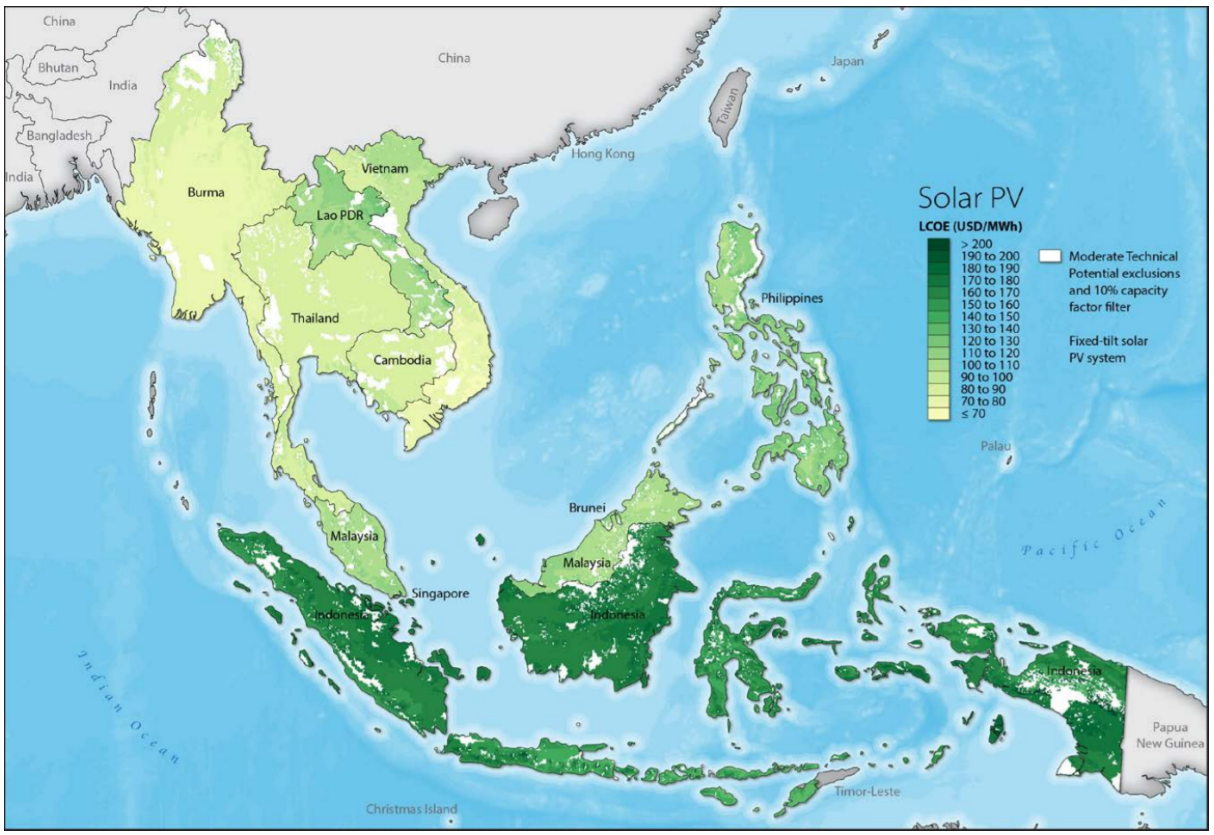
Uncover Indonesia Renewable Challenges



Solar photovoltaic levelized cost of energy across ASEAN member states for the Moderate Technical Potential Scenario. Source: NREL (2020)

Highlights

Renewable energy is in demand as global corporations lean towards ESG and sustainable development. SouthEast Asia (SEA) as an emerging market is lucrative for development and investment growth potential. Yet, renewable energy potential in the region, especially Indonesia, is still overlooked. Three key takeaways have been identified in this desk study to realize renewable development.

- Electricity policy reform is a must to allow private sector to at least do semi-direct PPA
- The policy reform is the enabler to open up more foreign investment in energy sector
- Energy innovation environment will also benefit from the market reform

Trends and Challenges

GLOBAL TRENDS

It has been five years since Sustainable Development Goals (SDGs) were initiated by the United Nations (UN). The climate change issue was identified as a grand challenge that was contributed mainly by the energy sector. Specific to energy, SDG7 aims to have access to affordable, reliable, sustainable and modern energy. Renewable initiatives are increasing globally, from transportation, the private sector in general, and energy technology.

More and more automobile companies are launching their Electric Vehicle (EV) for mass-market usage. Hybrid Electric Vehicles (HEV) are expected to become more prevalent in the

future. Aside from HEVs, manufacturers will also produce Plug-in Hybrid Electric Vehicles (PHEV) and Battery Electric Vehicles (BEV). Mobility innovations for commuting people and logistics are also mostly based on the sustainability goals enacted by the UN.

The Renewable Energy 100 percent or known as RE100 initiative, even began before the UN SDGs. Although IKEA Group and Swiss Re started it in 2014, more than 250 corporate members have followed it. Companies are vying to be involved in more sustainable energy sourcing, both buyers and sellers. As a result, countries with open power markets are enjoying sustainable energy growth.

The use of renewable energy prevents the decline of the industry amidst the global climate change issue. Instead, it encourages industries to enact energy responsibility policies while still growing the economy. While energy use is inevitably increasing, the adaptation of energy efficiency and renewable energy sources is paramount. Energy efficiency technology will play a central role in balancing the growing energy demand and emission reduction. Further, realizing renewable energy potential can also accelerate climate recovery.

RENEWABLE ENERGY IN INDONESIA

The Indonesia Ministry of Energy and Mineral Resources (MEMR) released a report on the 207 GigaWatt renewable energy potential. However, Institute for Essential Services Reforms (IESR) has identified at least 16 times more solar PV technical potential in Indonesia than the MEMR. Thus, despite the distant finding, stakeholders are aware of abundant renewable solar energy potential in Indonesia. But, more than just “awareness,” how is it going now? Several actions related to the issue by the government, State-Owned Enterprise (SOE), and private sector, such as solar PV investment, energy storage infrastructure, and tax incentives.

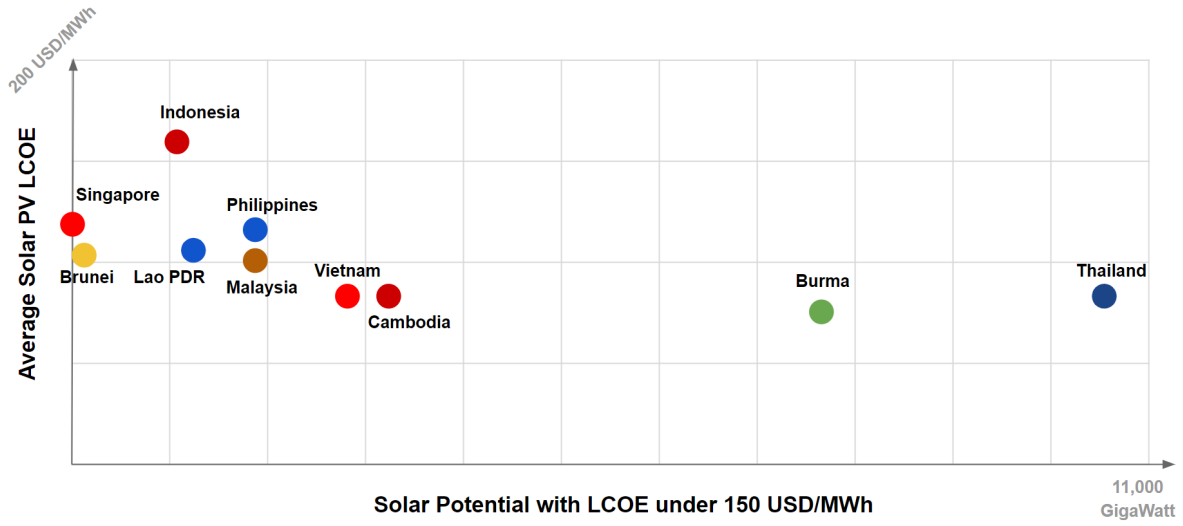
Perusahaan Listrik Negara (PLN), the sole electricity seller in Indonesia, recently signed a PPA with PMSE to roll out a floating solar PV at Cirata, West Java, with a capacity of 145 MWac. An aviation SOE, Angkasa Pura II had also recently completed solar PV covering their Airport Operation Control Center (AOCC) in Soekarno Hatta International Airport with a capacity of 241 kWp. From the private sector, Coca-Cola Europacific Partners (CCEP) Indonesia is now building their solar panel at Cibitung with a capacity of 7.34 MWp.

Four SOEs recently formed a Joint Venture called Indonesia Battery Corporation. It is planned to organize the full battery value chain from mining upstream to recycling downstream. As EV is expected to grow in the upcoming years, the SOE took the early chance to provide the end-to-end infrastructure of the energy storage supply chain. Moreover, the government has directly given incentives for the consumer side. For example, the Indonesia Ministry of Finance (MoF) has issued a tax incentive regulation for PHEV and BEV up to 14% in the financial sector. Although, wind potential as another source of renewable energy is still not explored as those efforts.

CHALLENGES

In reality, Indonesia’s government does not seem to have any tension regarding the country’s renewable energy policy. However, the 2025 energy mix scenario is also not aggressive enough to describe the government leaning towards renewables.

Indonesia's power market structure is also a challenge where there is only a single buyer and seller, PLN. However, it is difficult to reform the closed and centralized energy and electricity policy as it is still interpreted by the public as a threat to national sovereignty.



Solar Potential vs Average Solar PV LCOE among SEA countries. Source: NREL (2020) restated.

Southeast Asian Practices

The power market situation in Southeast Asia (SEA) is varied, there are open markets like Singapore and the Philippines, developed single buyer countries like Malaysia, Thailand, including the growing market of Vietnam, and a fully single-buyer power market of Indonesia.

POTENTIAL IN THE REGION

Technically, solar and wind potential of select SEA countries also vary according to the study from NREL on renewable energy potential with Levelized Cost of Energy (LCOE) under 150 USD/MWh. For example, wind potential capacity for each country ranges from 0.02 GigaWatt (GW) in Singapore to 482 GW in Burma. At the same time, potential solar capacity ranges from 2 GW in Singapore to 10,538 GW in Thailand.

LEVELIZED COST OF ENERGY

NREL has also estimated the LCOE among ASEAN countries to obtain renewable sources. The LCOE is the average cost of electricity that a generating plant would generate over its lifetime. It shows the difference between the cost of electricity that a plant would obtain and its current state. Indonesia has the highest average LCOE among others since the solar PV installation cost is assumed to be high. In contrast, Thailand has a lot of solar potential with almost half of Indonesia's LCOE.

Existing Policy

Renewable energy initiatives in Indonesia are currently focused on direct investment rather than direct corporate PPA. It is the consequence of the electricity law no. 30 the year 2009 that regulates business areas where only a single entity can operate. The business areas are primarily operated by PLN, which further strengthened PLN position.

PLN can procure the power from an Independent Power Producer (IPP). But, corporates who aim to provide and sell the power must also hold an electricity provision license or Izin Usaha Penjualan Tenaga Listrik (IUPTL) which is not easy. MEMR opened the opportunity to collaborate between utilities and IPPs by the MEMR regulation no.1 year 2015 called power wheeling mechanism. However, it is still not enough to stimulate investment growth in this industry. It requires tariff regulation and further market education.

Average Solar Photovoltaic Levelized Cost of Energy for Technical Potential Scenarios (NREL, 2020)

Countries	Average LCOE (USD/MWh)			
	Relaxed Scenario	Moderate Scenario	Restricted Scenario	Urban Scenario
Brunei	118.2	117.9	117.6	116.1
Burma	80.3	79.1	79.8	77.8
Cambodia	87.5	87.4	87.7	87.2
Indonesia	166.5	164.8	165.3	157.3
Lao PDR	111.1	110.5	110.7	107.1
Malaysia	108.0	107.5	107.5	106.1
Philippines	118.5	116.8	117.6	113.6
Singapore	123.0	123.1	122.7	123.2
Thailand	85.1	84.9	85.3	84.6
Vietnam	87.1	86.6	87.5	85.1

In the Future

There is a chance to enable the so-called corporate Power Purchase Agreement (PPA) and still put PLN in the middle. For instance, if a corporate buyer wants to sell a certain asset, the government can issue a regulation that will allow the buyer to transact through the grid of PLN. With this scenario, PLN will then act as the aggregator in at least a corporate semi-direct PPA.

The semi-open structure should not be viewed as a threat to national sovereignty. In contrast, it shall be interpreted as an enabler to open up further investment opportunities and energy sector innovation, both upstream and downstream technology. By allowing the private sector in electricity transactions, Indonesia could easily (or hardly?) enjoy more renewable energy by 2050 which is expected to be around 1600 GigaWatt in total.

PLN has just recently lowered the electricity demand forecast on their latest electricity supply business plan (RUPTL) for the year 2021-2030. PLN also revised their power plant projects' Commercial Operation Date (COD) accordingly and even terminated or replaced them by renewable energy development. They projected 24,2% of renewable energy mix to be achieved by 2030. But still, PLN renewable energy development alone will not be sufficient to supply future renewable demand.

This Policy Brief is the result of a desk study as part of between Kejora Capital and the School of Business and Management, Institut Teknologi Bandung. The data presented are secondary data obtained from journals, webinars, references on the internet through stakeholder and cost-benefit approaches.

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