

# 2030 Indonesia Roadmap

**Multiplying the Transition:  
Market-based solutions for catalyzing clean  
energy investment in emerging economies**

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# About

BloombergNEF is working with the Climate Investment Funds to identify how financial intermediaries can mobilize clean energy investment in emerging markets. In the context of post-pandemic sustainable recoveries and the need to meet international climate commitments such as the Nationally Determined Contributions (NDCs), accelerating the global energy transition is now more pressing than ever. BNEF sees electrification through clean power and transport as the basis of decarbonization, and therefore, as the backbone of the energy transition. With investors' appetite for ESG products at an all-time high and capital needs for clean energy investment in many emerging markets often unmet, this project looks at how to better match this supply and demand. This slide deck serves to support the dialog with stakeholders on this topic.

## About Climate Investment Funds (CIF)

The Climate Investment Funds (CIF) is one of the world's largest and most ambitious climate finance mechanisms. Founded in 2008, it represents one of the first global efforts to invest in a dedicated climate finance vehicle. The CIF emerged from recognition by world leaders that climate change and development are inextricably intertwined. The CIF's creation also recognized a need to fill a gap in the international climate finance architecture—to deliver climate-smart investment at scale. The CIF supports developing and emerging economies in shifting to low carbon and climate resilient development.



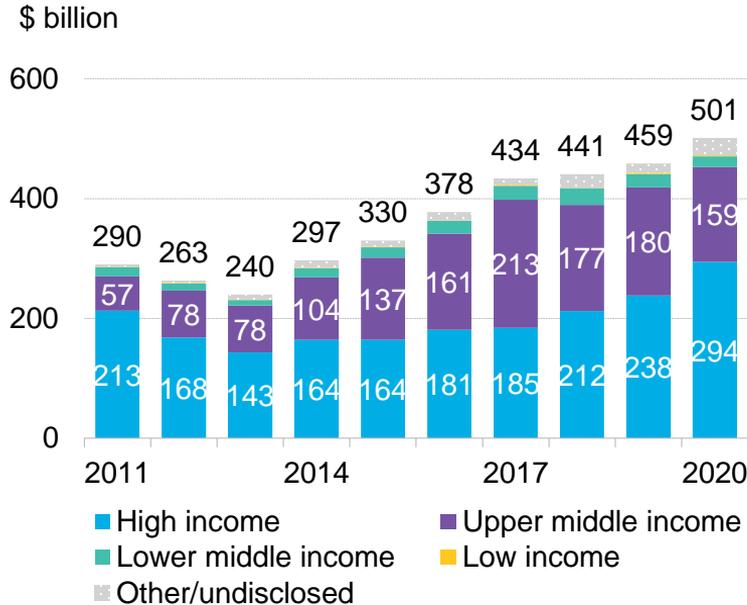
## About BloombergNEF (BNEF)

BloombergNEF (BNEF) is a strategic research provider covering global commodity markets and the disruptive technologies driving the transition to a low-carbon economy. Our expert coverage assesses pathways for the power, transport, industry, buildings and agriculture sectors to adapt to the energy transition. We help commodity trading, corporate strategy, finance and policy professionals navigate change and generate opportunities.

# BloombergNEF

# BNEF Take: Emerging markets and the energy transition

## Global energy transition investment



- Despite reaching a record-high in 2020, at \$501 billion, global energy transition investment has become even more concentrated in high income countries as a result of the Covid-19 pandemic. Emerging markets are, however, key to achieving the global energy transition, as they will produce the bulk of global emissions until 2050. In the context of delivering sustainable post-pandemic recoveries, accelerating economy-wide decarbonization is therefore more important than ever to keep global temperatures well below 2°C to deliver on the goals set under the Paris Agreement.
- BNEF sees electrification through clean power as the basis of decarbonization, and therefore, as the backbone of the energy transition. The power sector is a major contributor to overall emissions, with coal still the largest source of generation. Clean power generation technologies are the most readily available, scalable decarbonization solutions. To enable zero-carbon electrification of further sectors, renewable energy capacity needs to be expanded through utility-scale projects and distributed assets.
- At \$307 billion in 2020, investment volumes in renewable energy and storage are, however, far from the necessary levels to achieve this: BNEF estimates that expanding and decarbonizing the power system to stay on track for warming of as much as 1.75 degrees Celsius would require over \$2 trillion globally in power generation assets and batteries per year until 2050. There is therefore an urgent need to mobilize and accelerate clean power investment, particularly in emerging markets.

Source: BloombergNEF. Note: Numbers include renewable energy, electrified transport, electrified heat, energy storage, carbon capture and storage and hydrogen.

# Project overview

- **Focus: Scaling up clean energy investment through financial intermediaries in emerging markets**
  - Global energy transition investment and sustainable debt issuance reached a record high in 2020, but flows continue to be concentrated in the world’s wealthiest countries and a select group of trail-blazing emerging markets.
  - The 2020s are the decade where lessons learned need to be replicated and scaled across emerging markets to ensure that their economies can grow sustainably, and help meet the objectives of the Paris Agreement.
  - Through fund-deployment and fund-raising activities, financial intermediation has an important role to play in activating more players in the investment chain, mobilizing more capital and ensuring more liquidity for the energy transition.
- **The “Roadmaps”: Exploring country-level clean energy finance to 2030**
  - Focus: The short- to mid-term opportunities for intermediation in mobilizing clean energy investment in emerging markets in order to fulfil the commitments of the Paris Agreement.
  - Countries: India, Indonesia, South Africa, Morocco and Brazil.
- **Final report - structure:**
  - Part 1: “Looking back”: The evolution of financial intermediation in delivering clean energy investment.
  - Part 2: “Present situation”: Current opportunities and constraints to mobilizing investment through intermediaries.
  - Part 3: “Looking forward”: The further potential of leveraging intermediaries to accelerate clean energy investment.

# Indonesia: Key references and background reading

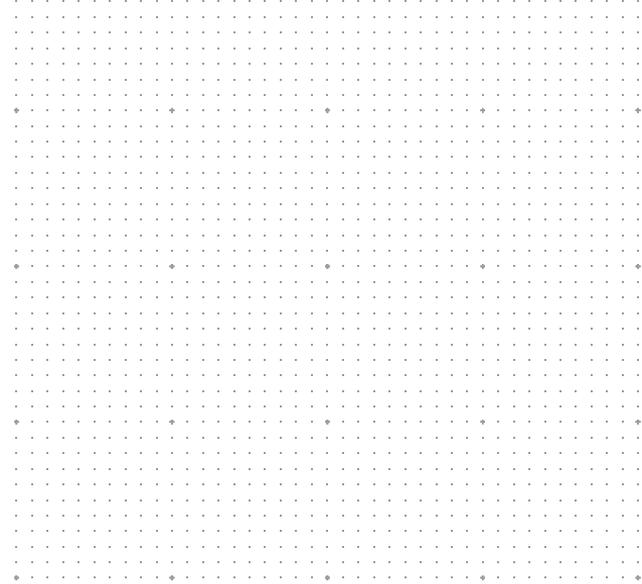
- Ministry of Energy and Mineral Resources (2021) [Strategic Plan 2020-2024](#)
- Ministry of Energy and Mineral Resources (2019) [Indonesian Electricity Supply Business Plan 2019-2028](#)
- Ministry of Energy and Mineral Resources (2014) [National Energy Policy](#)
- Ministry of Energy and Mineral Resources (2009) Electricity Law (No. 30/2009)

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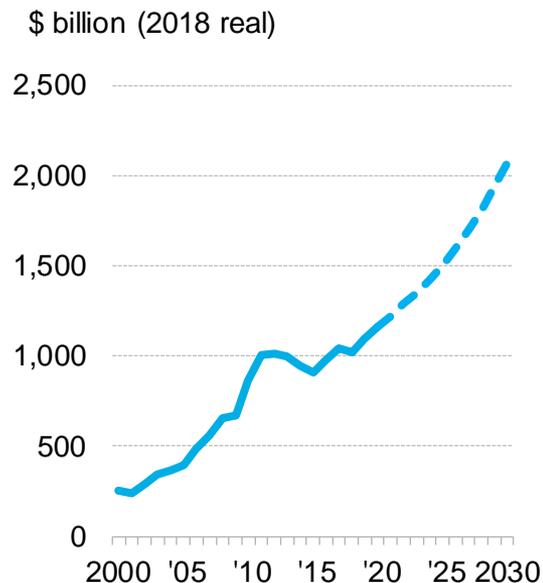
# State of the energy transition

Indonesia

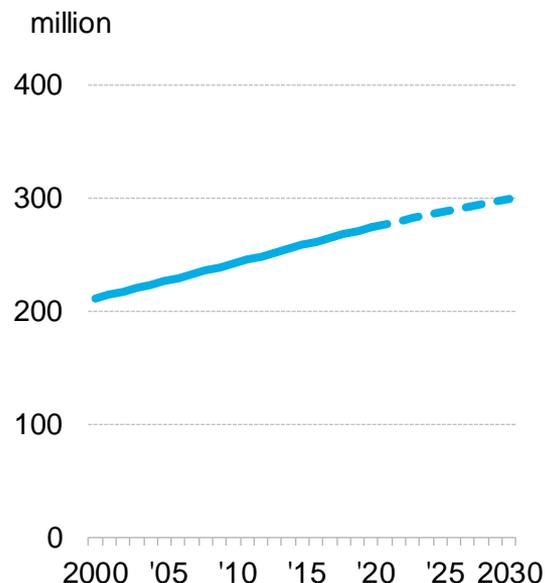


# Indonesia is poised for continued economic and demographic growth

## GDP



## Population



## Comments

- Sixteenth-largest GDP in 2020, but 11th largest GDP by 2030.
- Fourth-largest population in 2020, and remains so until 2030.
- Eighteenth-largest power consumer in 2020, 12th largest power consumer by 2030.

Source: BloombergNEF, IMF, OECD.

Source: World Bank.

Source: BNEF New Energy Outlook 2020.

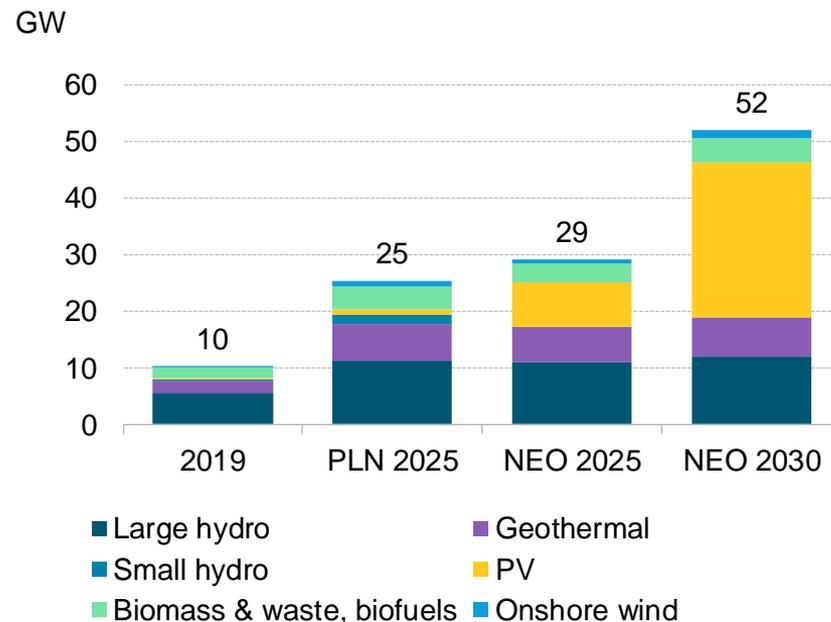
# Indonesia has modest renewables targets which feature fossil capacity

## Renewable energy targets

Entity	Target	Comments
PLN's 2019 National Electricity Supply Plan (RUPTL)	23% new and renewable capacity by 2025 (25GW renewables)	Of which oil <25%, coal >30% and gas >22%. Renewables focus mainly on large hydro, geothermal, biomass and biofuels.
Nationally Determined Contribution	See above	See above
BNEF Outlook	29GW of renewables by 2025 52GW by 2030	Least-cost outlook shows capacity higher than PLN, with particular emphasis on the potential of PV.

Source: PLN, BloombergNEF. Note: PLN refers to Perusahaan Listrik Negara, Indonesia's state-owned electricity company.

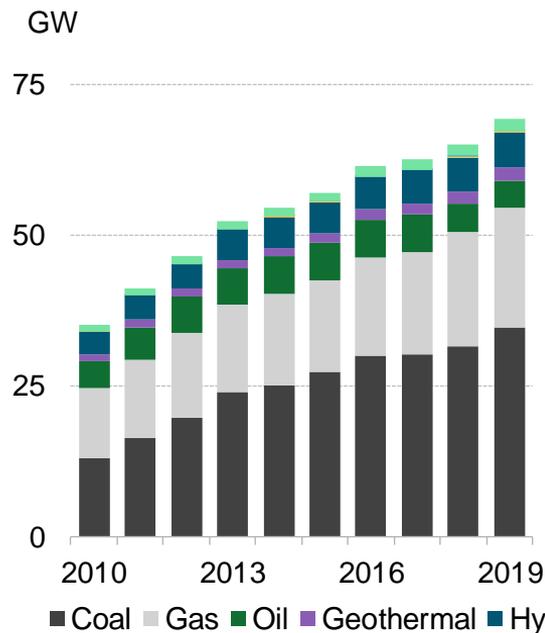
## Installed clean power capacity outlook



Source: PLN, BloombergNEF. Note: BNEF's NEO 2019 assumes least-cost outlook.

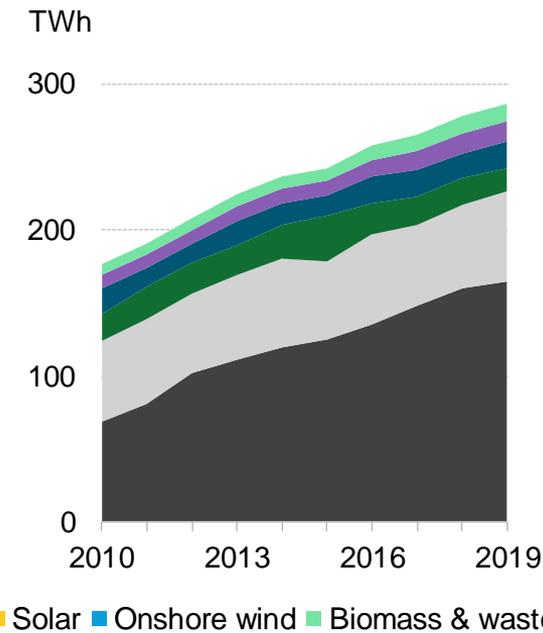
# Coal dominates Indonesia's power mix

## Installed capacity



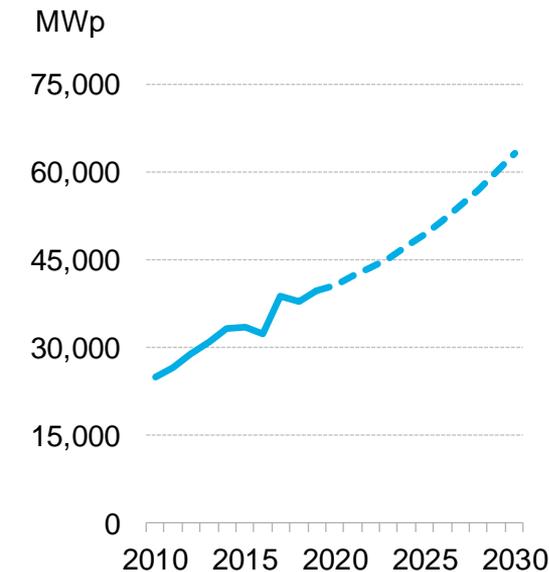
Source: BloombergNEF.

## Power generation mix



Source: BloombergNEF.

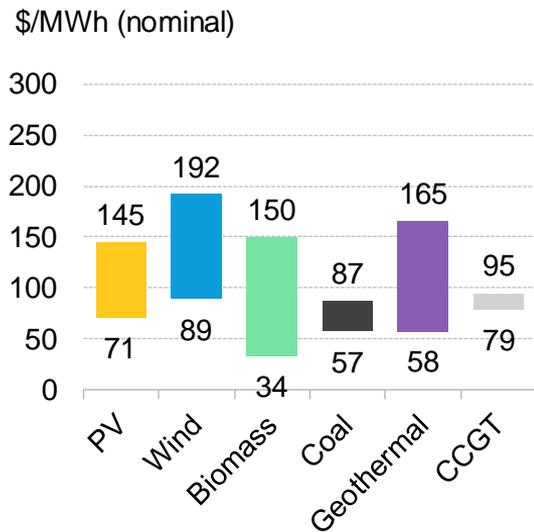
## Power demand trajectory



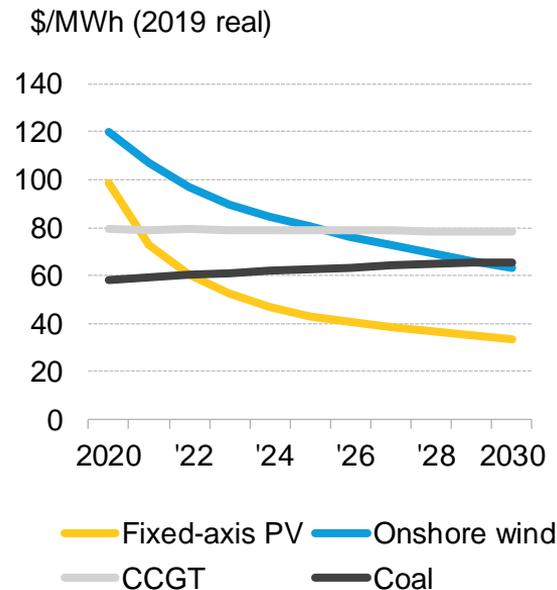
Source: BloombergNEF.

# ...and is set to remain in the mix for the foreseeable future

## Current LCOE (2H2020)



## Forecast mid-range LCOE



## Comments

- Coal is still cheap compared to renewables and will continue to be the cheapest fossil fuel available until past 2030. Economics alone will therefore not help to decommission coal assets.
- While solar PV is the renewable technology with the most potential in economic terms, its cost is high compared to other markets due to the lack of a local value chain and steady project pipeline as well as high financing costs. Plus, logistical challenges such as transporting equipment and a lack of expertise arise in remote areas.
- While PV will become increasingly competitive, the cheap cost of coal impacts project pipelines going forward, with wind only attractive as of the 2030s.

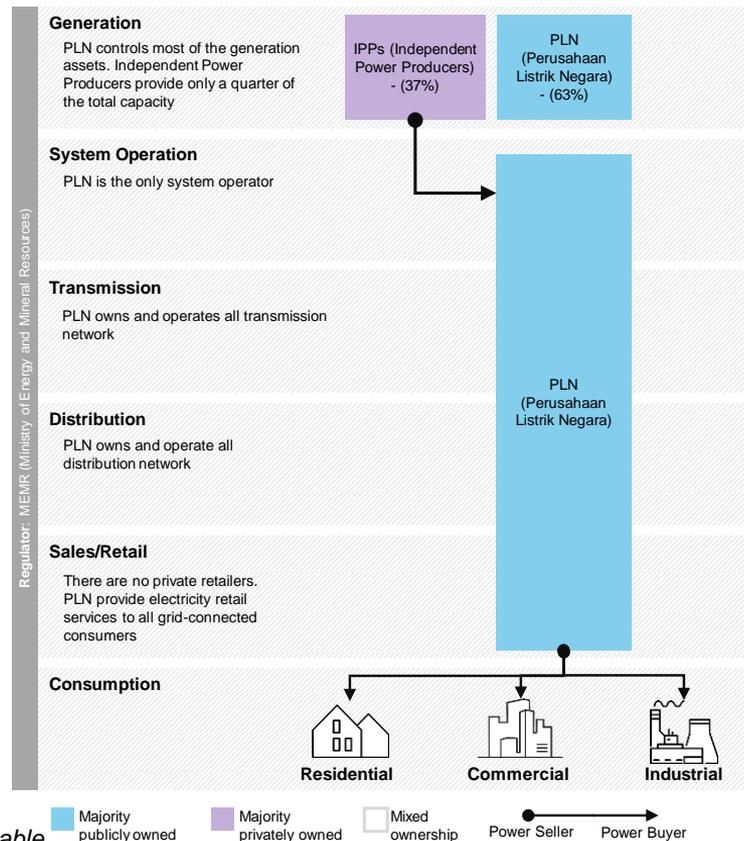
Source: BloombergNEF. Note: PV = fixed-axis PV.

Source: BloombergNEF.

# The Indonesian power sector is built around a state-owned monopoly

Power sector fundamentals	Status	Comments
Utility unbundling	●	Single buyer market
Private participation	●	Only generation is open through tenders
Bilateral contracts	●	On-site only
Off-grid generation	●	C&I, residential and minigrids
Purchase obligation	●	No standardized rules
Cost-reflective tariffs	●	Determined by Energy Ministry
Wholesale market	●	No wholesale market
Standardized PPAs	●	Signed in IDR (can be indexed to USD)

Source: BloombergNEF. Note: Green = available, yellow = somewhat available, red = not available.



# Current clean power incentives are very modest in ambition

Clean power policy	Status	Start date	Technologies	Impact to date	Details
Clean power target	● In force	2014	All renewables (excl. large hydro), plus nuclear, hydrogen, coal bed methane, gasified and liquified coal	Weak	Some 23% new and renewable power capacity by 2025 ( <i>RUPTL</i> 2019). The final version of <i>RUPTL</i> 2021 may include changes to this.
Feed-in tariff	● Planned	-	Solar, wind, small hydro	-	However, there is a renewable energy purchase price, which is pegged to the average regional and national generation cost ( <i>BPP</i> ), with a price cap.
Net metering	● In force	2013	Rooftop solar	Weak	Exported generation receives 65% of retail tariff. Reportedly unevenly enforced.
Accelerated depreciation	● In force	2015	All renewables	Encourages companies to set up renewable projects	-
Tax exemptions	● In force	2008	All renewables	Weak	Exemptions for power projects developed by or which have PPAs with PLN.
Priority grid access	● In force	2017	All renewables	Weak	Renewable energy plants have “must-run” status (formerly only plants ≤10MW, since 2020 no limit).

# Indonesia's clean power policies have driven little activity so far

## Looking back

- Overall, the clean power policies introduced or adjusted in the past decade have had little success in incentivizing clean power investment.
- The impact of Indonesia's renewable energy purchase price is somewhat limited. The purchase price is pegged to the regional and national average generation cost (*BPP*) and includes a price cap.
- Since 2013, there is a net metering scheme for rooftop solar, which was updated in 2018. It only covers 65% of the retail price and is notably poorly enforced.
- Indonesia introduced a priority grid access policy for renewables plants  $\leq 10$ MW in 2017. Due to the low project threshold, the policy has had little impact on incentivizing new-build so far. However, this may change in the future, as the threshold cap was lifted in 2020.

## Looking forward

- Recent changes in Presidential Regulation 10/2021 may ease market access through relaxed foreign ownership rules, with 100% ownership now possible for plants above 1MW. Successful projects will likely still be joint ventures including local partners.
- A first draft of the *RUPTL 2021* indicates a larger focus on solar PV. Depending on the final document, this may offer up further investment opportunities.
- Much of renewables investment and project development is on hold, awaiting the pending Presidential Regulation on renewable energy toward late 2021.
  - The regulation is likely to include the introduction of a feed-in tariff for smaller renewables plants.
  - While further favorable regulatory changes surrounding renewables are expected, the overall level of energy transition ambition remains uncertain.

# ...with many regulatory bottlenecks hampering the market

## Key bottlenecks

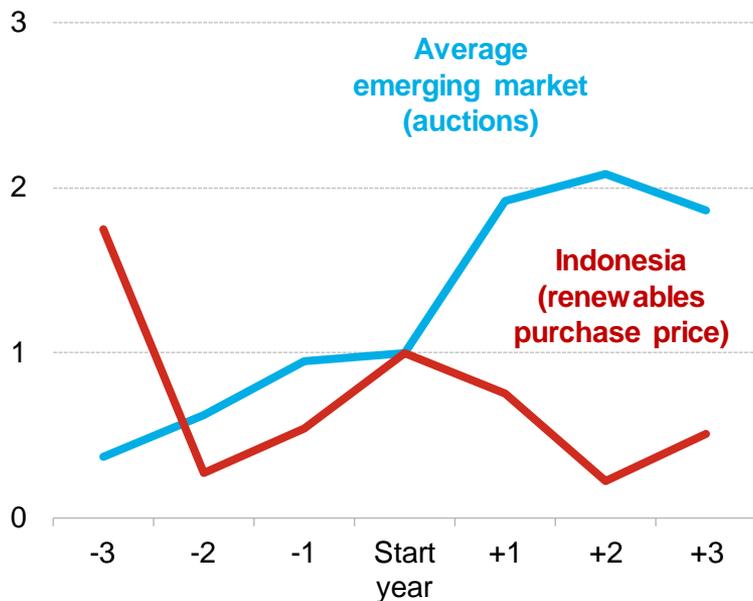
- The major bottleneck of the Indonesian power sector is the lack of a clear procurement pipeline and current thermal overcapacity under PLN's highly regulated single buyer market structure. A weak incentivizing framework for clean power further hampers the development of the renewables market. While generation is open to IPPs, tenders are limited, with invitations to pre-qualify only issued periodically. The tender processes can also lack transparency, with the results often not published.
- Licensing and permitting procedures for new projects tend to be lengthy.
- Renewables must directly compete with subsidized coal under the BPP.
- Foreign ownership is not allowed for plants <1MW, as these are reserved for cooperatives and SMEs.

### **BNEF Take: Power market (over-)regulation**

The lack of a clear project pipeline communicated by the government and the current oversupply of fossil capacity in key load areas is hindering the build-out of renewables projects. Together with occasionally poor regulatory enforcement and a general high risk perception of the market, this makes the Indonesian power market difficult to access. A clear political commitment to decarbonization, in addition to a transparent project pipeline and attractive clean power incentives would help to create investment opportunities.

# Existing policies have done little to spur renewables new-build

## Policy introductions and investment growth



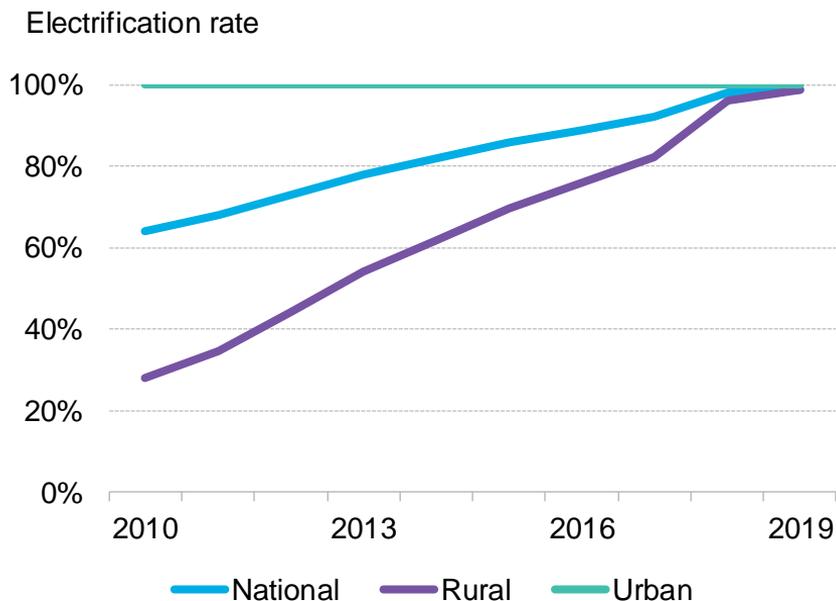
## Comments

- The Indonesian Energy Ministry procures new capacity through tenders. More powerful clean power incentives, such as auctions, are not on the horizon. The most powerful policy tool so far is a renewables purchase price for projects, introduced in 2017.
- The policy pegs the purchasing price of renewable power to the regional and national average (*BPP*), capping it at a certain price ceiling.
- The introduction of the purchasing price has done little to spur renewables investment in past years, with overall volumes remaining patchy. This stands in contrast to examples seen in other emerging markets which implemented well-designed auctions. Following the introduction of auctions, the energy transition investment in an average emerging market tends to increase, until competition helps to lower costs.

Source: BloombergNEF, CFLI. Note: Baselined growth to 100. "Average" includes 31 emerging markets that introduced auctions between 2012 and 2018.

# Full access to steady electricity supply remains a challenge in remote areas

## Access to electricity in Indonesia



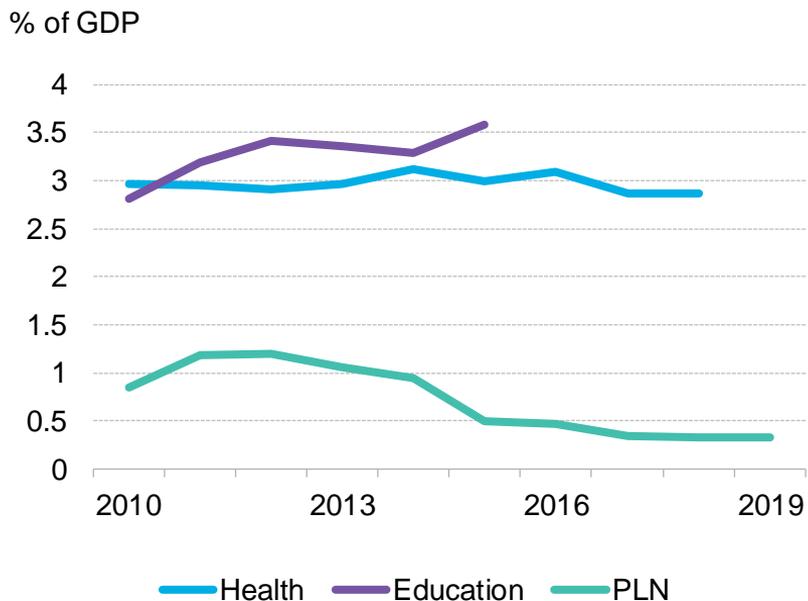
Source: BloombergNEF.

## Comments

- Being an archipelago, Indonesia faces high geographical constraints in rolling out a national grid and secure, affordable supply. Remote areas in Eastern Indonesia are yet to achieve complete electrification despite strong progress, with reliability of power supply a further issue.
- Diesel generators are the most commonly used solution, yet involve high fuel costs and pollution.
- Off-grid solutions such as mini-grids or the hybridization of diesel generators with solar modules offer potential to advance electrification and supply-reliability goals.
- Given regulatory constraints under PLN's monopoly, the mini-grid market has proved challenging to private sector developers. The development of mini-grids has therefore mainly been led by DFIs, with local governments, co-operatives, village-owned enterprises and communities responsible for their operation upon completion.

# Spotlight: Supporting PLN is expensive for the Indonesian government

## Government expenditure as % of GDP



Source: Statista, World Bank.

## Comments

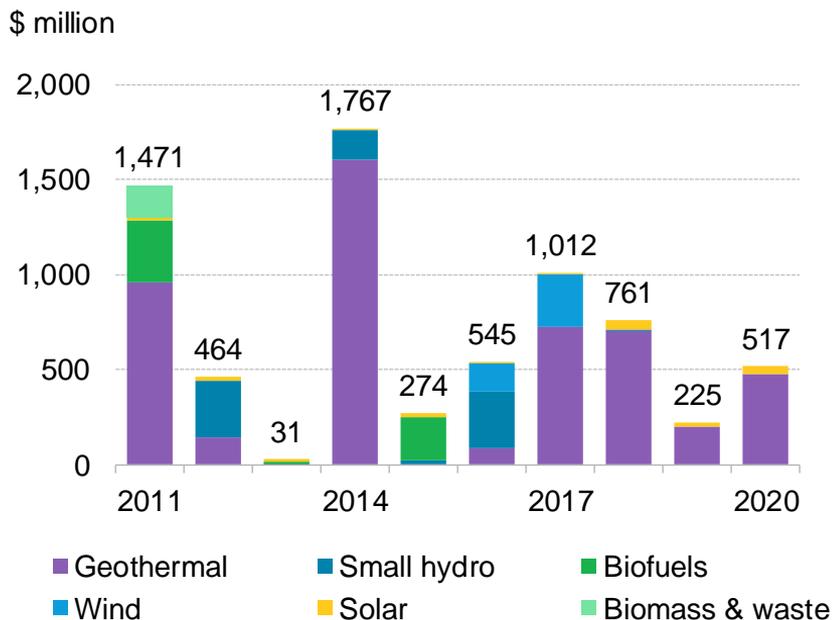
- Electricity subsidies for state utility PLN have accounted for as much as 1% of Indonesian GDP expenditure in the past, but have decreased in recent years.
- PLN's financial situation is shaky, with government funds and debt issuance needed to recapitalize it frequently.
- Exchange-rate volatility has negatively impacted PLN's finances, as PPAs indexed to the U.S. dollar have caused soaring costs, for instance during the Covid-19 global pandemic.

### **BNEF Take: Private sector participation**

Allowing more private participation in the generation segment through a competitive procurement pipeline as well as economic dispatch and cost-reflective tariff setting would make the Indonesian power sector more efficient and reduce government liabilities.

# Renewables investment is patchy and dependent on singular deals

## Renewable energy investment



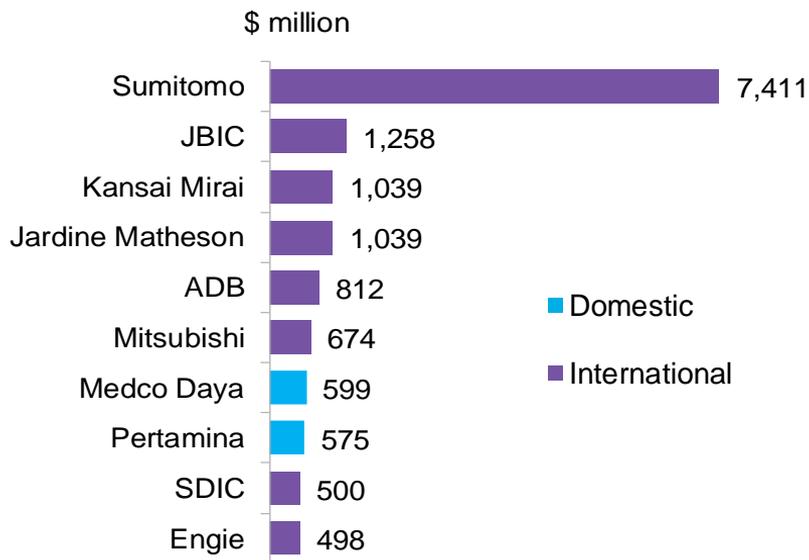
Source: BloombergNEF.

## Characteristics

- Indonesia is not able to secure a steady pipeline of renewables investment, experiencing large annual fluctuations dependent on singular deals.
- Much of the investment from IPPs also involves companies majority-owned by state utility PLN.
- The vast majority of renewables investment in the past decade has targeted geothermal, at \$4.9 billion between 2011 and 2020. This amounts to 70% of the decade's total.
- Geothermal has been one of the key priorities for the government and the technology for which most familiarity exists in the market, yet interest in solar PV has recently been increasing. Due to high resources, further geothermal projects offer potential for baseload generation, but by nature tend to involve greater complexity than other utility-scale renewables in terms of deal size, number of financing entities and development lead times. This has led to limited progress on planned projects so far.

# Large international investors are active in geothermal deals

## Key renewables financial players, 2011-2020



Source: BloombergNEF. Note: JBIC = Japan Bank for International Cooperation, ADB = Asian Development Bank, SDIC = State Development & Investment Corporation. Only includes disclosed activity.

## Renewables investor characteristics

- The major financial players involved in renewables investment in the past decade are Asian banks, and in particular Japanese ones.
- There is currently a lack of a deep local market for renewables investors. While liquidity is theoretically available, investors do not have an appetite for renewables projects, hampered by the current regulatory framework and lack of meaningful policy incentives.
- In terms of foreign investment, the largest investors to date have been commercial banks and utilities. Involvement tends to be attached to large, singular deals, which are often supported by DFIs.
- Successes in attracting foreign investment for geothermal through DFI support can provide lessons for establishing other technologies in the market.

# Summary: Indonesia's energy transition is suffering from a lack of enabling environment

## Opportunities

### Potential for rural electrification and archipelago supply

Around 1% of the Indonesian population has yet to obtain access, and reliability of supply is often still lacking. Given the geographical make-up of the country, diesel gensets are still a widespread means of power generation. Both the hybridization of diesel plants and the archipelago nature of Indonesia offer potential for decentralized power.

### Positive economic trajectory and ensuing power demand

Indonesia is a fast-growing economy, with the growth in population and urbanization increasing power demand. Yet, while the economy is growing, there is currently an oversupply of installed capacity, particularly in load areas, so growth will do little to incentivize renewables new-build alone.

### First examples of utility-scale renewables

The market is seeing its first examples of utility-scale renewables from IPPs such as Vena or AC Energy. While these were supported by a now-canceled feed-in tariff, further opportunities such as floating solar are also being explored by international developers such as Masdar, which announced a 145MW plant in late 2020. It seems likely the Energy Ministry will provide support for the establishment of solar parks, facilitating current issues such as land acquisition or grid access.

### First examples of C&I onsite generation

Large international corporations have been key drivers in the Indonesian C&I market. Companies such as Nike, Danone or Coca-Cola are piloting renewables-based self-generation projects, which can serve as templates for further such projects.

## Challenges

### Single buyer market lacking project pipeline

A key barrier in the Indonesian power market is the current overcapacity and lack of project pipeline of PLN, with IPPs depending on PLN to sign PPAs. Plus, intransparent processes for the limited tenders which are floated do little to incentivize market entrance.

### No clear policy support for major renewables technologies

Until recently, there was little support for established renewables technologies such as PV and onshore wind, with policy instability regarding the introduction and subsequent removal of a feed-in tariff. The government considers fossil fuels in its energy transition targets and prioritizes cheap, domestic coal. Despite low utilization rates, PPAs with thermal plants include a fixed capacity payment, which supports their economic viability.

### Intransparent regulatory environment for new projects

Much of the Indonesian power market is highly regulated, yet regulations can also be intransparent and poorly enforced. Permitting and licensing procedures for new projects can be slow. Moreover, the lack of a sufficient local supply chain makes complying with stringent local content rules arduous.

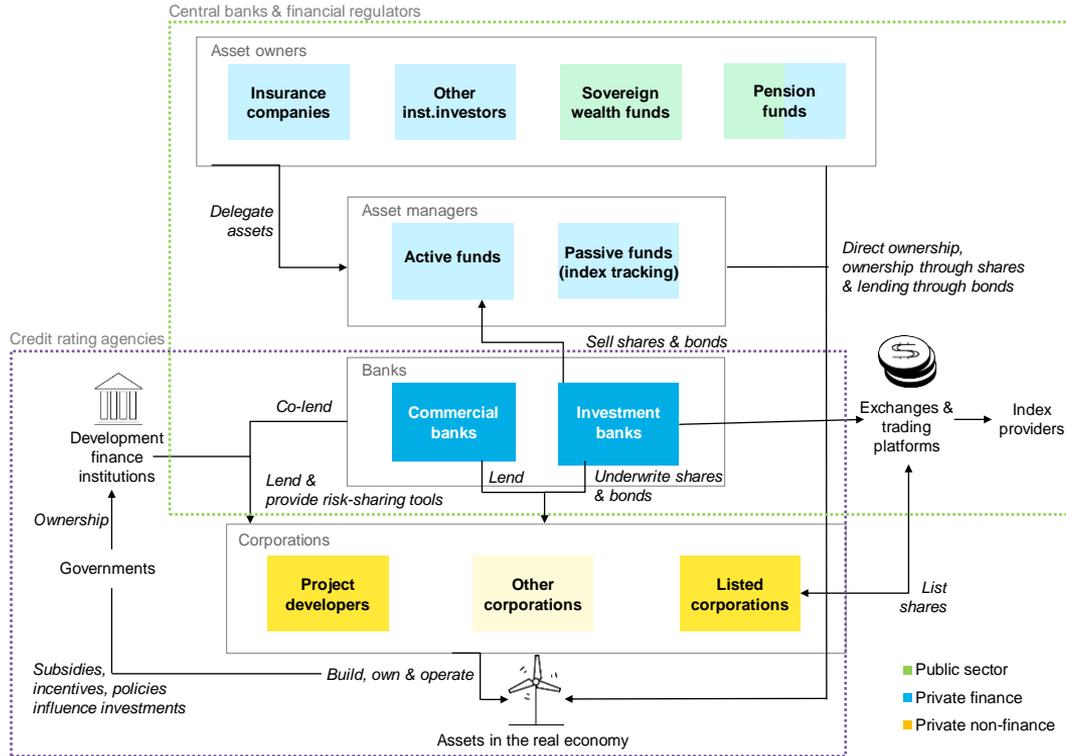
### Non-cost reflective power tariffs

Indonesian power prices are highly subsidized and set by the Energy Ministry. Tariffs well below cost recoup do not incentivize the build-out of self-generation facilities.

# Financial ecosystem, capacity and financing needs

Indonesia

# Much of the investment chain in Indonesia remains to be activated



**Note:** Faded color indicates weak representation, with bold color showing strong representation.

Source: CFLI, BloombergNEF.

# Active players are mainly international banks

## Investment chain representation

Entities	National	International
Asset owners	● Not active	● Not active
Asset managers	● Not active	● Not active
Banks	● Semi-active	● Active
Corporations	● Semi-active	● Active

- The Indonesian financial sector is fairly shallow, in particular with regard to clean power investment.
- The major active entities domestically so far are banks such as Bank Negara Indonesia or corporations such as Medco Daya or Pertamina.
- High currency risk in the Indonesian rupiah has led foreign renewables investors to source capital outside the country so far.

### **BNEF Take: Intermediation in focus**

There are multiple reasons for the lack of local appetite in clean power financing across the investment chain, such as limited options to market entry, tight regulatory environment and a perception of high risk surrounding renewables projects. While liquidity is therefore available, the reach of the only available DFI Sarana Multi Infrastruktur (PT SMI) is not strong enough to crowd-in investment.

Source: BloombergNEF.

# Key intermediation deals to date have targeted geothermal

## Examples of financial intermediation in clean power projects in Indonesia

Entity	Sarulla Operations Ltd.	Star Energy
Set-up	International consortium: Medco Power Indonesia, Itochu, Ormat and Kyushu EPC.	Domestic project developer
Aim	Development of 330MW geothermal plant	(Re-)financing of development, construction and operation of geothermal plants in Java.
Intermediation	Fund-deployment	Fund-raising
Instruments	<p>Equity stakes: project consortium</p> <p>Senior loans: Asian Development Bank, Japan Bank for International Cooperation (JBIC) and six commercial banks</p> <p>Concessional mezzanine loan: Clean Technology Fund, Canadian Climate Fund</p> <p>Guarantee: JBIC (20-year government offtake guarantee and political risk guarantee for commercial banks)</p>	<p>Green bond: Issuance of a \$1.1 million senior secured green bond, which adheres to ICMA and ASEAN Green Bond Standards.</p>
Outcome	This project shows the highest private sector involvement for a new geothermal project in the Indonesian market to date.	The bond was 3.5 times oversubscribed, in addition to being the first investment-grade green bond to enter the market.

# The Indonesian financial market is fairly shallow, especially for renewables

## Financial sector maturity

Indicator	Value
Domestic credit from financial sector	46.5% of GDP
Domestic credit to private sector by banks	32.5% of GDP
Lending interest rate	10.4%
Stocks traded, total value	10.5% of GDP
Turnover ratio of domestic shares	22.5%
Depth of credit information index (0=low, 8=high)	8
Strength of legal rights index (0=weak, 12=strong)	6

Source: World Bank. Note: 2019 data.

## Key characteristics

### Debt:

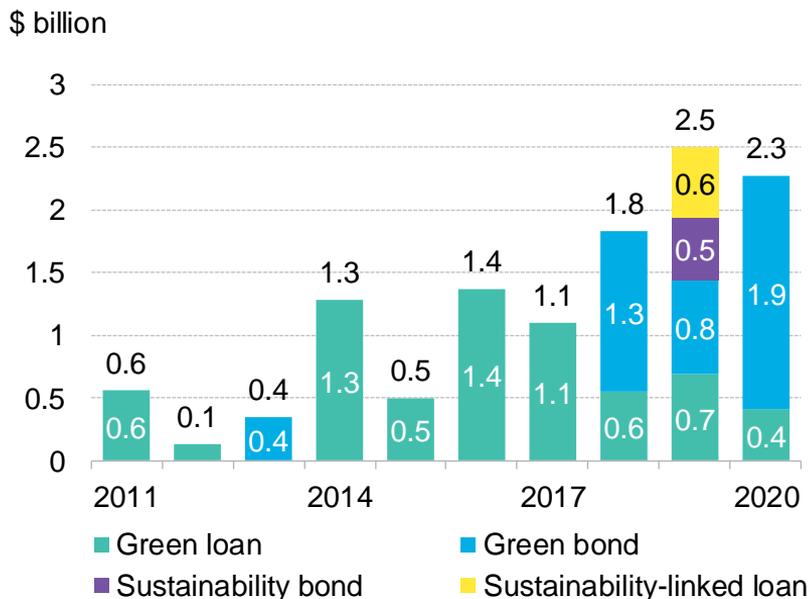
- The main debt instruments available in the Indonesian market are loans. However, these are not tailored to renewable project needs and are characterized by high interest rates and short tenors. Long-term debt or non-recourse loans are only available for projects with credible regional or international sponsors.
- While in its early stages, there is activity in bond markets for larger IPPs, such as Star Energy.

### Equity:

- There is a relative lack of different domestic entities offering equity, with low appetite for renewables projects.

# Driven by green bonds, sustainable finance activity is on the rise

## Sustainable debt issuance



Source: BloombergNEF. Note: Data includes all sub-industries.

## Comments

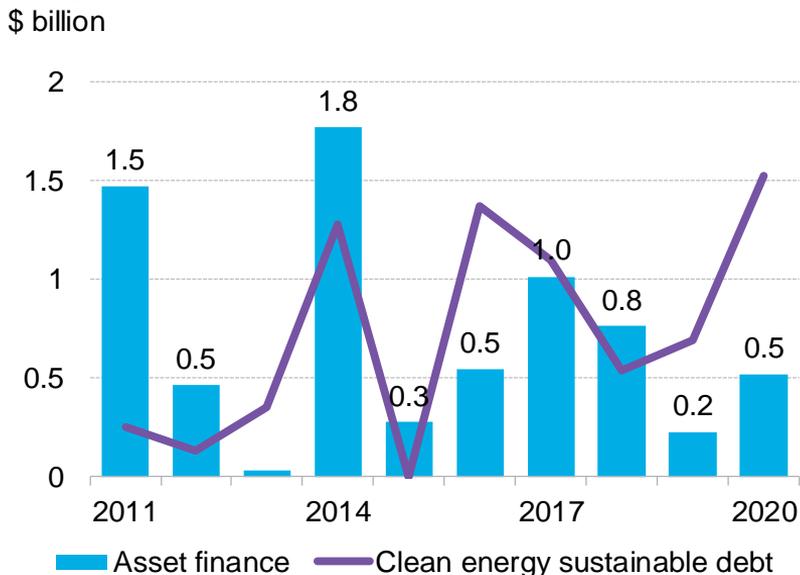
- Indonesia is one of the most progressive emerging markets in terms of sustainable finance regulation. The Financial Services Authority OJK is a member of the Sustainable Banking Network.
- Key policies on sustainable finance include:
  - Roadmap for Sustainable Finance in Indonesia 2015-2019
  - Regulation Number 60/POJK.04/2017 on the Issuance and the Terms of Green Bond
  - PLN Statement of Intent on Sustainable Financing Framework
  - Regulation Application of Sustainable Finance to Financial Services Institution, Issuer, Publicly Listed Companies

### BNEF Take: Green bonds

Green bonds are attractive instruments for IPPs to meet their debt needs, particularly if local lending conditions do not match renewables project development conditions. Exploring green bonds can also prove interesting to international institutional investors seeking to fulfil ESG mandates.

# Sustainable finance offers refinancing opportunities going forward

## Clean energy sustainable debt volume compared to asset finance



## Comments

- Similar to the trend seen in asset finance for new renewables projects, sustainable debt issuance in the power industry in Indonesia is volatile.
- However, power-related sustainable debt issuance has exceeded asset finance levels on multiple occasions. The proceeds are used to (re-)finance projects.
- Sustainable debt is overwhelmingly issued by corporates. Between 2011 and 2020, they issued \$6.9 billion, whereas projects only accounted for \$0.4 billion.
- The vast majority of instruments is denominated in U.S. dollars, at \$7.2 billion, with only a fraction in rupiah (\$0.04 billion).

Source: BloombergNEF. Note: Sustainable debt here only includes issuances from the power industry (utilities, renewable energy and power generation).

# Capex declines and falling cost of debt and equity benefits PV

## LCOE assumptions

	2020				2030			
	PV	Wind	Coal	Gas	PV	Wind	Coal	Gas
Capex (\$m/MW)	1.05	1.84	1.53	0.87	0.4	1.65	1.49	0.85
Debt ratio	70%	70%	75%	75%	70%	70%	55%	67%
Cost of debt (bps)	1050	1050	650	850	747	747	755	822
Cost of equity	12%	12%	10%	10%	9.3%	9.3%	13.6%	10.7%

## Comment

- Financing conditions are currently most favorable to coal and gas, which reflects the market's reluctance to finance new renewables projects.
- However, steep Capex declines for PV, in addition to a more favorable cost of debt and equity, will help it overtake coal and gas by 2030.
- Despite improved financing conditions, capex for wind remains high until 2030.
- On an LCOE basis, PV is the best-suited technology to add or replace power-generating capacity in the next 10 years.

Source: BloombergNEF. Note: Green = improvement, yellow = stable, red = deterioration. PV = fixed-axis PV, wind = onshore wind, gas = CCGT.

# Summary: Future clean power investment depends on mitigation of market risks

## Opportunities

### Replacement of fossil assets with renewables capacity

Given Indonesia's large installed coal capacity, clean power investment can focus on successively greening and replacing the fleet.

### Leverage advanced sustainable finance regulation

Indonesia's regulation on sustainable finance is advanced, with growing familiarity of the market with bonds. Amongst others, state utility PLN can make use of this, as its rating is comparable to that of the Indonesian government.

### Relaxed foreign ownership rules

While likely small in impact, changes to foreign investment restrictions in early 2021 will help to facilitate the possibility of international investors entering the market. Formerly limited to a maximum of 49%, power plants above 1MW can now be up to 100% foreign-owned.

### Use lessons from geothermal investment

Lessons from previous geothermal investment regarding co-investment structures and policy incentives can prove a template for de-risking other renewables technologies. The (non-)fiscal incentives from early 2021 will help.

## Challenges

### Shallow financial sector

The Indonesian financial sector is relatively shallow, in particular regarding familiarity of financing renewables. Few domestic financing entities and instruments exist, which are further hampered by regulatory bottlenecks. There is a lack of Indonesian rupiah liquidity for renewables projects, with PPAs with IPPs signed in U.S. dollars, incurring PLN significant hedging risk.

### Financial viability of coal

Financing conditions for new power plants currently favor coal and gas, with coal remaining cost-competitive in the next 10 years. In combination with the government's prioritization of coal, this will make it harder for renewables.

### High risk perception

Both domestically and abroad, there is high perceived investor risk for Indonesia. Issues such as regulatory changes, offtaker and currency risk as well as issues surrounding land acquisition, project execution and grid availability impact investors' willingness to enter the market. Moreover, many are first awaiting the Presidential Act on Renewable Energy, due to be released later in 2021.

### Lack of financing options for small-scale assets in particular

While accessing finance for utility-scale assets is not without challenges, the financing options small-scale projects can access are even scarcer.

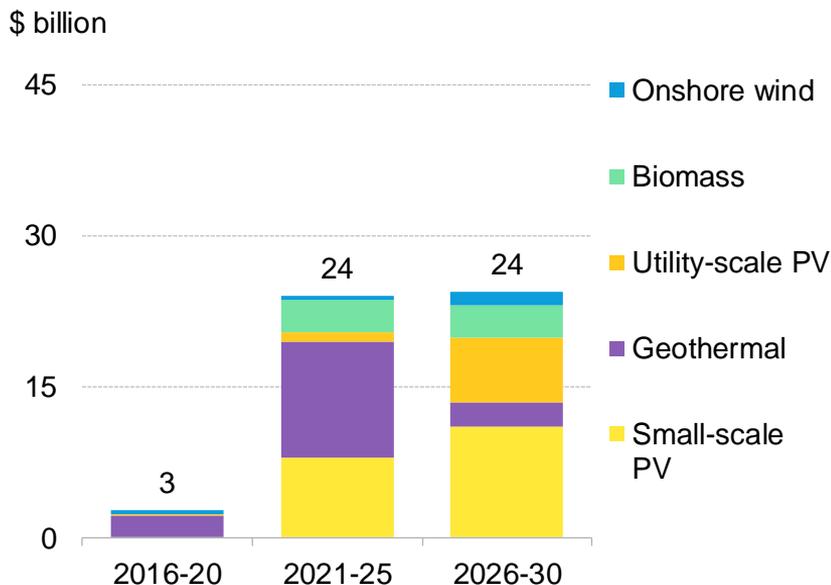
# Leveraging intermediaries to accelerate clean power investment

Indonesia

# PV provides the largest economical investment opportunity to 2030

## Least-cost investment pipeline, 2020-2030

## Investment outlook to 2030

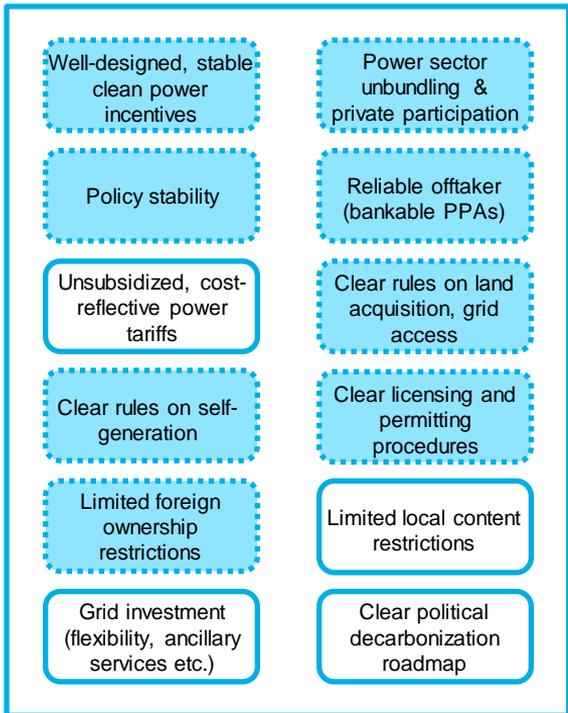


- Under the *RUPTL* 2019, the Indonesian government assumes large hydro and geothermal additions will meet its 2025 target, yet progress on projects has been limited. In the current draft *RUPTL* 2021, PV gains a more prominent position at the expense of geothermal. BNEF's New Energy Outlook sees a large role for small-scale PV, in particular in the next 10 years.
- The technology with the most least-cost potential in terms of investment volume and capacity added is PV. The outlook for small-scale PV amounts to \$19 billion in the next decade, with \$7.2 billion for utility-scale PV.
- Based on the existing project pipeline, the outlook sums geothermal at \$14 billion.
- There is a limited role for onshore wind at \$1.7 billion.
- Given the least-cost outlook and current lack of procurement pipeline, this might suggest supporting small-scale decentralized energy within regulatory means as well as assisting in PLN in 'greening' its assets.

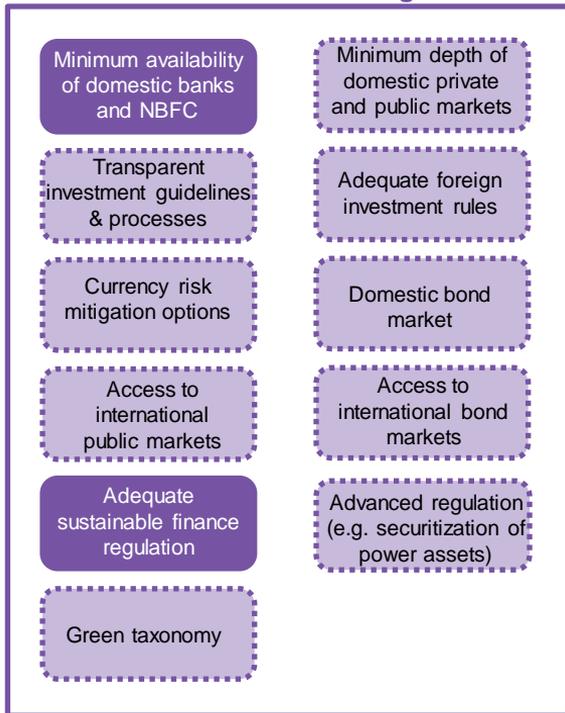
Source: BloombergNEF. Note: Theoretical pipeline assumes least-cost technological potential. Includes select renewables technologies only.

# Indonesia currently lacks the enforcement of necessary market fundamentals

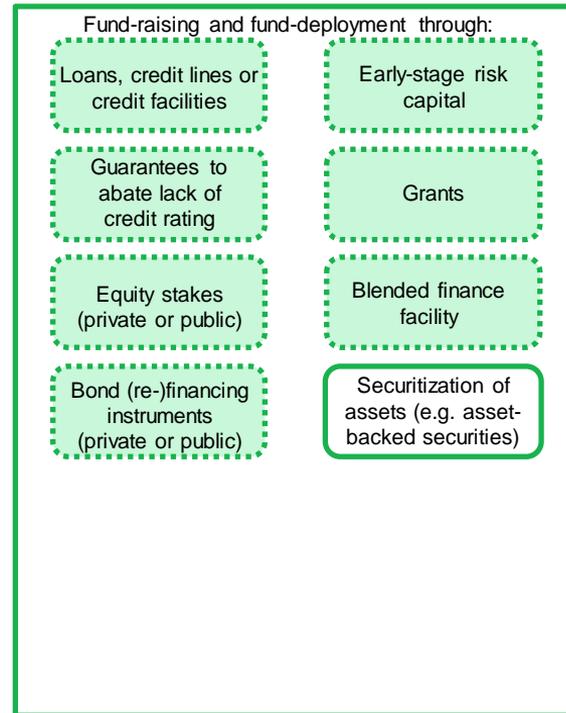
## Power sector



## Financial sector and regulation



## Financial intermediation



Source: CFLI, BloombergNEF.

Note: Full color = availability; dotted lines = partial availability; blank = remaining opportunity.

# Indonesia's enabling environment requires improvement to properly leverage intermediaries

- Through its highly regulated, but at times poorly enforced processes, Indonesia is lacking many of the necessary market fundamentals in order to attract clean power investment. The clean power policies introduced in the past decade have done little to incentivize renewables.
- In the power sector, the lack of a clear project pipeline and current thermal overcapacity greatly impact the vitality of the market. Moreover, many existing regulations or incentives are not fully enforced, causing investor uncertainty. Overall, there is a need for the Indonesian government and/or PLN to provide a clear direction and incentives in order to accelerate utility-scale renewables build.
  - **Acceleration opportunity:** There is a need to translate success with geothermal investment to other utility-scale technologies, including through enhancing clean power incentives and simplifying project development procedures. This must also be adapted to providing adequate incentives to small-scale projects and facilitating corporate offtake.
- In the financial sector, the lack of domestic and, to a certain extent, international involvement can largely be attributed to the lack of procurement pipeline, high risk perception, regulatory bottlenecks and uncertainty.
  - **Acceleration opportunity:** clear regulations in terms of renewables support will help to activate more entities of the investment chain, with short-term opportunities presenting themselves in the form of tapping bond markets.

# Action area 1: Addressing the lack of project pipeline and overcapacity

The success of Indonesia's energy transition depends on opening up a clear project pipeline and addressing the current issue of capacity oversupply by successively greening or replacing uneconomic and/or low efficiency coal plants.

## Investment opportunities

- Once a clear project pipeline is in place, domestic and international financial intermediaries can help PLN, its subsidiaries and IPPs to deploy and raise the necessary funds to install new utility-scale renewables capacity. To accommodate the increasing share of intermittent renewables on the grid, investment into transmission and distribution will also be needed.
- Investment opportunities include:
  - PLN can make use of its good access to the bond market to raise transition or green bonds to finance new clean capacity and loans or pooled debt funds for investment into transmission and distribution. Together with concessional support, solar PV with storage in particular can provide a clean solution to greening the fleet.
  - Using securitization to pool uneconomic or undepreciated coal assets off PLN's balance sheet and free up capital for new investment in clean replacement resources (see Slide 38). This can also provide a means of incurring revenue to support impacted mining communities.

## Enabling environment opportunities

- Capacity building can help to draw up a clear procurement pipeline to allow IPPs to enter the market. PLN could, for instance, open tenders that allocate capacity based on power systems needs and prioritize least-cost renewables and storage. In addition, supporting regulatory changes to put in place stable and attractive clean power incentives and simplifying project development procedures will help decrease investor uncertainty. This will include revisiting provisions on self-generation and decentralized energy as well as power tariff regulation.
- Due to the low cost of coal, DFI support to further lower the cost of renewables and storage can prove an incentive for PLN to replace thermal with renewables capacity. However, due to the inextricable socioeconomic links to the mining sector, lowering the cost alone will not move the market.
- Support in enabling the securitization of coal assets could provide fresh capital off-balance sheet to help pay down existing debt (see Slide 38).

## Action area 2: Scaling up and greening decentralized energy in rural areas

Due to Indonesia's geography, decentralized energy offers a key investment opportunity to increase power access and reliability and decrease dependence on diesel gensets. Technical assistance is needed to adjust provisions on derogating power to remote areas in particular.

### Investment opportunities

- There is a role for domestic intermediaries to deploy funds to PLN, its subsidiaries and, in areas where PLN's reach is limited, entities such as municipally-owned enterprises (BUMD) for new decentralized and diesel-PV hybridization projects.
- Loans, credit lines or other forms of financing can help to grow the small-scale PV and storage as well as genset hybridization market. Especially for entities other than PLN, this will likely require DFI support. In particular, DFI funding can prove valuable to lower the further "prove" and lower the cost of storage.
- Once the market has gained more familiarity, aggregating small-scale projects to access further investors can be of interest.

### Enabling environment opportunities

- Technical assistance is needed to implement the regulatory changes to allow for derogation from PLN in remote areas and more actively involve entities such as BUMD in power generation. Clear regulations surrounding offtake and greater enforcement of net metering will provide investors with more clarity.
- Supporting the capacity building of the small-scale market and offering suitable financing mechanisms will help to familiarize lenders with the technology and grow the market.
- Enabling the regulatory changes and supporting e.g. BUMD in the securitization of projects with a similar profile could help access a wider range of investors.

## Action area 3: Scaling up the self-generation market

In addition to greening the utility-scale fleet, efforts need to be made to spread the renewables market in breadth too. Installing self-generation facilities can improve power reliability for large industrials and commercials. There is a need to develop suitable financing mechanisms for smaller commercial users, which are currently underserved.

### Investment opportunities

- Financial intermediation has a role to play in offering suitable financing mechanisms to C&I entities where the regulatory environment allows.
- While international C&I will likely continue to rely on international capital, DFIs can support domestic banks and NBFC in deploying funds to small-scale PV and storage projects of SMEs.
- Once these more traditional instruments have been proven on the market, securitization of projects with a similar profile can be considered as a next step to access further investors.

### Enabling environment opportunities

- While large international corporations have piloted this model, financial access for local C&I might require DFI support, particularly for SMEs. DFI support can help to cultivate market familiarity and the development of self-generation projects coupled with storage through loans, credit lines or other forms of financing facilities. At a later stage, it can be useful to explore and support the securitization of assets for projects with a similar profile.
- DFI funds could be particularly helpful to “prove” and bring down the cost of small-scale storage.

# Action area 4: Activating the domestic financial sector

In light of the constrained renewables investment environment in Indonesia due to the lack of project pipeline, thermal overcapacity and regulatory environment, many local financial players are not sufficiently familiar with renewables financing, with many IPP projects to date financed in overseas currency.

## Investment opportunities

- In order to better activate domestic intermediaries and familiarize them with fund-deployment to renewables, DFIs could support Indonesia's national development bank PT SMI (or an entity) in providing de-risking mechanisms like first-loss positions or guarantees.

## Enabling environment opportunities

- This is largely an enabling environment activity, yet technical assistance combined with DFI funds can help PT SMI to develop and offer various risk mitigation instruments such as full or partial guarantees. Alternatively, a project preparation facility using blended finance could prove another way to offer risk mitigation instruments.
- Once enabling environment issues have been addressed, it will be useful to support the development of the local financial market for more rupiah-based liquidity. Current PPAs in U.S. dollars incur significant costs to PLN through forex and hedging risk, which was exacerbated during Covid.

# Action area 5: Enabling a just transition away from coal

The decarbonization of Indonesia's power sector will depend on supporting PLN on its energy transition journey, addressing the current issue of capacity oversupply, and replacing uneconomic or undepreciated coal assets with clean capacity. This will require advisory services to PLN and support in implementing suitable financing instruments.

## Investment opportunities

- Once a clear government commitment has been set, domestic and international intermediaries can raise finance to decommission coal assets and replace these with least-cost renewables and storage. At the outset, this will likely require DFI support.
- PLN, its subsidiaries and IPPs that have PPAs with PLN can for instance raise green/transition bonds on the project or corporate level. As PLN has good access to the bond market, this could prove a useful avenue to take. In addition, using securitization to pool and refinance uneconomic or underused coal plants off-balance sheet can provide funding for clean replacement capacity. Depending on the design, part of the revenue could support communities impacted by the coal transition.
- Further innovative financing mechanisms provided purely by DFIs such as decarbonization loans can prove valuable in establishing the market.

## Enabling environment opportunities

- The coal transition is a challenge that requires a clear decarbonization commitment from the highest political level and collaboration between a variety of stakeholders, from mine operators holding long-term coal offtake contracts with PLN to mining sector employees. Technical assistance needs to support these dialogs and processes, such as the renegotiation of fuel supply contracts or exiting coal PPAs with IPPs.
- PLN will likely require support in structuring the adequate financial instruments to decommission coal assets. Technical assistance in adjusting regulation to allow for securitization of assets can not only be useful in terms of raising debt to pay down coal assets but can also be a valuable mechanism to raise finance for impacted communities, such as for job training programs. DFI support is likely necessary to initially “prove” such a financing mechanism.
- DFI support to collaboration with institutional investors could additionally facilitate pre-identifying lenders and designing bonds to match their investment criteria.

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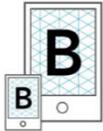
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