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

September 2018

The Philippines set a goal of reducing country-wide greenhouse gas (GHG) emissions 70% by 2030 in their Intended Nationally Determined Contribution (NDC) under the Paris Agreement on climate change.[1] A significant portion of the reductions required to implement this pledge will need to come from the power sector, which is the largest source of emissions in the country.[2] To achieve this, new demand signals to the energy market are being created and additional renewable resources are needed. This hot topic brief details new policies in the Philippines and the opportunities they present for investments in clean and advanced energy. The majority of this brief will focus on two recent policies:

1) Renewable Portfolio Standard (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): Enables companies to independently procure renewable energy from third party power producers, which can be used to help meet private sector renewable energy goals while unlocking lower electricity costs and increased energy security.

1 Republic of the Philippines. "Intended Nationally Determined Contributions Communicated to the UNFCCC." October 2015. http://www4.unfccc.int/submissions/INDC/Published%20Documents/Philippines/1/Philippines%20-%20Final%20INDC%20submission.pdf

2 Climate Links. *USAID*. "Greenhouse Gas Emissions in the Philippines." 2016. https://www.climatelinks.org/sites/default/files/asset/document/2016_USAID_Philippines%20GHG%20Emissions%20Fact%20Sheet.pdf Electricity/Heat are tracked as a single sector.

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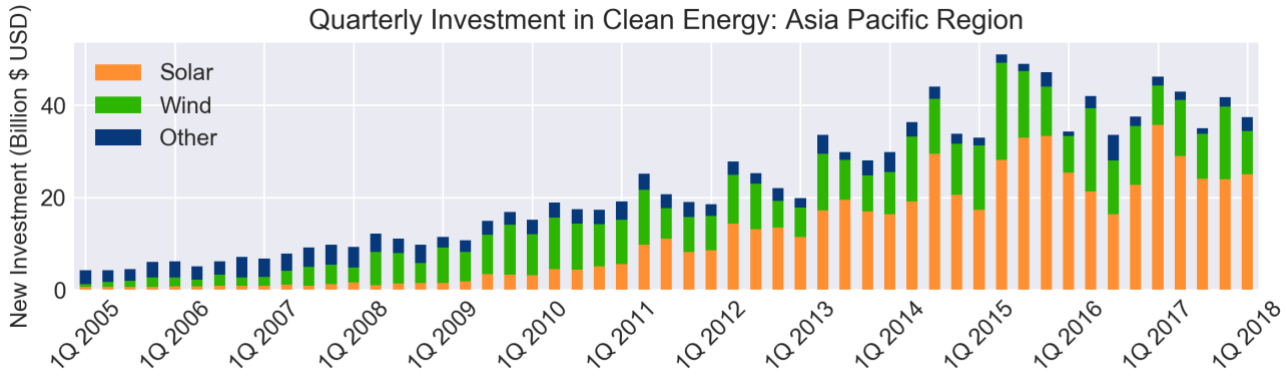


Each of these policies presents new modalities for mobilizing clean energy investment while helping the Philippines meet their 2030 NDC target. While the target is significant, the entire Asia-Pacific region is experiencing growth in clean energy investment as displayed in the figure below.[3] While much of this growth has been enabled by continued year-over-year declines in technology costs, a multitude of similar policies has successfully spurred growth in renewables elsewhere in the Asia-Pacific region and around the world. The final section of this brief will outline where clarity is still needed to understand the scale of the investment opportunities related to these policies.

Market Context

The Philippines has experienced rapid economic growth, averaging 5.6% over the past 10 years[4]. This has been matched by significant increases in the country's peak electricity demand, which has grown from 9 GW in 2007 to 13.3 GW in 2016, an average rate of 4.6% per year.[5] For many decades, significant development of hydroelectric, geothermal, and biomass resources had enabled the Philippines to maintain a relatively high penetration of renewables. For example, in 1990 45%[6] of electricity was supplied by renewable generators. However, since the 1990s, the country has increasingly turned towards coal to meet its growing electricity demand, reducing the current renewable energy mix to around 24%. As of 2017, an anticipated 10 GW of new coal was in development to meet rapidly rising electricity demand.[7] The figure below displays the locations, types, and sizes of operable power plants in the Philippines. As shown, large coal plants are located close to population centers, but numerous areas have demonstrated resource potential for hydro, geothermal, solar, and biomass technologies.

3 Bloomberg New Energy Finance. "Clean Energy Investment Trends, Q1 2018."

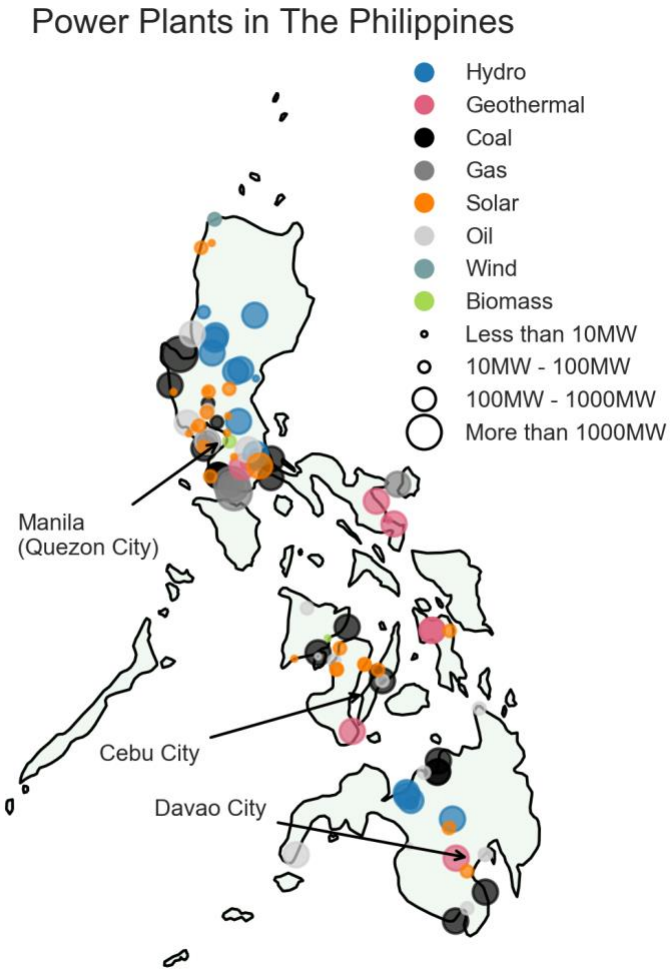
4 The World Bank. Indicator 'NY.GDP.MKTP.KD.ZG'. 2017.

5 Philippines Department of Energy. "Power Statistics." 2016. Only including Luzon/Visayas https://www.doe.gov.ph/sites/default/files/pdf/energy_statistics/annual_system_peak_demand_per_grid_2016.pdf

6 The World Bank. Indicator '4.1_SHARE.RE.IN.ELECTRICITY'. 2017.

7 Institute for Energy Economics and Financial Analysis, the Institute for Climate and Sustainable Cities. "Carving out Coal in the Philippines: Stranded Coal Assets and the Energy Transition." 2017. http://icsc.ngo/sites/default/files/resources/Carving%20out%20Coal%20in%20the%20Philippines_IEEFA%26ICSC_ONLINE_12Oct2017.pdf

In response to the declining proportion of renewable electricity,[8] the Philippines Congress passed Act No. 9513[9] 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 solar developers. A FiT is a per kilowatt-hour (kWh) payment and priority grid access program for feeding renewable energy generation into the grid. The FiT program was the most active policy between 2012 and 2017, however it faced a number of difficulties due to oversubscription, resulting in stranded renewable energy projects that could not obtain the anticipated FiT. Policymakers are now shifting focus towards the RPS and GEOP. The RPS will establish renewable quotas for each of the 144 electric distribution utilities (DUs) in the Philippines, while the GEOP is intended to spur commercial and industrial renewable energy procurement.



New Approaches to Mobilizing Investment

Renewable Portfolio Standard

An RPS is a legislative mandate for utilities to increase their use of renewable resources such as solar, wind, hydropower, and biomass. An RPS establishes yearly quotas for utilities to meet; typically mandates are based on a desired penetration of renewables. In the Philippines, an RPS was included in the Renewable Energy Act, the final RPS rules were released in 2017, and the RPS is now moving into implementation. The Philippines Department of Energy is presently working with DUs to raise awareness of the RPS. The 'transition period is slated to begin in 2019 and 2020 will be the first year of mandated RPS compliance. The RPS is anticipated to require all DUs, electricity suppliers, and generating companies to increase their renewable generation by 1% per year for 10 years. Functionally, this should lead the Philippines towards meeting their goal of 35% renewable electricity by 2030.

8 Philippines Department of Energy. "Summary of RPS Forum." 2017. https://www.doe.gov.ph/sites/default/files/pdf/announcements/rps_summary_open_forum.pdf

9 https://www.transco.ph/pdf/RA-9513-renewable_energy_act.pdf

RPSs have been successfully implemented elsewhere, providing a track record of successful clean energy investments mobilized through this policy. Examples of completed or in progress RPSs include various states across the U.S. (notably California, Vermont, Hawaii, and Oregon), several Canadian provinces, Chile, Japan, the UK, Australia, and other countries. Unlike voluntary targets, an RPS typically has penalties (financial, or in the case of the Philippines, criminal) associated with failing to meet mandates. One method that has been used to demonstrate compliance in other countries is through Renewable Energy Certificates (RECs), which are a commodity created for every megawatt-hour (MWh) of power generated by a renewable resource that are separate from the power itself. RECs are intended to put a monetary price on the non-economic benefits of renewable energy, such as reduced GHG 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.

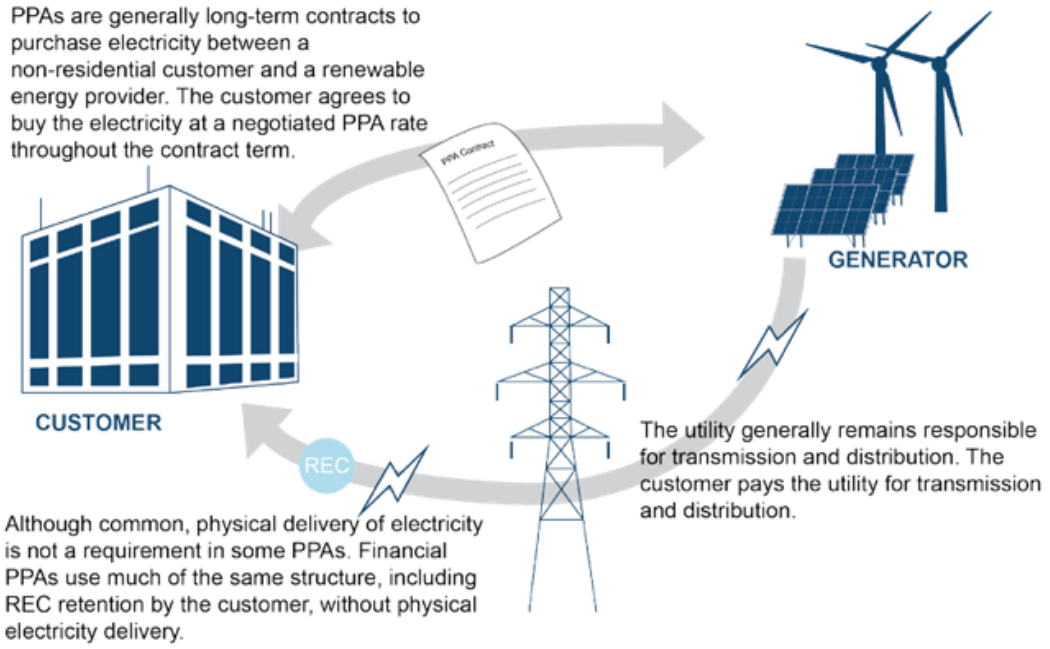
Under some RPS structures, online REC trading markets are established to facilitate measurement and tracking, especially for power systems where there are many obligated entities, as is the case in the Philippines with its 144 DUs. In the Philippines, the Renewable Energy Market (REM) is under development to serve these purposes. The REM is being built on top of the existing Wholesale Energy Spot Market (WESM) which functions as a real-time electricity clearing house for the Philippines' two northern island groups (Luzon and Visayas). The market will enable one DU to sell surplus RECs to another; or for third-party sellers to offer RECs to DUs and other actors wishing to voluntarily purchase RECs. To ensure that DUs can demonstrate they are meeting RPS requirements, it is critical that the REM is functional by 2019—the 'transition' year for the RPS.[10] Other customers in the market may include corporations or other entities procuring RECs for voluntary green energy programs.

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.[11] There are a variety of motivators behind companies' decisions to buy renewable energy, including lower costs,price hedging, meeting customer and investor demands, adopting sustainability practices, and implementing climate change commitments.

10 Philippines Department of Energy. "Department Circular No. DC2017-12-0015." 2017. https://www.doe.gov.ph/sites/default/files/pdf/issuances/dc2017-12-0015_1.pdf

11 International Renewable Energy Agency. "Corporate Sourcing of Renewables: Market and Industry Trends." 2018. https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf



There are several mechanisms available to corporations to procure renewable energy. One key mechanism is a Power Purchase Agreement (PPA), which is a contractual purchase of renewable electricity over a relatively long time frame.[12] PPAs often last for 15-25 years, although some companies are pursuing shorter contracts, e.g., 5-7 years. PPAs typically ascribe a yearly kilowatt-hour (kWh) electricity rate between the renewable energy generator and an offtaker, such as a 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(also known as synthetic or virtual PPAs). While constructing renewable energy projects may require a large upfront investment, the absence of fuel costs and low maintenance often allow power to be produced below commercial electricity rates, especially when assessed over a several year period as part of a PPA. In the case of the Philippines, where electricity rates are the highest in Southeast Asia, many companies could experience significant benefits from purchasing renewable electricity through PPAs.

An important issue to address with physical PPAs is the delivery (transmission and distribution) of the electricity. 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 by allowing registered third-party renewable energy developers to deliver electricity over DU wires to large customers (those with an average monthly peak capacity greater than 100 kW). In return, utilities are compensated with a 'wheeling charge' by the developer or offtaker. The wheeling charge can be envisioned as a virtual postage stamp where a small fee is charged for sending power through the distribution and/or transmission grid. While the program will only be available to large commercial customers at first, it could be expanded to allow all customers to access the GEOP, unlocking further investment opportunities.

12 Graphic from Source: O'Shaughnessy, E., J. Heeter, J. Cook, and C. Volpi. 2017. *Status and Trends in the U.S. Voluntary Green Power Market (2016 Data).* NREL/TP-6A20-70174.

One advantage the GEOP offers DUs is that they retain all RECs from the electricity delivered by third-party developers who use their distribution infrastructure. For instance, if a shoe company with 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 kWh delivered. BENECO gets one REC for each MWh of renewable electricity that the developer delivers using their distribution system. Additionally, BENECO promises to deliver power to the shoe company should the developer's solar plant ever go offline. In this example, the shoe company gets renewable power at a lower cost than the retail electricity rate, and BENECO gains RECs at minimal cost. For some DUs, it could make more economic sense to encourage corporate investment in renewables through PPAs rather than for the DU to purchase additional renewable electricity themselves. Because of this, it is critical for all stakeholders to work together in leveraging corporate renewable energy investment in the Philippines.

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

DUs Maintain Control of RECs

The Philippines uniquely grants all RECs from the GEOP, net energy metering,[13] and the FiT programs to DUs. In other countries with similar programs, third parties typically retain control of RECs they generate (or RECs 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.

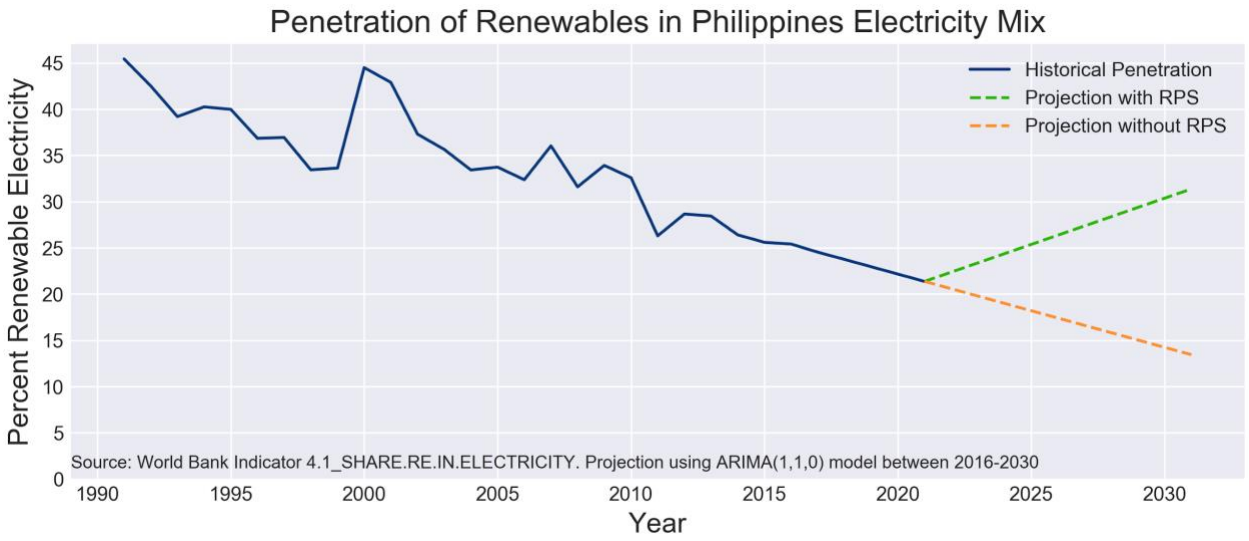
Particularly for major companies, the inability to retain ownership of RECs could limit corporate investment. First, if the company aims to verify attributes of their renewable energy consumption (associated with claims like 'our factory is powered by 100% renewable electricity'), the company must retain 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 if they will not be keeping RECs. Furthermore, companies would miss the economic opportunity to sell the associated RECs through markets (such as the REM) which can be an additional revenue stream for renewable projects if the company does not wish to make make claims of renewable energy consumption.

Low Awareness of the RPS from Distribution Utilities

Meeting RPS mandates requires diligent planning; otherwise unprepared DUs will face last-minute compliance decisions that may be costly. For example, purchasing unbundled RECs at the last minute through the REM is likely to be more expensive than procuring additional renewable capacity in advance of compliance deadlines. In preliminary consultations with DUs conducted by Clean Energy Investment Accelerator (CEIA), DUs outside of metro-Manila have

[13] The Philippines' net metering program allows customers to install rooftop photovoltaic system under 100 kW in size. A roof-top 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.

demonstrated little awareness of the RPS. The DOE hopes to help DUs increase their understanding their compliance targets ahead of the 2019 transition period, but effectively communicating the new mandates and ensuring all 144 DUs have adequate capacity to meet these mandates is a significant challenge. Some DUs lack experience integrating variable renewable energy resources, and in these cases, it is beneficial to engage in capacity building ahead of implementation. Also, encouraging DUs to provide RPS compliance plans ahead of yearly requirements is a best practice to ensure that plans are feasible to meet mandates.



Uncertain RPS Targets

Rather than establishing a single target (i.e., 35% of generation from renewables) that all DUs must meet, the RPS requires each DU to meet an annual percentage increase in renewable generation. The percentage for the following compliance year is to be disclosed by the DOE by September of the previous year (for example, the percent increase to be met in 2025 will be disclosed in 2024). The DOE has established the anticipated yearly increase to be 1%, although this is subject to change. Mandated RPS compliance begins in 2020 and is anticipated to be in effect through at least 2030. The RPS is unclear regarding 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.

Counting FiT Production Toward the RPS

It is unclear how the FiT program in the Philippines, which has been operating since 2012, will be integrated into the RPS. FiT programs offer a guaranteed rate to renewable power producers over the life of a contract (e.g. the Philippines accepted 417 MW of solar capacity at a rate of P8.68 per kWh produced for 20 years).[14] The cost for this generation is added to the rate paid by all customers. The DOE has established that RECs from FiT producers will be eligible for the RPS, but it is unclear how they will be distributed amongst DUs. Depending on how the RPS is

14 Philippines Department of Energy. *16 Solar Plants Secure FiT Rates*. 2017. https://www.doe.gov.ph/energists/index.php/96-categorised/energy/energy-resources/renewable-energy/solar-energy/11671-16-solar-plants-secure-fit-rates

read, RECs could be alloted uniformly, or based on the location of a FiT plant within a DU's territory. In some cases, this could disproportionately affect the RPS requirements of DUs. 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 initial impact of the policy.

Potentially Variable REC Prices

Unlike other RPSs, the Philippines does not establish a per-MWh 'alternative compliance payment' (ACP) for REC shortfalls. Elsewhere, an ACP serves as a cap on REC prices by providing a fixed, non-criminal 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 non-compliance. Long-term PPAs, like those now allowed by the GEOP, could help prevent volatility in REC markets.

Impact of Renewables on Electricity Prices

Due to a lack of domestic, non-renewable energy sources, the Philippines imports a substantial portion of its fuel, leading to low energy security and high generation prices. The Philippines has the highest retail electricity rates in Southeast Asia, with 2017 rates of P7.49 and P8.90 ($0.14 and $0.17) per kWh for commercial and residential customers respectively.[15] Rates exhibit significant variability based on location.[16] The DOE directly attributes these high rates to a lack of direct government subsidies.[17] Renewable resources often have a high up-front cost and a long pay back period, so careful planning and investment is needed, but declining costs of renewable technologies make these sources cost-effective alternatives to imported fossil fuels.

Identifying Potential GEOP Participants

The GEOP offers a clear entry point to rapidly mobilize investment in the Philippines. Communicating this opportunity to eligible customers is critical to ensure the success of the program. Multinational firms with eligible facilities in the Philippines may be familiar with renewable energy procurement in other countries, but could be unaware of the new opportunities available to them in the Philippines. Likewise, domestic firms could be unfamiliar with procuring renewable energy and unclear about how to engage in the PPA process. Working with both domestic and multinational firms to convey the benefits and accessibility of renewable energy is key. 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.

Onsite Power Generation Within the GEOP

The GEOP primarily focuses on wheeling electricity between an off-site renewable generator and a large customer, but questions remain for customers seeking to install generation onsite. It is already possible under the current net metering program for customers to install up to 100 kW of renewable generation onsite and export additional generation to the grid. However, if a company aims to install more than 100 kW of renewable capacity, they must use the GEOP,

15 Exchange rate of 53 pesos per USD.

16 http://www.kuryente.org.ph/ is an online resource for customers to compare rates between distribution utilities.

17 Philippines Department of Energy. "Philippine Electricity Rates Still Highest in Southeast Asia." 2017. https://www.doe.gov.ph/energists/index.php/83-categorised/electric-power-industry/12561-philippine-electricity-rates-still-highest-in-southeast-asia

which does not discuss onsite generation. Installing generation onsite could reduce wheeling charges, system losses, and property leasing costs to decrease overall system costs. Enabling onsite applications above 100 kW under the GEOP also could present one of the fastest options for bringing new renewables online, but additional policy clarity is needed to better understand how this would be permitted.

Extending the GEOP to Smaller Customers

While the GEOP currently provides details for the participation of larger commercial and industrial electricity users, the DOE intends to eventually open the program to all customers once it has determined that "technical requirements and standards are already met."[18] It is unclear which technical requirements need to be met, or what the timeline is to expand the program. Once expanded, all customers would likely be able to ask their DU to purchase renewable energy on their behalf through a 'green tariff' program as has been implemented in parts of the U.S., Europe, Australia, and Singapore.

The Path Forward

While there are many opportunities for increased renewable energy investment in the Philippines, educating stakeholders of their responsibilities and options under the RPS and GEOP is a critical step in accelerating the clean energy transition. The CEIA is facilitating dialogue with key parties including the Philippines Department of Energy, 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 costs and improving grid reliability.

18 Philippines Department of Energy. "Department Circular No. DC2018-07-0019." 2018. https://www.doe.gov.ph/sites/default/files/pdf/issuances/dc2018-07-0019.PDF