewables projects. The lack of resources to assess all potential projects at the same time would also be a concern for PT SMI.

PT SMI	BPD LH
Experience in structuring projects and providing funding (+)	Under government control (+)
Capable in collecting domestic and international funding (+)	High governance standard aligned with laws of Public Service Agency (BLU) and state finance (+)
Accredited by Green Climate Fund (+)	Flexibility in issuing financial instruments (+)
Technical support from international organizations (+)	Current donors prioritize land use issue not energy issues (-)
Flexible financial instruments (+)	Limited capability in derisking (-)
Transaction costs for small-scale projects are not economical (-)	
Susceptible to risks of renewables projects (-)	
Small portfolio in renewables sector (-)	

Source: BKF, 2018

PT SMI is confident with its capacity in managing DET



- A different view comes from PT SMI which believes in its capability and capacity to handle future renewable energy fund (DET). Answering the doubt on its experience in renewables projects, PT SMI asserted that it has been financing minihydro and wind projects since 2015 and continuously diversifying its renewables portfolio ever since.
- PT SMI has also been entrusted to manage fund from bilateral and multilateral institutions. On October 5, 2018, the Ministry of Finance (MoF) launched the SDG Indonesia One platform which will be managed by PT SMI to provide a blended finance scheme for infrastructure development oriented toward Sustainable Development Goals (SDG) in Indonesia. The trust given to the company has proven its capacity in managing such funding.
- The company has also established its Sustainable Finance division aims to handle sustainable projects, including renewables projects. The concern on PT SMI's human resources to assess potential projects at the same time, therefore, would be easily solved by expanding its team.



2019 Outlook

Clean Energy Outlook 2019

A Way Forward

Note



Low investment in renewables is expected despite increased urgency for energy transition

- IPCC reported in October 2018 that limiting global warming to 1.5oC instead of 2oC will avoid us from various catastrophic impacts, requiring **more aggressive transition** of the energy sector to renewable energy. This will put more pressure on the regulators to support energy transition and the financial institutions to divert its investment from fossil industries to renewable industries.
- Since there will be a presidential election, **no major regulatory changes** can be expected to take place next year. The regulators would likely want to keep the existing regulatory framework to maintain stability.
- **Low investments** in renewables will be expected in 2019. One of the main factors is the unsupportive regulations. Another factor is the decline in electricity consumption due to the slowing economic growth.
- Small scale renewables IPPs find **difficulties to obtain sponsors** for their projects. Unless there is support from the government in a form of government guarantee, the small scale projects will be hardly developed in the country.
- **Domestic biodiesel consumption will increase** to 6 billion liters according to MEMR Decree. The number could even be higher if the government decides to meet the B30 target in 2019. This will likely happen as the crude oil prices are projected to decline but still higher than 2017 prices.
- MEMR Reg No. 49/2018 is deemed to negatively affect the rooftop solar PV development. **Stagnant growth** is expected in residential and industrial rooftop solar PV due to unattractive clauses in the regulation. It is, however, not expected to hamper the commercial/public sector since most of the electricity produced by the solar PV will be directly consumed during the day.



Investment climate is unlikely to change, investors wait and see

- Indonesia will face the presidential election in 2019. We anticipate that the current government will make no significant changes in policy and regulatory instruments to accelerate renewables. The electricity tariff is a key factor that could drive renewable energy investments. As the electricity tariff issue is political in Indonesia, we expect the government to keep the electricity tariffs low next year. As a result, PLN will continue to push renewables investors to provide low-tariff renewables-based electricity in accordance to Regulation 50.
- There is some information on MEMR's intention to revise the Ministerial Regulation No. 50/2017. While the official announcement has not made yet, there is potential to raise some key issues such as tariffs, BOOT scheme, and procurement mechanism in this amendment process. However, stakeholders should keep expectations low as the revision of Regulation 50 would not immediately address all bankability issues as there are still issues with Reg. No. 10/2018. Unless this regulation is also revised, we expect to see no significant increase in investors confidence in the Indonesian renewables sector.
- Investors, notably foreign ones, are likely to wait and see until the new cabinet is formed in the last quarter of 2019. In this period of time, we expect to see more clarity on the new administration's priorities and direction in the energy sector.



Renewables development is likely slowing down, waiting for better policy and regulatory framework

- Geothermal exploration activities will be likely declining due to unfavored policy and regulatory framework stipulated in MEMR Regulation No. 48/2017 and No. 50/2017. Exploration and construction will be limited to existing fields. The survey and pre-exploration activities in fields owned by PLN and other six companies will also remain limited.
- Despite the huge potential of solar PV (on-grid and off-grid) to replace or reduce the use of diesel power plants, we expect to see limited new utility-scale solar projects in 2019 due to PLN's procurement process and the ability of grid to integrate more solar PV into the network. The technology costs, electricity generation cost (BPP), low cost financing, and procurement process are key factors that affect solar projects in Indonesia.
- The growth in rooftop solar PV will be modest and concentrated in Jabodetabek areas due to unfavored conditions stipulated in MEMR Regulation No. 49/2018 and the absence of financial support or incentives for households. There is however potential in rooftop development for industrial estate/areas where the electricity is not supplied by PLN.
- New utility scale wind projects are not expected to start in 2019, including the second unit of Sidrap wind farm. The slow development of wind power is due to policy and regulatory barriers, as well as the grid capacity and readiness of PLN's system to address intermittency challenges.



A way forward: short-term recommendations for renewables development in Indonesia

- Political leadership by President Jokowi to strengthen government commitment to jump-start and accelerate renewable energy development. The leadership is very critical to unite all government branches in setting up policy priorities, agendas, and orientation of SOEs. This could give positive signals to credible investors and financial institutions.
- Make significant revisions of MEMR Reg. No. 50/2017, MEMR Reg No. 10/2018, and MEMR Reg. No. 49/2018. Some issues that need to be addressed are renewables tariffs, BOOT, and risks allocation for PLN and project developers.
- Prepare/formulate additional incentive schemes for solar rooftop financing to complement MEMR Reg No. 49/2018. For example, soft loan with an interest rate of 7% (similar to small enterprise credit/KUR scheme) from the Ministry of Finance or credit facility for homeowners by banks. Government to increase the number and size of solar pv projects for government buildings and street lightings in a coordinated procurement to help open up solar market and maximize economies of scale benefits which will lower the technology costs in Indonesia.
- Government to provide capacity building for local banks/financial institutions through workshops, trainings, consultancy to improve their knowledge and capacity in risk assessment of renewable energy projects.
- Government to provide funding for small IPPs to produce quality FS. Another option, government can take over the FS phase and auction the result to IPPs.
- Prepare the legal framework for the establishment of Renewable Energy Fund and include it into the Renewable Energy Bill which the parliament is currently drafting.



NOTE

No reliable data on clean energy



There is a lot of inconsistent data published by the Ministry of Energy and Mineral Resources, either from different directorates or within the Directorate General of New and Renewable Energy. These unreliability and intransparency have caused difficulties in tracking and monitoring the development of renewable energy in Indonesia, makes it impossible to construct a proper policy in regards to clean energy and climate change mitigation. Following are our suggestions for data collection:

- ✓ Internal data auditors to ensure data consistency between documents.
- ✓ Provide updated and easily accessible data online, such interactive webpage.
- ✓ Better coordination between ministries and agencies in data collection



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