



Hot Topic Brief: Emerging Policies for Mobilizing Private Sector Investment into Clean Energy in the Philippines

Sam Koebrich and Bethany Speer

National Renewable Energy Laboratory

Supported by:



Federal Ministry
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Strategic Partnership Project Report
NREL/TP-6A20-74877
December 2019

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Contract No. DE-AC36-08GO28308



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Suggested Citation

Koebrich, Sam and Bethany Speer. 2019. *Hot Topic Brief: Emerging Policies for Mobilizing Private Sector Investment into Clean Energy in the Philippines*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-74877. <https://www.nrel.gov/docs/fy20osti/74877.pdf>.

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Acknowledgements

The authors would like to thank the following thoughtful reviewers: Bert Dalusung, Sara Ahmed, Alex Aznar, and Jessica Katz. Additional support and review came from the Clean Energy Investment Accelerator (CEIA) Philippines team including Marlon Apanada, Gabriel Silan, Michelle Murphy Rodgers, Rachel Ross, and Evan Scandling.

Introduction

The Philippines has one of the highest electricity prices for commercial and residential consumers in the Association of Southeast Asian Nations (ASEAN) region with prices between \$0.12 (commercial) and \$0.20 (residential) per kilowatt-hour (kWh) (ERIA 2018). Significant reliance on imported coal and diesel is the primary cause of this cost to ratepayers. This ‘hot topic brief’ details new policies in the Philippines designed to diversify the country’s fuel-mix and the opportunities for investments in renewable energy to reduce prices for consumers and industry.

This brief focuses on two recent policies:

1. **Renewable Portfolio Standard (RPS):** The RPS establishes mandatory targets for each electric distribution utility—both publicly and privately owned—to procure renewable energy through 2030.
2. **Green Energy Option Program (GEOP):** The GEOP enables companies to independently procure renewable energy from third-party power producers, which can be used to help meet private sector renewable energy goals, unlock lower electricity costs, and increase energy security.

The first section of this report provides market context for the Philippines energy sector. Next, a detailed explanation of the RPS and GEOP policies is provided. The final section of this brief details the challenges that remain in implementing the RPS and GEOP policies.

About the Clean Energy Investment Accelerator

The Clean Energy Investment Accelerator (CEIA) is an innovative public-private partnership initiative that addresses barriers to scale the deployment of clean energy solutions for commercial and industrial consumers in emerging markets. CEIA is jointly led by the World Resources Institute (WRI), Allotrope Partners, and the U.S. National Renewable Energy Laboratory (NREL) and supported by the German and U.S. governments and other donors. The CEIA model is built on three essential pillars for mobilizing clean energy investment at scale:

- **Purchasers:** Commercial and industrial power purchasers create a demand signal for clean energy;
- **Policy:** Effective policies and regulations allow clean energy to scale; and
- **Pipeline:** A robust pipeline of clean energy projects attracts investment.

In the Philippines, CEIA focuses on bringing together private and public sector stakeholders in high-growth regions of the country to facilitate open dialogue and advance subnational mechanisms for mobilizing clean energy investment and deployment. This involves partnering with key local government units (LGUs), like the City of Santa Rosa, and bringing city officials and the local businesses together, in order to help purchasers, overcome clean energy barriers, strengthen the local policy enabling environment, and unlock a pipeline of private sector clean energy projects.

Market Context

The Philippines continues to experience rapid GDP growth with annual growth rates upwards of 6% from 2015 through 2018, making it one of the strongest-performing economies in Southeast Asia (World Bank 2019a). This growth has been matched by significant increases in the country's peak electricity demand, which has increased from 9 gigawatts in 2007 to 13.3 gigawatts in 2016, for an average increase of 4.6% per year.¹ Per capita electricity consumption has grown from 582 kWh in 2005 to 717 kWh in 2015 (PDOE 2016).

Historically, significant development of hydroelectric, geothermal, and biomass resources enabled the Philippines to maintain a relatively high penetration of renewables. For example, in 1990, 45% of electricity was supplied by renewable generators (World Bank 2019b). However, since the 1990s, the country has increasingly turned to imported coal to meet its growing electricity demand, reducing the current renewable energy mix to around 24%. As of 2017, an anticipated 10 gigawatts of new coal was in development to meet rapidly rising electricity demand (Ahmed 2019). Figure 1 displays the locations, types, and sizes of operable power plants in the Philippines. As shown, large coal plants are located close to population centers, while numerous areas have demonstrated resource potential for hydro, geothermal, solar, wind, and biomass technologies.

In response to the declining proportion of renewable electricity (PDOE 2017b), the Philippines' congress passed Act No. 9513 in 2008—referred to as the Renewable Energy Act—which called for the implementation of a suite of programs, including a feed-in-tariff (FIT), a Green Energy Option Program (GEOP), a Renewable Portfolio Standard (RPS), net metering, and various fiscal incentives for eligible renewable energy developers (Congress of the Philippines 2008).

A FIT provides a fixed per kilowatt-hour payment and priority grid access for grid-connected renewable energy generation. The FIT program was the most highly utilized renewable energy policy between 2012 and 2017 based on renewable energy generation capacity. One of the requirements of the FIT was that the renewable energy project must be built before it could qualify for the tariff. However, the policy was ultimately oversubscribed, resulting in stranded projects that could not obtain the anticipated tariff. The FIT had no geographic criteria, leading

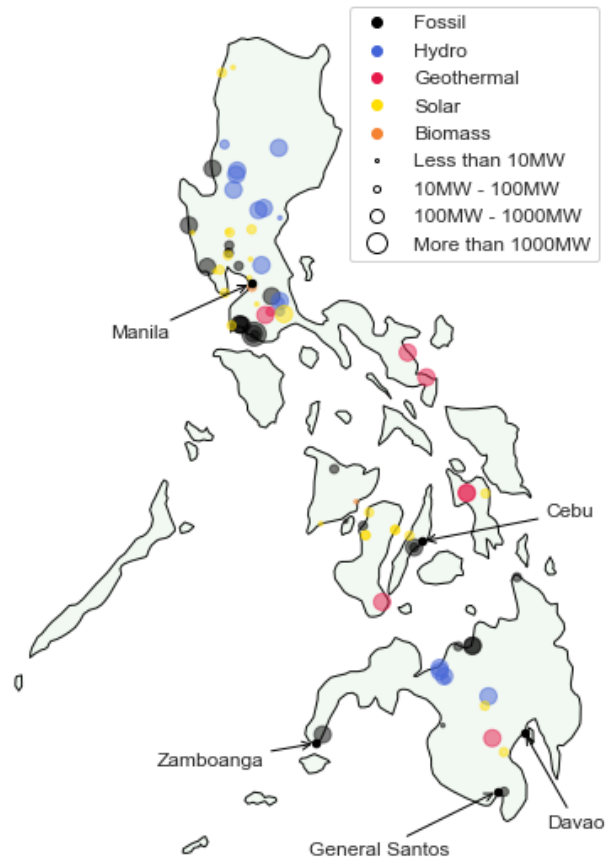


Figure 1. Power plants in the Philippines

(Koebrich 2018)

¹ Electricity demand growth data only includes interconnected areas of the Luzon and Visayas grid.

to projects installed in locations with renewable resource availability, but no access to the grid (IRENA 2017).

Policymakers are now shifting focus towards the RPS and GEOP. The RPS will establish renewable quotas for each of the 140+ electric distribution utilities (DUs) in the Philippines, while the GEOP is intended to spur commercial and industrial renewable energy procurement. Political buy-in exists too; a July 2019 directive by the Philippines President Rodrigo Duterte is fast-tracking implementation of the RPS and the GEOP to expediate program roll-out (Cruz, 2019).

New Approaches to Mobilizing Investment

Renewable Portfolio Standard

An RPS is a legislative mandate requiring utilities to procure a certain amount of renewable energy by a set date or face penalties. RPSs have been successfully implemented elsewhere, providing a record of successful clean energy investments mobilized through the policy. Examples of completed, or in progress RPSs include various states across the United States (notably California, Vermont, Hawaii, and Oregon), several Canadian provinces, Chile, Japan, the U.K., Australia, and other countries (Heeter et al. 2019). Unlike voluntary targets, an RPS typically has penalties—financial, or in the case of the Philippines, criminal—associated with failing to meet mandates (Heling 2017).

In the Philippines, an RPS was included in the 2008 Renewable Energy Act, with the final RPS rules being released in 2017. The Philippines’ Department of Energy (PDOE) is currently working to implement the RPS by raising the distribution utilities’ awareness of the RPS requirements. The “transition period” began in 2019, and 2020 will be the first year of mandated RPS compliance. The RPS currently stipulates that all DUs, electricity suppliers, and generating companies increase their renewable generation by 1% per year for 10 years. The National Renewable Energy Board (NREB) is empowered with altering this percentage for future years. Functionally, the PDOE is planning to use the RPS to meet their goal of an average utilization rate of 35% renewable electricity across the country by 2030. The PDOE permits the development of “biomass, waste to energy technology, wind, solar, run-of-river, impounding hydropower sources that meet internationally accepted standards, ocean, hybrid systems, geothermal and other RE technologies that may be later identified by the [P]DOE” as part of their RPS (PDOE 2015).

Renewable Energy Certificates (RECs) are the primary method used to demonstrate compliance. RECs are a commodity created for every megawatt-hour of power generated by a renewable resource. RECs are a separate instrument from the power itself and are intended to put a monetary value on the non-economic benefits of renewable energy, such as reduced greenhouse gas emissions, reduced air pollution, and increased energy security. RECs can be generated by the utility or purchased from third parties, as long as the source of the RECs meets specific criteria defined in the RPS.

Under some RPS structures, online REC trading markets are established to facilitate measurement and tracking, especially for power systems where there are many obligated entities,

as is the case in the Philippines with its 140+ DUs. In the Philippines, a REC market is being built on top of the existing wholesale energy spot market, which functions as a real-time electricity clearinghouse for the Philippines' two northern island groups (Luzon and Visayas). The market will enable DUs to sell surplus RECs to one another, or to allow third-party sellers to offer RECs to DUs and other actors wishing to make voluntarily purchases. Other customers in the market may include corporations or entities procuring RECs for voluntary green energy programs. To ensure DUs can demonstrate adherence to RPS requirements, the renewable energy market will need to be functional by the end of 2019—the 'transition' year for the RPS (PDOE 2017b).

Green Energy Option Program

Private sector businesses are increasingly investing in renewable energy around the world—some 47% of companies with headquarters in Asia and 45% in North America are actively procuring renewable electricity (IRENA 2018). Various motivations behind companies' decisions to buy renewable energy include lowering costs, hedging against potential price increases, meeting customer and investor demands, adopting sustainability practices, and implementing climate change commitments.

Several mechanisms are available to corporations for procuring renewable energy. One key mechanism is a Power Purchase Agreement (PPA), which is a long-term contract for renewable energy (typically for 15–20 years). Some companies pursue shorter contracts (e.g., 5–7 years), although shorter contracts are typically priced higher. PPAs ascribe a yearly kilowatt-hour electricity rate between an Independent Power Producer (IPP) and an offtaker, such as a utility, corporate entity, manufacturer, or other business. PPAs can be structured as either physical delivery of power (onsite or offsite) or as financial contracts for differences between power consumption and generation (also known as synthetic or virtual PPAs) (Bird 2017). Although construction of renewable energy projects may require a large upfront investment, the absence of fuel costs and low maintenance requirements often allow power to be produced at a lower price than fossil fuel-based generators, especially when assessed over a multi-year period as part of a PPA (IRENA 2018).

Figure 2 describes in detail the series of transactions involved in a PPA. In the case of the Philippines, where electricity rates are the highest in Southeast Asia, many companies could experience significant benefits including security of supply and lower electricity costs from purchasing renewable electricity through PPAs.²

² For more information on the customer economics of corporate adoption of renewable energy in the Philippines, see the Clean Energy Investment Accelerator's *Procurement Guidebook for the Philippines*: <https://www.cleanenergyinvest.org/resources>

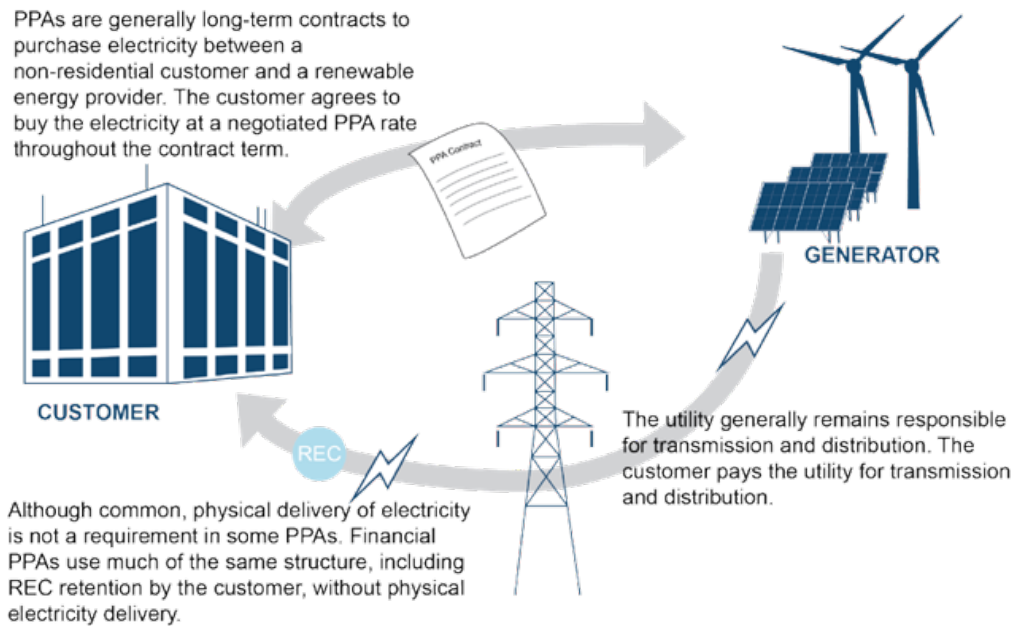


Figure 2. How power purchase agreements work

The figure provides a simplified schematic for visualization purposes. Specific contract structures may vary (O'Shaughnessy et al. 2017).

The delivery (transmission and distribution) of the electricity is an important issue to address with physical PPAs. In many markets, electric utilities have a legal franchise to act as the sole provider of electricity within a territory, and other entities cannot use grid infrastructure. The Philippines' new 'Green Energy Option Program' (GEOP) resolves this issue by allowing registered third-party renewable energy developers to use DU's distribution infrastructure to deliver electricity to program participants. In return, the DUs are compensated with a 'wheeling charge' by the developer or offtaker. The wheeling charge is a small fee incurred for sending power through the grid. Though initially the program will only be available to large commercial customers (those customers with an average monthly peak capacity greater than 100 kW), the next phase of the program could be expanded to allow access to all customers, unlocking further business and investment opportunities. As per current rules, in order to participate in the GEOP, a developer must obtain a 'Retail Electricity Supplier' (RES) license from the PDOE.

The GEOP offers an advantage to the DUs in meeting their RPS requirements as the utility retains all RECs from the electricity delivered by third-party developers that use the utility's distribution grid. For example, if a factory in Baguio City, Philippines, signs a PPA with a developer for a new solar power plant, the developer will work with the Benguet Electric Cooperative (BENECO) to coordinate the delivery of the electricity over BENECO's distribution system, for which BENECO receives a small wheeling charge for every kilowatt-hour delivered. BENECO gets one REC for each megawatt-hour of renewable electricity the developer delivers using their distribution system. BENECO can apply these RECs towards their RPS obligation. Additionally, BENECO promises to deliver power to the factory should the developer's solar plant ever go offline. In this example, the factory gets renewable power at a lower cost than the retail electricity rate, and BENECO gains RECs at minimal cost.

For some DUs, it can make more economic sense to allow commercial and industrial consumers to procure renewable energy independently through PPAs than for the DU to purchase additional renewable electricity themselves.

Challenges to Rapidly Scaling Private Sector Investment within the Existing Policy Framework

Control of RECs by DUs

The Philippines uniquely grants all RECs from the GEOP, net metering,³ and the FIT programs to DUs. In other countries with similar programs, third parties typically retain control of RECs they generate (or RECs that are associated with electricity they purchase from a third-party developer). While the Philippines' system benefits DUs, it is unclear what impact this will have on customer uptake of programs like the GEOP and whether this will negatively impact investment.

Particularly for multinational corporates with renewable energy commitments and their suppliers, the inability to retain ownership of RECs could limit corporate participation in these renewable energy programs. First, if the company aims to verify attributes of their renewable energy consumption (associated with pledges and platforms such as RE100, Science Based Targets, and Carbon Disclosure Project), the company must retain and retire the associated RECs to avoid double-counting. Companies with an international footprint are accustomed to retaining RECs and could be hesitant to invest in the Philippines given the current policy framework. Alternatively, for those companies that are not interested in making claims of using renewable energy, there could be a missed economic opportunity to sell RECs.

Low Awareness of the RPS from Distribution Utilities

Meeting RPS mandates requires diligent planning, otherwise unprepared DUs will face last-minute compliance decisions that could incur additional costs. For example, purchasing unbundled RECs at the last-minute through the renewable energy market could be more expensive than procuring additional renewable capacity in advance of compliance deadlines. Thus, it is important that the DUs have advanced awareness of the RPS requirements so that they can adhere to the requirements utilizing the most cost-effective pathways that also meet reliability and security of supply standards.

In preliminary consultations conducted by the Clean Energy Investment Accelerator with DUs,⁴ those utilities located far outside Metro Manila have demonstrated more limited awareness of the RPS requirements. The PDOE has been actively working to increase the DU's understanding of the RPS through a series of consultations throughout the country. However, effectively communicating the new mandates and ensuring all 140+ DUs have adequate capacity to meet these mandates is a significant challenge. Many of the DUs lack experience integrating significant levels of variable renewable energy generation into their grids, and in these cases,

³ The Philippines' net metering program allows customers to install rooftop photovoltaic system under 100 kW in size. A rooftop system displaces the customer's demand while supplying excess generation to the distribution system. When energy is injected to the grid, the customer is credited at a blended rate (around 40% of the retail rate for most DUs in the Philippines) in effect 'rolling-back' the customer's meter. DUs have ownership of all RECs from the net metered system.

⁴ See www.cleanenergyinvest.org.

engaging in capacity building ahead of implementation is beneficial. Also, encouraging DUs to provide RPS compliance plans ahead of yearly requirements is a best practice to ensure plans can feasibly meet mandates. The Clean Energy Investment Accelerator is supporting DUs with an online RPS planning calculator which allows DUs to model various procurement scenarios, which could help inform RPS compliance plans.⁵

Uncertain RPS Targets

Rather than establishing a single target that all DUs must meet (e.g., 35% of generation from renewables), the Philippine RPS requires each DU to meet an annual percentage increase in renewable generation. The percentage for each forthcoming compliance year is to be disclosed by the PDOE by September of the previous year (for example, the percentage increase to be met in 2025 will be disclosed in 2024). The PDOE has established the anticipated yearly increase to be 1%, although this is subject to change based on recommendation from the NREB. Mandated RPS compliance begins in 2020 and is anticipated to be in effect through at least 2030. The RPS is unclear about what will occur beyond 2030, and whether new renewables will need to be brought online to further increase the penetration of renewables in the electricity mix. The percent of electricity sourced from renewables in the Philippines has been in decline since 2000, while the RPS aims to reverse this trend. Figure 3 shows projections of renewable penetration under scenarios with and without successful RPS implementation.

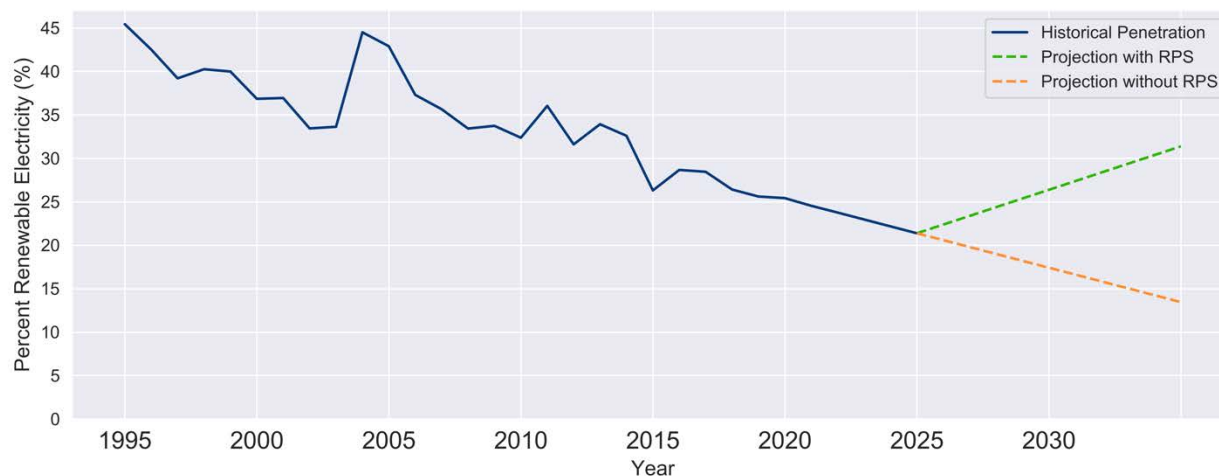


Figure 3. Penetration of renewables in the Philippines' energy mix

Projection using ARIMA(1,1,0) model between 2016-2030 (World Bank, 2019b).

Counting FIT Production Toward the RPS

It is unclear how subsequent rounds of the FIT will be integrated into the RPS. FIT programs offer a guaranteed rate to renewable power producers over the life of a contract (e.g., in 2017, the Philippines accepted 417 megawatts of solar capacity at a rate of \$0.16 per kilowatt-hour produced for 20 years) (PDOE 2017c). The cost for this generation is added to the rate paid by all customers in the country. The PDOE has established that RECs generated through FIT

⁵ The online RPS calculator tool is available at: <https://phl-rps-calc.herokuapp.com/>

projects will be distributed proportionally amongst DUs based on their percentage of overall energy sales in the country. For some DUs, the number of FIT RECs received could be adequate to meet the RPS for the first few years of compliance, diminishing the incremental renewable energy procurement requirement of the RPS. Because FIT RECs are distributed proportionally to DUs regardless of location, some DUs may obtain more FIT RECs than what is proportional to the renewable energy generation integrated into their grid.

Potentially Variable REC Prices

Somewhat unique to the Philippines RPS is that it does not establish a per-megawatt-hour alternative compliance payment for REC shortfalls. Elsewhere, an alternative compliance payment serves as a ceiling on REC prices by providing a fixed, noncriminal penalty for REC shortfalls. Without this, there is no constraint on the upper bounds of REC prices. In the case that enough renewable capacity is not brought online in time, REC prices in the Philippines could skyrocket as DUs attempt to avoid the heavy penalties—including potential criminal liability—that result from noncompliance. Long-term PPAs, like those now allowed by the GEOP, could help prevent volatility in REC markets.

Volatile Electricity Prices

Because of a lack of domestic non-renewable energy sources, the Philippines imports a substantial portion of its fuel needs, which contributes to decreased energy security and high generation prices. As mentioned, the Philippines has the highest retail electricity rates in Southeast Asia, with prices between \$0.12 (commercial) and \$0.20 (residential) per kilowatt-hour (kWh) (ERIA 2018).⁶ Rates exhibit significant variability annually and seasonally, which can make planning difficult for large energy users in the commercial and industrial sectors (MERALCO 2019). The PDOE directly attributes the high rates and variability to a lack of government subsidies for conventional generation (PDOE 2017d). Figure 4 shows a sampling of MERALCO's (the largest DU) electricity rates from recent years compared with BNEF's Levelized Cost of Energy (LCOE) plus estimated wheeling charges. The LCOE represents an all-in estimate of the cost of solar PV on a per kWh basis, and while the LCOE has been consistently declining, it can still be difficult for PV to compete with incumbent generation for a variety of reasons. For example, long-standing policies allow large fossil-fuel generators to automatically pass-through fuel charges and foreign-exchange rate fluctuations directly to consumers. This results in utilities having little fiscal incentive to reduce generation costs despite the fact that renewable resources may be less expensive on a per-kWh basis than imported fossil fuels (Ahmed 2019).

⁶ Exchange rate of 52 pesos per USD



Figure 4. Historic MERALCO rates compared with solar levelized cost of energy + wheeling charges

Country specific LCOE data from Bloomberg, with wheeling charges estimated in accordance with a formula provided by the Philippines Energy Regulatory Commission (BNEF 2019, MERALCO 2019, Philippines Energy Regulatory Commission 2016).

Identifying Potential GEOP Participants

The GEOP offers a clear entry point to rapidly mobilize investment in renewable energy in the Philippines. Communicating this opportunity to eligible customers is critical to ensure the success of the program. Multinational corporations with eligible facilities in the Philippines may be familiar with renewable energy procurement from experience in other countries but may not have a high level of awareness of the new opportunities available to them in the Philippines. Similarly, domestic firms could be unfamiliar with procuring renewable energy and unclear about how to begin the PPA process. Working with both domestic and multinational firms to convey the benefits and accessibility of renewable energy is essential. The creation of renewable energy buyers’ groups, standardized PPA agreements, and powerful communication campaigns can help mobilize investment and unlock the full potential of the GEOP.

Extending the GEOP to Smaller Customers

While the GEOP currently provides details for the participation of larger commercial and industrial electricity users, the PDOE intends to open the program to all customers once it has determined that “technical requirements and standards are already met.” (PDOE 2018) It is unclear which technical requirements need to be met, or what the timeline to expand the program would be. Once expanded, all customers may be able to ask their DU to purchase renewable energy on their behalf through a “Green Tariff” program, which has already been implemented in parts of Australia, Europe, Singapore, and the United States.

Timescale of Balancing GEOP Generation and Consumption

The PDOE Department Circular authorizing the GEOP program states that a PPA must provide 100% of the customer’s ordinary power consumption, but it is unclear at what time scale this is balanced (PDOE 2018). For example, if balancing is required to be instantaneous then customers would have to align their power consumption with the real time generation of their PPAs. This would be extraordinarily difficult for the power provider and offtaker to coordinate. Similar programs in the United States typically balance at a monthly level. The CEIA is working with

the PDOE to properly clarify the timescale of the GEOP’s balancing requirement while realizing that smaller timescales will create burdens that discourage participation.

Potential for Stranded Coal Assets

The Philippines has 10,423 MW of coal projects currently in the project pipeline, amounting to US \$20.9 billion of project capital (Ahmed 2019). Many of these projects are being secured through long-term power supply agreements with the government. If less expensive renewables are able to compete, these coal projects could become stranded, meaning that they continue to operate despite being uneconomic. Because the Philippines automatically passes through generation charges to customers, this risk primarily impacts ratepayers. Figure 5 displays a number of power supply agreements signed in the Philippines, showing the long-duration and high-cost of fossil fuel agreements when compared with the declining cost of solar PPAs.

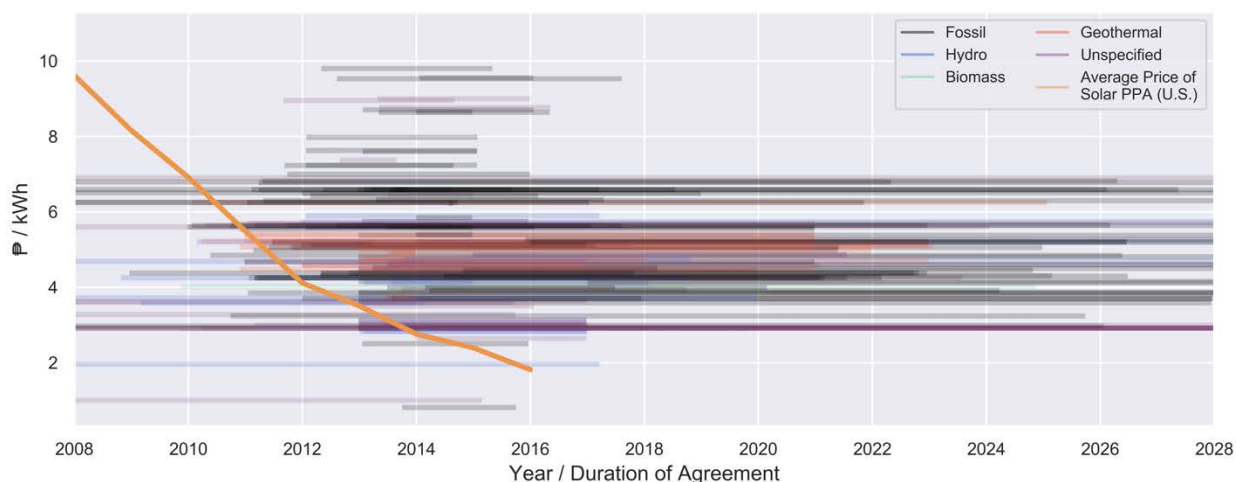


Figure 5. Price and duration of utility power supply agreements in the Philippines compared with average price of solar PPA

Horizontal lines represent multi-year power supply agreements signed between utilities and power suppliers. (Kuryente 2019, LBNL 2018)

The Path Forward

Educating stakeholders of their responsibilities and options under the RPS and GEOP is a critical next step in achieving the Philippines’ goal of a diversified fuel mix. The Clean Energy Investment Accelerator is facilitating dialogue with key parties, including the PDOE, DUs, and businesses to assess the optimal ways to leverage the RPS and GEOP to achieve renewable energy targets in the Philippines while lowering electricity prices and improving grid reliability.

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