CLEAN ENERGY INVESTMENT ACCELERATOR

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

September 2018

Vietnam is experiencing strong economic growth, with average annual growth in Gross Domestic Product (GDP) on the order of 5% from 2006 – 2017,[1] and is expected to increase to roughly 6.5% in 2019 and 2020.[2] To fuel this economic growth, Vietnam will need to provide more electricity to meet greater demand, which is anticipated to increase at a rate of 8 to 12% per year between 2018 - 2030.[3] Vietnam has plans to meet this increased demand by building out additional power capacity through a variety of technologies, including utilizing significant renewable energy resources, such as wind, solar PV, biomass, and small hydro. Vietnam set a goal of reducing country-wide greenhouse gas (GHG) emissions 8% below the 2030 Business as Usual (BAU) scenario in their Nationally Determined Contribution (NDC) under the Paris Agreement on climate change. Vietnam's NDC states that this amount could realistically be raised to 25% contingent on international and private sector funding.[4] Despite this commitment to reduce GHG emissions, Vietnam also intends to add roughly 40 Gigawatts (GW) of new coal,[5] the equivalent of around 40 to 80 large power plants. If Vietnam and other significant emerging economies in Southeast Asia lock in coal investments at these levels for the next 40 years or so, it will be difficult or infeasible to meet Paris targets.[6]

While the coal component presents climate development challenges, Vietnam's strategy for building out large amounts of additional power capacity may also present a new opportunity for

1 https://www.forbes.com/sites/salvatorebabones/2017/11/09/vietnam-is-following-in-chinas-footsteps-in-gdp-growth-at-least/#324e2d1b7c3e

2 https://www.worldbank.org/en/news/press-release/2018/06/14/vietnams-economic-prospect-improves-further-with-gdp-projected-to-expand-by-68-percent-in-2018

3 Viet Nam's Power Development Plan

4 The Socialist Republic of Vietnam. "Intended Nationally Determined Contribution." 2015. http://www4.unfccc.int/ndcregistry/PublishedDocuments/Viet%20Nam%20First/VIETNAM%27S%20INDC.pdf

5 http://www.atimes.com/the-power-of-finance-to-slow-new-coal-plants/

6 https://news.mongabay.com/2017/05/vietnam-makes-a-big-push-for-coal-while-pledging-to-curb-emissions/

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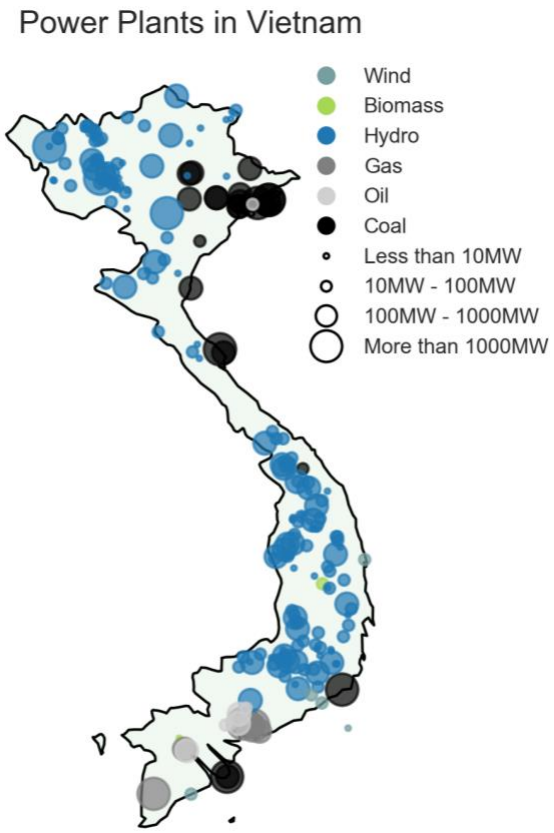
further opening up the power sector to private investment, including towards clean energy technologies. The state-owned utility, Electricity Vietnam (EVN) is heavily indebted and struggles to make a profit given electricity tariffs set by the Vietnam government that do not cover the utility's costs.[7] This situation will make it very difficult for EVN to finance new power plants on their own. The World Bank, Asia Development Bank and others are currently assisting EVN in various reforms, including by establishing competitive wholesale and retail electricity markets.[8] Private sector investment in new generation resources could offer an opportunity to help the government of Vietnam exceed their 8% below BAU provisional target for GHG reductions. There is a significant contingency of companies in Vietnam interested in making these investments in renewable energy already exists, if the enabling environment improves.



This hot topic brief introduces key policies and considerations in the Vietnam power sector, focusing on opportunities for deploying private sector capital into developing medium-scale renewable energy projects. We briefly discuss key existing policies in Vietnam, while focusing on possible new emerging approaches like business-to-business power purchase agreements (PPAs).

Market Context

In line with its power development, green growth, and climate change strategies, Vietnam has instituted a variety of policies and incentives intended to support development of the renewable energy market. Key policies include:

- The establishment of renewable energy targets within the 7th (Revised) Power Development Plan and formulation of a Renewable Energy Development Strategy (REDS).
- Tax incentives and holidays for renewable project developers.[9]

[7] https://www.esmap.org/sites/default/files/Presentations/ESMAP_KEF_2017_DAY2_Vivien%20Foster.pdf

[8] The World Bank. "Country Partnership Framework For the Socialist Republic of Vietnam for the Period FY18-FY22." 2017. Page 26. http://documents.worldbank.org/curated/en/173771496368868576/pdf/111771-PUBLIC-Vietnam-FY18-22-CPF-FINAL.pdf

[9] Decision No. 2068/QD-TTg dated 25 November 2015: https://www.mzv.cz/public/1b/a6/7a/1810646_1462225_Strategy_on_Renewable_Energy_Decision_2068_ENG_2015_11_25.pdf

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- Feed-in Tariffs (FiTs) that provide remuneration on a kilowatt-hour (kWh) basis for certain renewable energy projects that sell all generated power into the grid for at least 20 years.[10,11]

While there are several supporting policies already in place, their current implementation is often insufficient to attract investment. Take, for example, the FiT program, which provides a payment of 9.35 cents/kWh for 20 years. While this rate would be high enough to incentivize renewable projects in certain markets, Vietnam has higher financing and project development costs due to greater market risks, regulatory hurdles, and uncertain timelines. Other countries present less risk to investors, easier project development pipelines, and ultimately offer similar or higher rates of return.

Another challenge with the Vietnam FiT is that it requires use of a standardized power purchase agreement (PPA) that contains challenging provisions for the project owner. A PPA is a long-term contract between a power generator and buyer for energy, with a price per kWh that may be negotiated to increase over time. In the case of the FiT, the contract is between a private sector owner of the system and EVN. The standardized PPA used by the FiT strongly favor EVN and places added risks on the project owner.[12] The FiT also requires that projects be placed in operation by June 30, 2019,[13] offering little time for project identification and development. However, there is some indication this deadline might be extended by 6 to 18 months in some provinces.[14]

Vietnam's electric utility rates are an additional barrier to driving investment in renewable energy. In an effort to spur growth in the industrial and manufacturing sectors, Vietnam subsidizes their electricity rates. This subsidy is passed onto residential and commercial customers that pay higher rates. Because industrial customers receive a subsidized rate, it is difficult for renewable resources to compete. Thus, the business case is strongest in the commercial sector, which pays higher rates and also can likely support medium-scale projects. This results in a missed opportunity to offset significant energy demand in the industrial sector which is the most energy intensive sector and which is also seeing a lot of investment growth.

10 For rooftop solar PV systems, net metering which offers a payment for excess power generated from rooftop solar photovoltaic (PV) systems that feed power back into the grid, measured via a two-way meter. Under Vietnam's net metering structure, generation is rolled over to the next month and at the end of the year, any net excess generation is purchased by the utility.
11 Decision No. 11/2017/QD-TTg dated 4 November 2017: http://solarhub.vn/wp-content/uploads/2017/04/ENG-Matrix-of-Review-of-Vietnam-Draft-Decision-on-Solar-Power.pdf
12 Key challenges with the standard solar PPA for the FiT are summarized in this presentation: http://rainer-brohm.de/wp-content/uploads/2017/10/20170926_AHK-GIZ_Solar_web.pdf
13 https://blogs.duanemorris.com/vietnam/2018/01/02/vietnam-solar-rooftop-what-you-must-know/
14 https://www.lexology.com/library/detail.aspx?g=6757ade5-52b2-499f-b8cb-689d9ed25762

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New Approaches to Mobilizing Investment

Renewable Portfolio Standard

There are several policies on the horizon that would support renewable energy deployment, including a Renewable Portfolio Standard (RPS). An RPS requires certain entities, such as power distribution companies, to procure a set amount of renewable energy by a target year or face penalties for non-compliance. In some countries and regions, such as Mexico and Europe, private sector entities that have significant energy demand are also required to comply. While Vietnam has a decree from the Prime Minister calling for the implementation of an RPS, the exact design is still under consideration.[15]

Reverse Auctions

After the closing of the FiT program to new contracts in 2021, Vietnam intends to pilot reverse solar and wind auctions. Reverse auctions enable governments and utilities to identify the lowest price that project developers are willing to take to finance a project. Auctions are beneficial to the private sector as they provide for a long-term contracting mechanism, an important element for a known and steady revenue stream, which is important for securing project investment. Auctions have been applied in a variety of emerging country contexts, such Mexico, South Africa, and Kazakhstan and can also be a supporting procurement to other renewable energy policies, such as an RPS.

Power Purchase Agreements (PPAs)

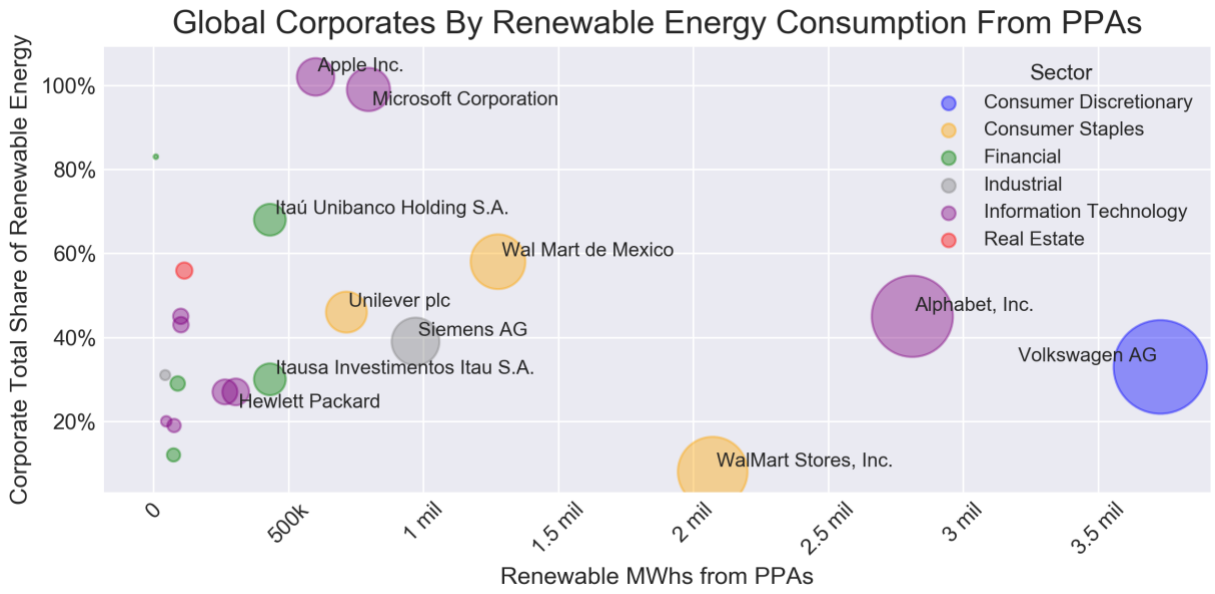
Business-to-business PPAs are another potential policy mechanism to mobilize investment. Also known as corporate PPAs or direct PPAs, these contractual mechanisms are similar to the existing structures in Vietnam that enable power purchases between a generator and the utility. Key differences are that the buyer is another private sector entity rather than the utility, and the power plant can be located off-site. Corporate PPAs provide long-term contracts with a set price per kWh, typically 15 to 25 years, and may include an annual escalator. Renewable energy PPAs may include payment for ownership of the Renewable Energy Certificates (RECs), each of which represents the benefits of 1 MWh of renewable energy generation, exclusive of the power itself. By buying the RECs along with the power, a corporate can make a claim for using renewable energy.

A key benefit of PPAs is that they offset the financing requirement from the renewable energy buyer, enabling the buyer to pay for power on a monthly basis as an operating expense, similar to how they pay their electricity bill. The buyer does not need to finance the upfront equipment and installation costs, which are significant for renewable energy projects. PPAs also enable a transfer of risk from the renewable energy buyer - which may not have much or any experience with the technologies - to developers and investors who are better equipped to take on construction and operational risks. In general PPAs provide a clear story to the public in terms

[15]https://www.mzv.cz/public/1b/a6/7a/1810646_1462225_Strategy_on_Renewable_Energy_Decision_2068_ENG_2015_11_25.pdf

of communicating a corporate impact on enabling a renewable energy generator to finance a new project. That said, an onsite PPA (discussed further below) may have additional value in terms of the physical presence of the system.

Currently, the only PPAs that are legal in Vietnam are for those projects selling power to EVN through the FiT, or as an independent power producer selling power to an EVN subsidiary generation company. This is owing to the fact that EVN is the only legal buyer of electricity in Vietnam. Corporate PPAs have been used in a variety of markets to enable private sector investment in renewable energy. For example, PPAs have been used by companies to buy renewable energy to meet their renewable energy targets in the US, Europe, China, India and many other others.[16] The figure below illustrates some of the largest corporate PPA purchasers, globally.



Power market structure has a major impact on the types of PPAs available. For example, a PPA in a vertically integrated monopoly utility, as is the case in Vietnam, will have a different structure than one in a competitive open market. PPA structures also vary by whether the project is based on the end-user's site or is offsite, and whether the power is physically delivered to the end-user or if the PPA is a financial arrangement. Offsite physical delivery of power often requires payment of a wheeling fee to the transmission and/or distribution system operator for associated costs. A summary of the key characteristics of each type of PPA is included in Table 1 below.

[16] IRENA (2018), Corporate Sourcing of Renewables: Market and Industry Trends – REmade Index 2018. International Renewable Energy Agency, Abu Dhabi.

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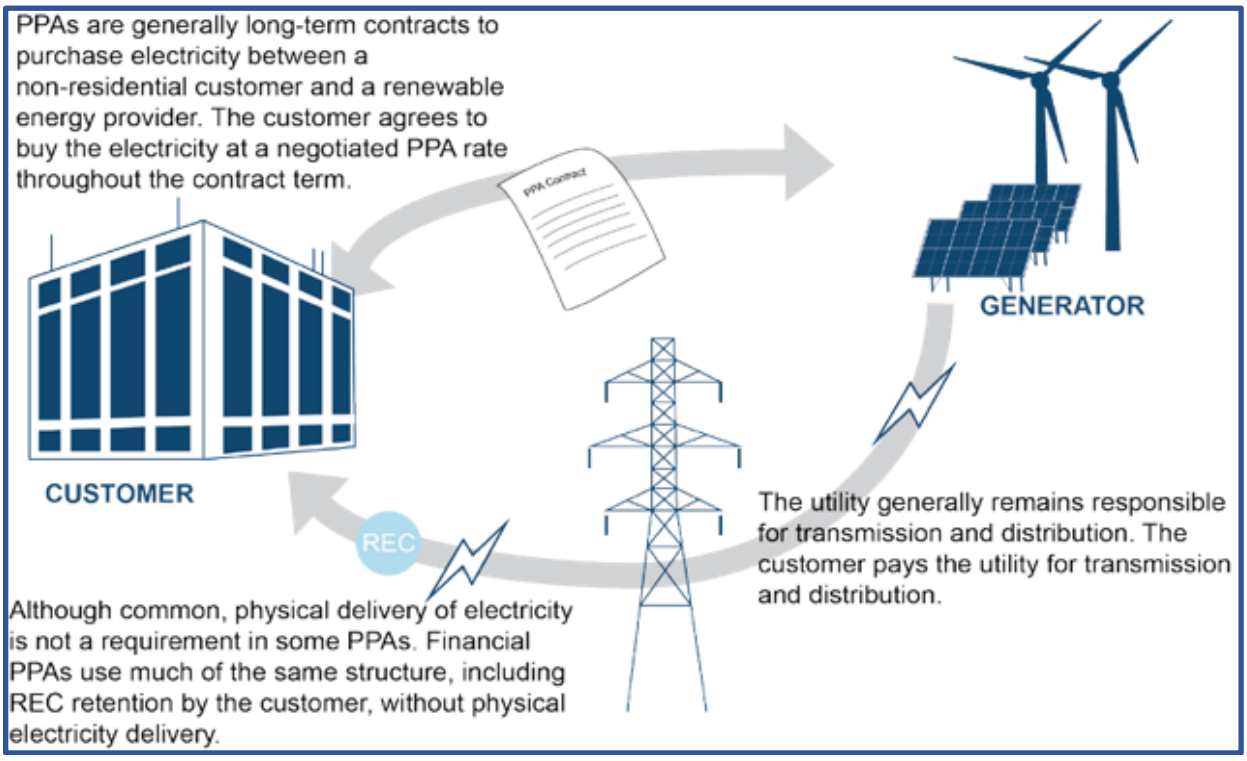
Summary of Key Characteristics of Corporate PPA Structures

	Description	Requires Onsite Roof or Land, Ideally Owned by Corporate	Physical Delivery of Power	Market Structure	Requires Wheeling Provision
Onsite PPA (aka direct PPA)	Project is located on buyer's property. The project owner is the third party developer/investor, which maintains the system and sells all power directly to the buyer.	Yes	Yes	Liberalized or Deregulated Market	No
Offsite PPA - Physical (aka Sleeved)	Project is offsite but the power is delivered into the same grid	No	Yes	Deregulated Market	Yes
Offsite PPA - Virtual (aka Synthetic or Contracts for Differences)	RE generator sells power into the wholesale market. If market price is higher than the PPA price, additional revenue goes to the RE buyer. If the price is lower, buyer makes up the difference to the RE generator.	No	No	Deregulated Market	No

A general schematic of business-to-business PPAs is shown in the figure below.



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General Schematic of Power Purchase Agreements (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)

Who are the potential corporate buyers for renewable energy? Vietnam has a robust manufacturing and industrial sector. Many of these companies are owned by or are suppliers to major multinational corporations that have made 100% renewable energy goals or other significant commitments to buy renewable energy to provide power to their commercial and manufacturing energy facilities. Examples of these companies include large beverage manufacturers like Heineken, apparel and shoe manufacturers such as Nike, Puma, and Adidas, and retail distributors like Walmart and Target. Many of these companies have also subscribed to Renewable Energy Buyers Principles under which companies seek to buy clean energy on the same grid where their factories and commercial operations are located.[17] While buying renewable energy directly is feasible in the United States, United Kingdom, and other developed markets, in less developed markets - like that of Vietnam's - the lack of enabling environments hinders companies' abilities to meet their renewable energy procurement targets.

In addition to PPAs, there are other renewable energy procurement options available to companies that represent the benefits of renewable energy generation and enable companies to make renewable energy claims, including direct investment (i.e., turnkey purchases) and buying renewable energy credits. Benefits of corporate procurement include bringing in additional foreign investment to develop and finance renewable energy projects and driving private investment towards sub sectors prioritized by the government. The benefits and challenges of corporate procurement options are summarized in the table below.

Summary of Benefits and Challenges by Procurement Type

Procurement Type	Benefits	Challenges
Direct Investments (e.g., turnkey purchase or equity in offsite project)	• For turnkey purchase, hedges against electricity price increases • Directly finances new RE projects • Offsets financing requirement of the utility to meet increasing demand • Provides a clear story to the public in terms of impact	• Requires significant capital to finance up-front costs from sources that may compete with other corporate investments • Puts more risk on the company to oversee project construction and operations
Corporate PPAs	• Hedges against electricity price increases • Provides third party financing and a power purchase that can be paid through operating expenses • Enables the private sector to establish bankable contracts that can help RE projects get financed • Offsets financing requirement of the utility to meet increasing demand • Provides a clear story to the public in terms of impact, especially for onsite solar PPAs	• Requires the right market structure and/or enabling regulations • Requires human capacity to navigate procurement options and negotiate PPAs
Unbundled	• Enables the private sector to establish	• Lacks a clear 'impacts' story to

[17] https://buyersprinciples.org

RECs	bankable contracts that can help finance RE projects	the public and may not result in additional projects

The Path Forward

Changes to the enabling environment are needed to further drive private sector investments toward new, clean energy capacity in Vietnam. This includes clarity around the expectations for electricity tariffs over the medium- to long-term, as well as adjustments to tariff rates that reflect costs and remove cross subsidies to the industrial sector. The government of Vietnam could also provide longer term certainty on the renewable energy policy front, including the types of mechanisms that will be available after the June 30, 2019 time frame, including the design of renewable energy auctions. Additionally, clear legal language that enables companies to buy power directly from renewable energy generators would allow the private sector, including major multinational companies, to meet their renewable energy targets while accessing project finance and offsetting risks. Vietnam offers a lot of potential in terms of turning itself into a regional leader on clean energy and the high-tech economy it seeks to have; it will be an important market to watch to see if leaders take on bold decisions to enable the private sector to support the government in meeting shared clean development goals.

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