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The Renewable Energy Market in Southeast Asia: A Case Study in Vietnam

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Abstract

Energy consumption levels in Vietnam have kept pace with the country's economic growth rate - growing on average 12 percent per year from 2006 to 2015. The energy demand is intensifying along with the growth of the Vietnamese population. By the end of 2015, the state-owned power corporation, Vietnam Electricity (EVN), provided electricity to 23.68 million customers – an increase of 6.2 million compared to 2010. As Vietnam's electricity demand increases, the three largest power generating sources – coal, gas, and hydropower – are being depleted. As of December 2015, renewable energy – which includes wind, biomass, and solar – only accounted for 0.4 percent of power generated in the country. These factors have become a threat to the country's energy security. To address these issues, the Vietnamese government has implemented policy changes that promote the country's renewable energy sector. For example, the 7th Power Development Plan for 2011 to 2030 calls for a stronger emphasis on and liberalization of the renewable energy market, particularly in regard to the solar energy sector. In addition, in an effort to attract capital and technology from other countries, these government sponsored programs have been open to both direct and indirect foreign investment. By examining the history of the renewable energy market in Vietnam, the government's recent policy shifts toward growing their renewable energy sector, and the growth in private sector involvement in the Vietnamese renewable energy market, this research explores the country's commitment to and engagement in the global renewable energy market.

1. Introduction

Vietnam's fast-growing economy is the primary driver for the rapidly increasing electricity demand throughout the country over the past years. The national energy consumption level has been proliferating on an average by approximately 12% per year between the year of 2000 and 2015[1]. As estimated by Vietnam's national utility, the country overall installed electricity generation capacity has almost reached 39 MW along with its annual power consumption is about 162 billion kWh in 2015[2].

The diversity of available energy sources in Vietnam ranges from coal, oil, natural gas, hydropower, and renewable energy. As noted in Table 1 and Figure 1, the 2016 Vietnam Electricity Annual Report suggests that hydropower, coal-fired power, and gas-fired power are the dominant energy sources in Vietnam. Renewable energy, including biomass, wind, and solar, is still an emerging market in Vietnam, accounting for only a minor part at 0.32 percent of the total power generation in the country collectively[3]. This has shown that Vietnam has not yet promoted the use of renewable energy for environmental protection, and sustainable socio-economic development.

Table 1. Power generation by fuel type as of December 31, 2015 (Source: EVN Annual Report 2016)

Power source	Capacity (MW)	Rate (%)
Hydropower	14,636	38%
Coal fired power	12,903	33.5%
Oil fired power	875	2.3%
Gas fired power	7,998	20.7%
Renewable	135	0.4%
Diesel and Small hydropower	2,006	5.1%
TOTAL	**38,553**	**100%**

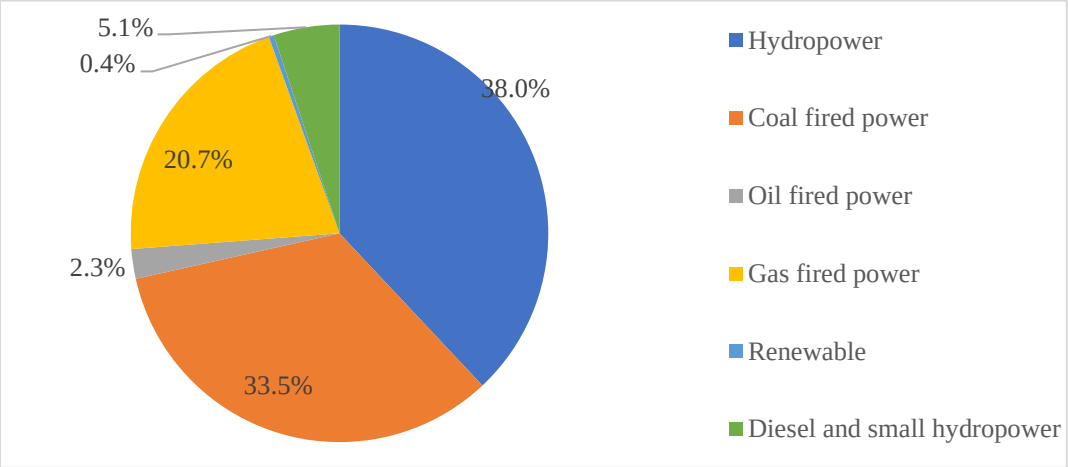

Figure 1. Power generation from national energy sources as of December 31, 2015 (Source: EVN Annual Report 2016)

2. Major Renewable Energy Policies and Incentives

Vietnam has been discussing and preparing energy efficiency and conservation laws about the strategic direction for sustainable development for the country since 2004. However, the preparation of details and regulations was delayed due to the lack of a proper studied, applied, and generalized solution for encouraging the use of clean and environmentally friendly energy. To meet the country's power demand and ensure energy security that is projected to increase by more than 10 percent annually and double the required power capacity in the next five years[4], the government of Vietnam has been moving forward to the development of reliable and clean energy sources for electricity production.

As hydropower approaches its maximum utilization, a growing reliance on coal could undermine the quality of Vietnam's economic growth. Once the Vietnamese government realized how far the country had fallen behind other nations in non-hydro renewable energy deployment and how little it was in using the non-hydro renewable power for improvement of electricity access by households in the remotest areas (off-grid, mini-grid, or grid connected community systems), the Vietnamese government has become more aware of renewable energy[5].They have been issuing many policies to encourage the development of renewable energy, set the target of using renewable energy, and direct a competitive electricity market with diversified investments and business models.

In November 2015, the Vietnamese government adopted a Renewable Energy Development Strategy (REDS) 2016-2030 with an outlook until 2050 (Decision 2068/QD-TTg), which became effective in 2016[6]. The Strategy is to guide the development and the use of renewable energy sources in the country, specifically in biomass, wind, and solar technologies. The government has set clear medium and long-term goals as well as actively encouraged and prioritized the development of renewable energy in the country's power system. Vietnam is also a signatory of the Paris Agreement and has committed to the reduction of CO_2 emissions and reliance on more expensive primary fossil sources as part of its nationally determined contributions to the country's implementation on the sustainable environmental and green economic development goals.

In March 2016, the Prime Minister approved the revision of the Power Development Plan VII (PDV VII) for 2016-2020, with a vision towards 2030 (Decision 428/QD-TTg) – a decision that was initially issued in 2011[7]. The revised plan places a stronger emphasis on the growth of renewable energy, such as speeding up the exploitation of renewable energy for electrical generation and gradually increasing the penetration of renewable energy in the power system. It also focuses on the liberalization of the power market as various foreign direct investments have the opportunity to become significant players of the policy frameworks on renewable energy. As noted in Figure 2, the Vietnamese government has laid out the goals that they aim to increase the share of renewable energy to 6.5% by 2020 (previously 4.5%), 6.9% by 2025, and 10.7% by 2030 (previously 6%)[8]. More importantly, the government's detailed plan also adds technology-specific targets for biomass and solar, in addition to already set wind goals. Regarding improving efficiency in economic and energy sectors, the PDP VII revised identifies an almost 10 percent increase in energy production that comes from the renewable sources over the next 15 years period since 2015. Furthermore, as identified in Figure 3, the government even intends to increase the power plants capacity to 60,000 MW by 2020, 96,500 MW by 2025, and 129,500 MW by 2030, respectively[9].

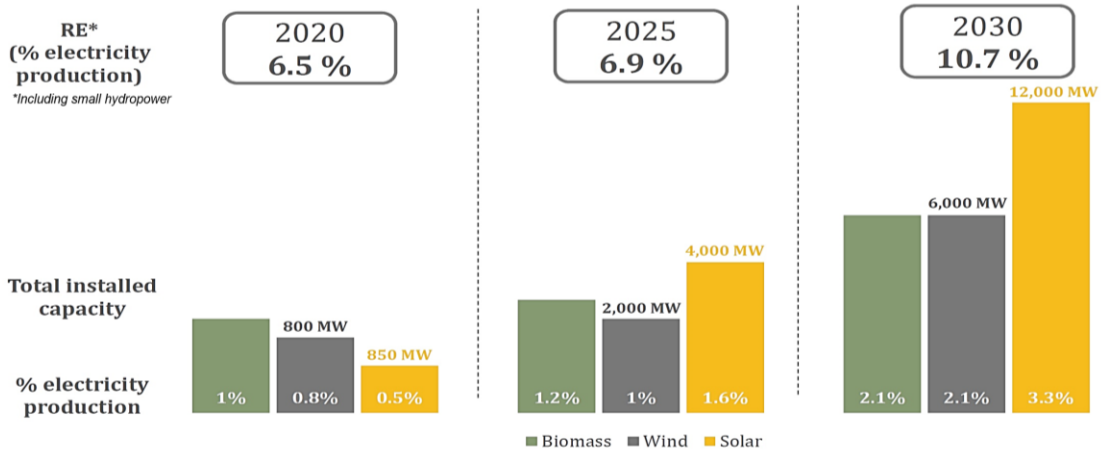

Figure 2. Renewable Targets for 2020, 2025, and 2030 (Source: PDP VII revised, Mar 2016)

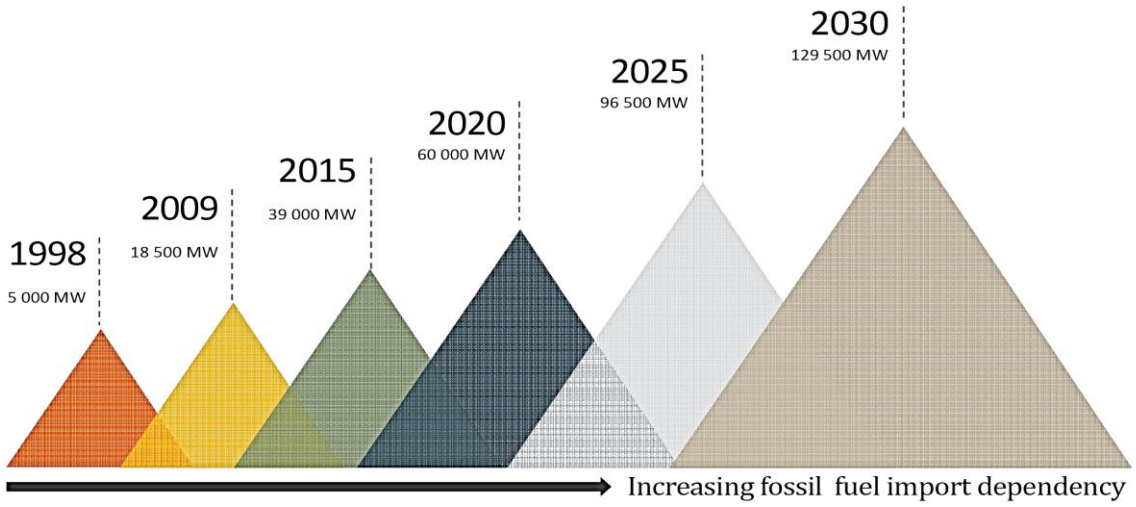

Figure 3. Installed Power Capacity – current and projected (Source: PDP VII revised, Mar 2016)

The Vietnamese government has ratified many incentives to support renewable energy. These include Feed-in-Tariffs (FiT) which are currently set for biomass, wind, solid waste-to-energy and solar projects. In 2011, the government promulgated Decision 37/2011/QD-TTg outlining incentives for wind power development, allowing

investors to receive a total VND equivalent of 7.8 US cents/kWh[10]. In 2014, the government increased the Feed-in-Tariff for renewable power generated from biomass to a VND equivalent of 7.34 US cents/kWh to 7.55 US cents/kWh[11], and from the solid waste-to-energy from a VND equivalent of 7.28 US cents/kWh to 10.05 US cents/kWh[12]. Effective June 2017, the government introduced a FiT for solar power which is the VND equivalent of 9.35 US cents/kWh[13].

3. Recent Investments

Since 2009, The German Society for International Corporation (GIZ), Germany's leading provider of international cooperation services that is wholly owned by the Federal Republic of Germany, has supported Vietnam in developing and achieving its targets on renewable energy projects since 2009[14]. GIZ cooperates with the Vietnamese Ministry of Industry and Trade (MoIT) to improve the legislative framework by the Vietnamese Prime Minister as well as to enhance the capacity of public organizations, including training activities and professional technical assistance throughout the nation. On May 8, 2017, they introduced the project called "Support to the Up-Scaling of Wind Power in Vietnam." The project is implemented with a total budget of EUR 6.9 million that is commissioned by the Federal Ministry of Economic Development and Cooperation (BMZ) under the German Climate Technology Initiative (DKTI)[15].

In May 2017, the Binh Dinh Provincial People's Committee granted an investment license to Japan's Fujiwara Corporation on the Solar and Wind Power Project with total investment capital of $63.69 million[16]. The Fujiwara Binh Dinh Solar and Wind Power Project which has a total capacity of 100MW covering a 60-hectare area. The project is 100% foreign direct investment and is developed in the western side of Phuong Mai mountain (Nhon Hoi Economic Zone). The project construction began in July 2017, and first phase is expected to be completed in early 2019 with a capacity 64MW for solar energy and an additional 36MW for wind power in the second phase beginning to be installed in early 2020[17].

The 29.7 MW Coc San Hydropower Project ran into difficulties in 2011 when the initial capital outlay for the project was expended, and the project company was unsuccessful in securing long-term debt financing. In December 2014, InfraCo Asia, an organization of the Private Infrastructure Development Group headquartered in Singapore, which also receives funding from the governments of Australia, Switzerland, and the United Kingdom, stepped in to help provide infrastructure financing[18]. The company approached to develop this run-of-river hydro scheme by providing development expertise and funding of US $7.54M, along with US$10m bridge funding. This enabled the financing and completion of a project worth US$49.9 million[19]. InfraCo Asia was initially the majority shareholder during the Coc San project's development phase. However, in February 2016, Nexif Energy, which is a Southeast Asian independent power producer with the backing of the leading global energy-focused private equity firm Denham Capital, acquired a stake in the project through the purchase of additional equity shares, allowing InfraCo Asia to step back from investing the project[20].

In late May 2017, General Electric Renewable Energy, global wind and solar company Mainstream Renewable Power, and the local Vietnamese partner the Phu Cuong Group agreed to a $2 billion USD Joint Development Agreement to develop, build, and operate the 800-MW Phu Cuong Wind Farm in the Soc Trang province of Vietnam[21]. This project is expected to be the largest wind farm in Vietnam[22].

In June 2017, Bamboo Capital Group (BCG) Bang Duong, a Vietnamese-based infrastructure investment firm, formalized plans to develop a $100 million USD solar power project in the southern province of Long An with designed capacity of 100MW with Hanwha Group[23]. In July 2017, BCG signed a cooperation agreement with Hong Kong-based firm, Unisun Energy Group, and the German company, Coara Solar, for a $40-million USD investment on a 40MW solar project in Thanh Hoa district, Long An Province, Vietnam[24].

3. Challenges

Although foreign direct investment is on the rise in the renewable energy projects in Vietnam, there are still numerous obstacles foreign investors are facing while enjoying a variety of incentives.

The first challenge for the adaption of renewable energy sources in Vietnam is the complexity of procedures for foreign ownership and investment controversy. Currently, foreign investors can own up to 100 percent of the equity in the renewable power projects, as there is no restriction of foreign ownership in the sector. The implication of land used rights in Vietnam is divided into collective land ownership by the government and can be held privately. All

properties in Vietnam are collectively owned and managed by the state, and as such neither foreigners nor Vietnamese nationals can own property. There are many outstanding legal disputes between landowners and local authorities. If the foreign companies want to implement the renewable projects, they will need to cooperate, become joint ventures or public-private partnerships in the form of Build–Operate–Transfer contracts with the landowners and local authorities because foreign investors cannot buy land. Because foreign investors cannot buy land, most projects will have to be carried out as independent power projects[25]. Therefore, the property that are used for renewable energy projects will need to be leased from Vietnamese local authorities. Besides, there are some Vietnamese land law issues that can cause severe concerns for investors. For example, under Vietnamese law, the developers are responsible for compensating local land users and paying for the construction of resettlement areas. The level of compensation is determined by agreement with the local authorities, which can be a time-consuming process. The agreement on the level of compensation is most likely to be a key condition for financial close when it comes to resettlement for land used, which this could potentially delay construction and prevent the project from meeting the 30 June 2019 deadline on the solar decision. Thus, potential investors will need to carefully consider the current use of the proposed site and potential resettlement issues[26]. For instance, a project with a cleared site, or on unsettled land or land with fewer households, may be significantly easier to develop. Hence, prospective investors need to conduct official or comprehensive site surveys, studies, or assessments when seeking investment opportunities to avoid any lawsuits regarding the legal framework.

Renewable energy projects typically involve a significant amount of capital investment and, as a result, are often financed with a substantial portion of debt capital. It is unlikely that the domestic Vietnamese banks alone will be able to provide sufficient funds to finance projects to meet the targets of the government's plans. However, international financiers are likely to face some critical challenges in participating in the financing of renewable energy projects due to the limited access to be able to work with local financial services if needed. Similar to the land-use rights issues previously discussed, foreign lenders cannot take security over land and other real property, even though they may be the most valuable assets of the mega renewable energy projects. Moreover, many issues persist that undermine a project's viability and bankability, including concerns surrounding the tariff levels, Electricity of Vietnam (EVN) as the de facto electricity buyer, the lack of government guarantees of EVN's obligations, and the lack of human resources and the advancement in technology because Vietnam has not established any professional technological research and development institute for renewable energy so far.

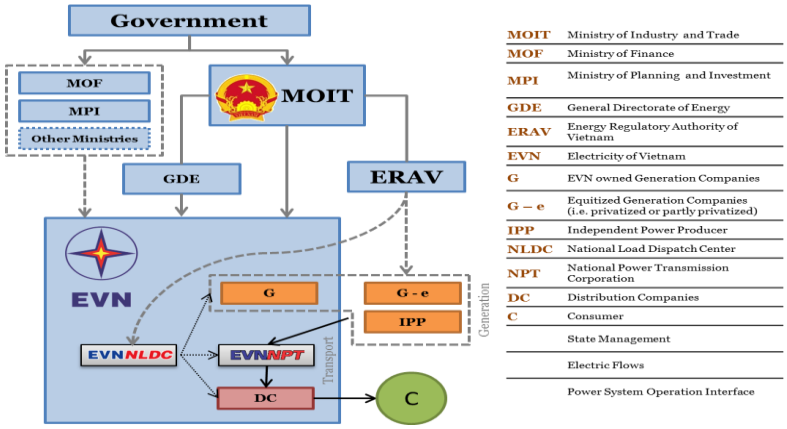

Figure 4. The Government Management Structure of Electric Power Industry (Source: GIZ Viet Nam Energy Support Programme)

As Figure 4 illustrates, there is a complex institutional structure in the electric power industry structure. At least three government agencies are directly involved in formulating or implementing renewable energy policy at a national level, with local governments and several other government agencies also having influence over either policy or its implementation. EVN is the monopoly, single-buyer of electricity which controls the electricity feed-in, transmission, and supply to consumers and operates enterprises in the utility sector. They must purchase all power generated by renewable energy projects at the FiT set by law. The FiT is set in US dollars but is denominated and payable in Vietnamese dong[27]. That also means electricity purchased by EVN will be paid for in Vietnamese dong but is linked to the Vietnamese dong – US dollar exchange rate announced by the State Bank of Vietnam, and thus, to an extent, investors will be secured from currency depreciation. However, neither the laws nor the template of power purchase

agreements includes any adjustment mechanism for inflation or rising production costs, meaning the FiT may remain unchanged during the whole investment term (other than as adjusted for FX). While the low FiT has already deterred foreign investors due to massive investment costs, negotiating standard power purchasing agreements (PPA) with EVN is also time-consuming, which leads to an increase in the total project costs. PPA negotiations must be more efficient to reduce overall costs to investors due to delays. Also, relevant government authorities should minimize timeline in the formulation of guidelines and regulatory approvals, which can take years. Lack of clarity and delays in approvals often leads to execution delays or complete abandonment of projects. Apart from general assurances provided by the Vietnamese government under the laws and decisions on renewable energy, the government does not offer specific guarantees to protect the existing incentives. For example, the government does not guarantee the changes of renewable energy once the policy frameworks they set out becoming effective, including the tariff levels, which creates uncertainty for investors. For example, it is still unclear whether the FiT for solar projects will remain the same after 30 June 2019, when the relevant regulations expire.

Lastly, there is also the challenge of lacking qualified human resources and indigenous technology in Vietnam. The lack of skilled personnel for completing renewable projects (conducting renewable resources assessments, preparing investment reports, etc.), providing essential technical and maintenance services, operating and managing post-installation of solar panels or wind turbines are also barriers for the development of renewable energy in Vietnam. Thus, there should be more effort should be made in the development of human resources, both in quantity and quality. At present, most of the equipment used for the installation of the renewable projects in Vietnam are imported from foreign suppliers[28]. This process not only leads to an increase in the project's investment costs but also takes time for importing the equipment from abroad. For these reasons, to establish and promote the development of domestic renewable energy technology, scientific research on developing, manufacturing, assembling, and repairing renewable energy-related equipment and facilities based on foreign technologies should be conducted. Furthermore, the government should establish a mechanism to encourage foreign companies to set up their manufacturing factories in Vietnam or even promote joint manufacturing projects between domestic companies and foreign ones. This way, domestic manufacturers could absorb the developed technology from advanced countries. The government can then gradually increase the investment of foreign companies to set up their manufacturing factories in Vietnam as well.

4. Conclusion

Despite the challenges that foreign investors face and barriers to entry into the market, Vietnam has immense potential for the development of renewable energy projects, especially in wind and solar. The country is well-placed and is sufficient enough to address its growing power demand due to its endowment of natural resources, geographic position, and favorable climate. The Vietnamese government is well-aware of and realizes the importance of renewable energy as related to sustainable development. With a growing demand for electricity and because the country is facing a reduction in the availability of fossil fuel resources, the Vietnamese government has developed an overarching policy framework for the renewable energy sector. The approvals of decisions in specific renewable energy sectors and revision of the Power Master Plan VII overall are a breakthrough in promoting renewable energy development, providing a legal framework for introducing investment incentives to attract foreign investors.

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