TYPES OF INVESTORS IN DEVELOPING SOLAR AND WIND POWER PROJECTS IN VIETNAM

● DO THI HIEP

ABSTRACT:

It is essential to distinguish renewable power investors to make feasible policies for renewable power development. By classifying investor types based on the ownership and the core business sector, this study's findings show that as of 2021, most renewable power investors in Vietnam come from the private sector, accounting up to 96% of the total installed solar power capacity and 99% of the total installed wind power capacity. Meanwhile, despite operating the power transmission and distribution networks and accounting for almost 38.23% of Vietnam's power supply, Vietnam Electricity (EVN) accounts only 2% and less than 1% to the total installed capacity of solar power and wind power, respectively.

Keywords: investor, renewable power, ownership, core business sector.

1. Introduction

Fighting climate change is becoming more and more urgent. The recent United Nations Climate Change Conference (COP26) has shown countries' strong commitment to mitigating climate change (UN, 2021). Vietnam's commitments at the COP26 include (1) reaching its net-zero carbon emission target by 2050, (2) phasing out coal-fueled power generation by 2040, and (3) reducing greenhouse gas emissions by 9% with domestic resources, 27% with international support by 2030 (Shira, 2021).

The energy transition in the power sector is the first area of the eight areas of focus for implementing Vietnam's COP26 commitments (Office of the Government of Vietnam, 2022). Accordingly, the draft national power development plan for 2021-2030, with a vision to 2045 (PDP VIII), is under consideration in response to the commitments (Ministry of Industry and Trade of Vietnam, 2022).

Renewable energy targets are part of Vietnam's legal basis for renewable power expansion. Vietnam aimed to bring the total solar power capacity to 850 MW in 2020, 4,000 MW in 2025, and 6,000 MW in 2030 (Prime Minister of Vietnam, 2016). However, as of 2021, the actual solar power investment reached 16,279 MW (equivalent to 19,945 MWp) (DEVI Renewable Energies, 2021a; EVN Solar, 2022), deviating far from the targeted numbers. Similarly, the targeted numbers for wind power were 800 MW by 2020, 2,000 MW by 2025, and 6,000 MW by 2030 (Prime Minister of Vietnam, 2016). However, as of 2021, 84 wind power projects were put into operation with a total installed capacity of 3,980.27 MW, surpassing the targeted number by 2025 (National Load Dispatch Center of Vietnam, 2021).

According to Do et al. (2021), the generous feed-in tariffs (Prime Minister of Vietnam, 2017, 2018, 2020) are the most important key driver for solar and wind power development (DEVI Renewable Energies, 2021b; National Load Dispatch Center of Vietnam, 2021; EVN Solar, 2022). In addition, other regulatory policies such as renewable energy

standards (RESs), renewable energy certificates (RECs), fiscal incentives such as tax incentives, investment and production tax credits, reductions in sales, energy, carbon, emission, value-added tax, financial incentives such as public investment, loans, grants, and capital subsidies have also contributed to the investment growth of solar and wind power in Vietnam (Renewable Energy Policy Network for the 21st century (REN21), 2021).

Solar and wind power investors globally are various, diverse, and heterogeneous (Climate Policy Initiative, 2016). Therefore, the energy policies should not be designed in general and similar but specific and various enough to motivate different investor groups' participation, achieving the desired structure of installed capacity by investor groups. Moreover, the past shows that little attention was put on classifying investors and studying investor behavior in Vietnam's renewable power investment market, which is the opportunity for this research. This paper aims to classify solar and wind power investors in Vietnam's market to support policy-makers in energy policy designs.

The remaining paper includes six sections. Section 2 reviews the literature regarding investor classification in solar and wind power investment markets. The method for renewable power investor classification in Vietnam is proposed and described in section 3. Section 4 illustrates and discusses the main findings. Section 5 concludes the paper with some policy implications.

2. Literature review

Traditionally, renewable power investors are distinguished based on profitability criteria (see the list of related literature in Bergek, Mignon and Sundberg (2013)) or other investment motivations (environmentalism, energy efficiency, shareholder interest) (Werner and Scholtens, 2017; Do, 2021). Recent studies suggest classifying renewable power investors based on internal factors affecting the investment process, such as ownership type and central business area (Bergek, Mignon and Sundberg, 2013; Werner and Scholtens, 2017), financial resources (equity, loans) (Kaminker and Stewart, 2015; Climate Policy Initiative, 2016; IRENA, 2016), personal characteristics (age, sex, risk propensity), and previous experience (Masini and Menichetti, 2012; Darmani, Niesten and Hekkert, 2017).

In terms of ownership, investors are distinguished between state-owned and privately-owned. State-owned investors include companies and organizations owned or controlled by municipal, regional, or national governments, while privately-owned investors use private capital resources. In addition, there are sole traders and associations (Bergek, Mignon and Sundberg, 2013). By 2015, private entities globally owned over 85% of the total installed solar and wind power capacity, while the state sector contributed less than 15% (IRENA, 2016).

Regarding central business areas, privately-owned investors can be divided into several types. Independent power plants (IPPs) specialize in electricity production. Diversified companies diversify their investment portfolio by adding electricity generation. Power project developers participate in electricity production by combining it with project development. Finance organizations and organized investors hold funds to invest in renewable power assets. End-users put their money into renewable power projects for electricity self-consumption rather than for selling it (Bergek, Mignon and Sundberg, 2013; Climate Policy Initiative, 2016).

According to Bergek, Mignon and Sundberg (2013), by July 2012, IPPs were leading players in Sweden's wind power investment market with 37%, followed by sole traders, utilities, and project developers with 17%, 15%, and 11%, respectively. For solar power, sole traders dominated with more than 50%, followed by state-owned diversified companies with 18%. In 2013, 90% of renewable power investors in Finland were utilities and project developers. Households made up 67% of solar power investment (Heiskanen et al., 2017). Investors have been interested in Germany's solar and wind power investment market to a different extent. By 2014, project developers were leading players in the wind power investment market, accounting for 67% of the total installed capacity, followed by local power companies with 15.60%. By 2016, 73% of the solar power installed capacity was owned by end-users such as households, farmers, and industrial consumers. Despite having advantages in the electric power sector, the "Big Four" – the German utilities, including RWE, EnBW, E. ON, and Vattenfall - accounted for only 5.6% of the total renewable power installed capacity (Morris, 2018).

In Vietnam, the introduction of the roadmap of

the competitive electricity market (Prime Minister of Vietnam, 2013) and the incentive mechanisms for solar and wind power investment (Prime Minister of Vietnam, 2011, 2017, 2018, 2020) have attracted various economic sectors to solar and wind power investment. According to the Electricity market development research and training center (ERAVCTED) (2022), as of 2021, the state-owned corporations (EVN, power generation corporations 1, 2, 3 (GENCO1, 2, 3), Vinacomin (TKV), and Petrovietnam (PVN)) accounted for 48% of the whole power structure. Private ownership increased its role by contributing 41%. It should be noted that ERAVCTED (2022) defines all private investors as IPPs. However, the above empirical studies indicate that private renewable power investors either entirely focus on electricity generation, come from other central business sectors, or diversify into renewable energy from construction investment. Accordingly, although they are all privately-owned, their behavior in renewable power investment market is different. Studying investor behavior for energy policy designs will be limited if all private investors are grouped together.

3. Research Methodology

Investor identification

It is crucial to define investors properly for investor classification. Masini and Menichetti (2012) consider financers for renewable power projects as investors. In contrast, Bergek, Mignon and Sundberg (2013) are interested in actors investing in renewable power production, meaning those who come up with the idea of a new plant, mobilize resources and own the plant when it is put into operation. This study uses the investor identification method suggested by Bergek, Mignon and Sundberg (2013) because this approach fully considers the investor's role throughout the project feasibility study and project development to project commissioning. It is a fact that because of lacking experience in power plant operation, investors may sell power plants to others after the plants are put into operation. Therefore, investors and power plant owners may be the same or different legal persons. In Vietnam, after commissioning, many domestic private corporations sold solar power projects to foreign corporations (Ministry of Industry and Trade of Vietnam, 2020).

In order to identify renewable power investors (here, solar and wind power investors) in Vietnam, the author collects information on operating solar and wind power plants. Due to the unavailability of a completed data set for investor identification, the data from different sources are collected and then synthesized. The information on 84 wind power plants recognized for commercial operation before November 2021 is taken from the National Load Dispatch Center of Vietnam (2021). Secondly, the lists of operating solar and wind power plants collected by DEVI Renewable Energies (2021a, 2021b) are retrieved. The information on rooftop solar power systems is collected from the EVN Solar (2022). Finally, lacking information is extracted from press releases. It is a fact that the data from the official sources is incomplete but reliable, while the data from the DEVI Renewables and press releases provide more up-to-date information but are less reliable. Therefore, the final data set is compiled on the principle of prioritizing the use of data from the official sources, if lacking, using the data from the DEVI Renewables and press releases.

The synthesized results indicate that as of 2021, Vietnam had 149 ground-mounted and floating solar power projects with 8,612 MW (equivalent to 10,364 MWp) in operation (DEVI Renewable Energies, 2021a). There are 104,294 rooftop solar power projects with a total installed capacity of 7,667 MW (equivalent to 9,581 MWp) (accessed 25/03/2022) (EVN Solar, 2022). There are 84 onshore and offshore wind power projects with a total installed capacity of 3,980.27 MW (National Load Dispatch Center of Vietnam, 2021).

Investor classification

It is a fact that the ownership type determines investment motivation and affects the accessibility to other inputs for the investment. According to Dang, Nguyen and Taghizadeh-hesary (2020), state-owned companies expect a lower profitability than private ones. Even some state-owned companies are non-profit enterprises. Electricity is one of the core sectors of the state. Because of preferential financing treatment, loan guarantees, public procurement advantage, and better information accessibility, state-owned companies achieved a higher interest rate covering ratio (earnings before tax and interest divided by interest expenses), with 9.5-12.5% compared to 5-7% for privately-owned companies over the period 2011-2016. Regarding capital structure, the debt-to-equity ratio is 2.9 for state-owned companies and 2.6 for private ones.

Diversification is a risk management strategy by diversifying the investment portfolio across various companies, industries, and asset classes. Diversified companies compare the estimated financial performance of investment options to determine the proportion of the investment portfolio to reduce financial risk. Fundamental financial performance indicators used for evaluating investment options include net present value, internal rate of return, return on investment, payback period, and interpreting financial indicators (Berger and Curry, 2021).

Thus, the ownership type and central business area significantly influence decision-making and investment processes. Therefore, this study classifies solar and wind power investors in Vietnam's market based on these two factors.

Due to the unavailability of a completed data set for the investor classification, the data from different sources are collected and then synthesized. The solar and wind power owners list is first taken from the National Load Dispatch Center of Vietnam (2022). Secondly, investors' ownership and central business area information is extracted from the National Business Registration Portal (2022) and companies' web pages. Existing solar and wind power investors in Vietnam are identified from the collected information. To sum up, the author divided investors into six groups: (1) utilities, (2) state-owned diversified companies, (3) independent power producers, (4) private diversified companies, (5) project developers, and (6) end-users. The definition and examples of investor groups are shown in Table 1. In Vietnam, many renewable power companies in Vietnam are subsidiaries. This study categorizes them according to their parent companies' ownership and central business area.

4. Research results and discussions

Energy transition in the power sector in Vietnam

In contrast to the tradition of electricity production from coal-fired and hydropower for an extended period, generating electricity from solar

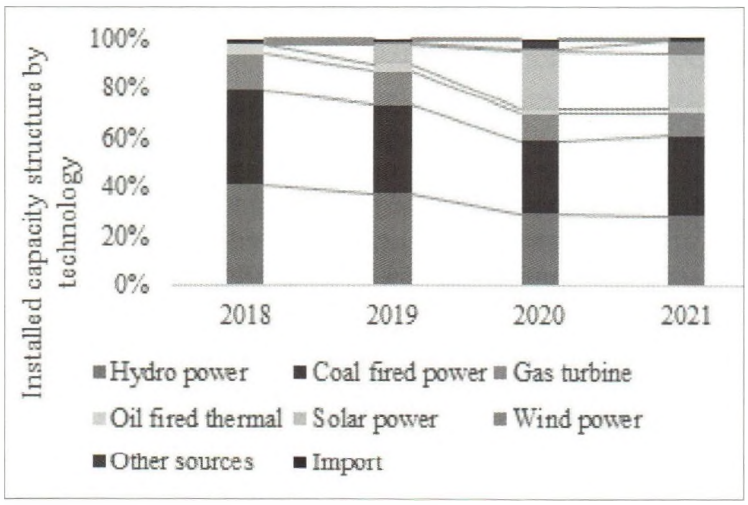
Table 1. Solar and wind power investor groups in Vietnam

Investor group	Ownership	Central business area	Example
Utilities	State-owned	A combination of electricity generation, transmission, and distribution	Power Generation Corporation 1, 2 (EVNGENCO1, 2), Power Construction Consulting 2 JSC (EVNPECC2), Central Power Corporation (EVNCPC), Power Project Management Board 2, 3 (EVNPMB2, 3)
State-owned diversified companies	State-owned	Another business area than electricity generation	Construction and Infrastructure Development Corporation 13, 16 (LICOGI 13, 16), Trading Construction JSC (Vietracimex)
Independent power producers	Privately-owned	Electricity generation	Ea Sup 1,2,3,4,5 JSCs, Loc Ninh Energy JSC, Ninh Thuan Energy Industry JSC
Privately-owned diversified companies	Privately-owned	Another business area than electricity generation	Gia Lai electricity JSC/Thanh Thanh Cong group, Bac Phuong JSC, BIM group, Tai Tien LTD, Ha Do group, BCG, Trung Nam group
Project developers	Privately-owned	Plan, build, and initially operate power plants for other owners	Dai Hai Investment and Development JSC, Truong Thanh Investment Construction and Development JSC, Song Lam Son La Energy JSC
End-users	Privately-owned	Another business area than electricity generation; The generated electricity is for self-consumption rather than for selling it.	Households, industrial units, commercial units

and wind energy has only received attention in recent years. Vietnam's first wind power project was implemented in 2011. In 2018, the first grid-connected solar power plant was put into operation.

Although starting late, solar and wind power sources have penetrated quickly and intensely into Vietnam's power supply. As of 2021, the total installed capacity of Vietnam reached 76,620 MW, becoming the leading country in power system scale in the Association of Southeast Asian Nations (ASEAN) for the first time. Coal-fired and hydropower still accounted for a large proportion (60%) of the installed capacity structure but decreased by 20% compared to the number in 2018. In contrast, the share of solar and wind power sources increased seven times from only 0.73% in 2018 to 27% in 2021 (Figure 1).

Figure 1. Installed capacity structure by technology in Vietnam between 2018 and 2021



(Data source: Prime Minister of Vietnam, 2021; ERAVCTED, 2022)

Investor types

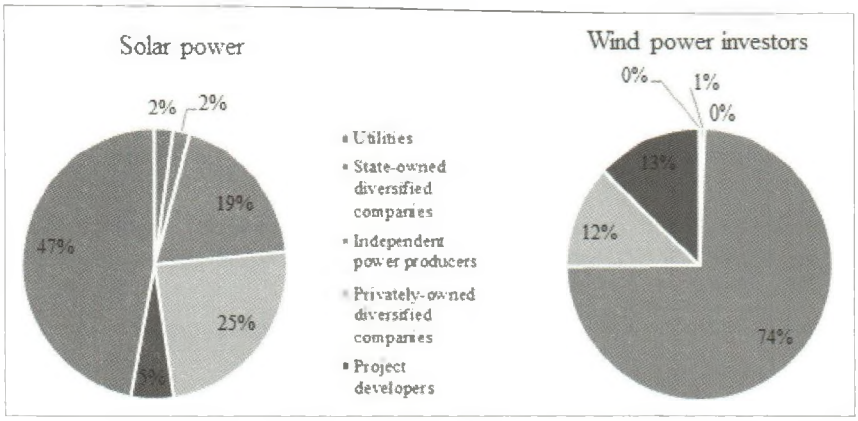
As shown in Figure 2, by 2021, privately-owned investors dominated Vietnam's renewable power investment market, accounting for 96% and 99% of the total installed capacity of solar and wind power, respectively. Of which, end-users took advantage of rooftop or space ownership to contribute around 47% to the total solar power installed capacity, followed by privately-owned diversified companies and IPPs with 25% and 19%, respectively. IPPs made up 74% of the total wind power installed capacity, followed by privately-owned diversified companies with 12%. Surprisingly, despite owning the power transmission and distribution networks, having advantages in the power investment process, and accounting for 38.23% of the total power supply (ERAVCTED, 2022), the utilities - EVN's subsidiaries contributed only 2% and less than 1% to the total installed capacity of solar power and wind power, respectively. The state-owned companies contributed only 2% to the total solar power installed capacity.

When it comes to project scale, it is surprising that the average size of solar power investment projects did not vary significantly among investor types, with a range from 40 to 66 MW. The average project scale is from 43 to 48 MW for wind power. EVN invested in one of the first wind power projects in Vietnam (the Phu Lac project) with an installed capacity of 24 MW.

Because of the insignificant difference in project scale among investor groups, shares of a total number of projects are proportional to the shares of total installed capacity. Specifically, a substantial proportion of the ground-mounted and floating solar power projects were invested by privately-owned diversified companies with 44.30% (66 projects) and IPPs with 32.21% (48 projects). Project developers contributed 14.09% (21 projects) to the total number of ground-mounted and floating projects. For wind power, 71.76% (61 projects) are invested by IPPs. Project developers and privately-owned diversified companies contributed 14.12% (12 projects) and 12.94% (11 projects).

Vietnam's renewable power investment markets have also been attractive to international investors, apart from national investors. Findings indicate that by 2021, around 10% and 3.5% of the total installed capacity of solar and wind power was invested by international investors or joint ventures by national and international investors. For solar power, some known international investors are B.Grimm Power Public Company Limited (Thailand), Quadran International Group (France), Pacific Energy Network (the USA), Dohwa Green Energy Ltd (South Korea), and Sinenergy Holdings

Figure 2. Installed capacity structures of solar power, wind power by investor group in Vietnam by 2021



(Data source: processed by the author)

(Singapore). EAB New Energy Gmbh (Germany), the Blue Circle PTE LTD, and TSV Invest and Development (Singapore) must be mentioned for wind power.

Looking deeply into the central business area of diversified companies, the author found that companies diversifying into solar power investment come from different central business areas, such as real estate, agriculture, tourism, building materials, commercial, services, and infrastructure. Wind power investment has received the investment flow of companies with real estate, trading, tourism, and electric equipment as the central business areas. Up to now, many of these companies have considered renewable power investment as the central business area.

5. Conclusion and Policy Implications

This study has added empirical evidence for investors' diversity and heterogeneity. Due to the difference in ownership and central business area, the investors in Vietnam's solar and wind power investment market are classified into six groups: utilities, state-owned diversified companies, independent power producers, privately-owned diversified companies, project developers, and end-users.

The energy transition in the power supply structure from the dominance of coal-fired and hydropower to the emergence of solar and wind power in Vietnam has received a significant and vital contribution from private investors. Privately-owned investors have accounted for more than 95% of the total installed capacity and the total number of solar and wind power plants. Another conclusion is that the investment of privately-owned investors is different between solar and wind power. End-users and privately-owned diversified companies have made most solar power investments, while wind power investment projects have attracted IPPs.

Because of using the secondary data, this paper does not fully provide a comprehensive understanding of solar and wind power investors in Vietnam's market. It is suggested that further studies will survey investors to have primary data set to explain investor behavior more clearly.

Despite the above limitation, this paper provides a good reference for policy-makers and researchers for designing energy policies and conducting relevant studies. Different investor groups are affected significantly differently by the same energy policy due to the difference in investment motivations, accessibility to land, finance, and information. Therefore, it is recommended that the energy policies be designed regarding investor types ■

REFERENCES :

1. Bergek, A., Mignon, I. and Sundberg, G. (2013). Who invests in renewable electricity production? Empirical evidence and suggestions for further research, *Energy Policy*. Elsevier, 56, pp. 568–581. doi: 10.1016/j.enpol.2013.01.038.

2. Berger, R. and Curry, B. (2021). What Is Diversification?, Forbes Advisor. Available at: *https://www.forbes.com/advisor/investing/what-is-diversification/* .

3. Climate Policy Initiative (2016). *Policy and investment in German renewable energy*, (April), p. 84.

4. Dang, L. N., Nguyen, D. D. and Taghizadeh-hesary, F. (2020). *State-owned enterprise reform in Vietnam: progress and challenges.*

5. Darmani, A., Niesten, E. M. M. I. and Hekkert, M. P. (2017). Characteristics of investors in onshore wind power in Sweden, *Environmental Innovation and Societal Transitions*, 24, pp. 67-82. doi: 10.1016/j.eist.2016.10.005.

6. DEVI Renewable Energies (2021a). List of solar projects in Vietnam - Google Sheets. Available at: *https://docs.google.com/spreadsheets/d/1SYraolsm8s_23xyfVf-7bHzlblDHEMa_T_HMZyRdJUQ/edit#gid=182466376.*

7. DEVI Renewable Energies (2021b). List of wind projects in Vietnam - Google Sheets. Available at: *https://docs.google.com/spreadsheets/d/1hQNS0W-EDO5DDw6TppV7pyYdyagCDmHuASHHZBxQHxo/edit#gid=182466376.*

8. Do, T. H. (2021). *Development of Feedback Control for Energy Policy Design to Guarantee Sustainable Solar and Wind Power Investment Growth.*

9. Do, T. N. et al. (2021). Vietnam's solar and wind power success: Policy implications for the other ASEAN countries, *Energy for Sustainable Development*, 65, pp. 1-11. doi: 10.1016/j.esd.2021.09.002.

10. Electricity market development research and training center (ERAVCTED) (2022). Current status and development orientation of Vietnam electricity industry, *in Vietnam competitive electricity market.*

11. EVN Solar (2022). Rooftop solar power systems in Vietnam, EVN Solar. Available at: *https://solar.evn.com.vn/#/.*

12. Heiskanen, E. et al. (2017). Small streams, diverse sources: Who invests in renewable energy in Finland during the financial downturn?, *Energy Policy*. Elsevier Ltd, 106 (February 2016), pp. 191-200. doi: 10.1016/j.enpol.2017.03.013.

13. IRENA (2016). *Unlocking Renewable Energy Investment: The Role of Risk Mitigation and Structured Finance.*

14. Kaminker, C. and Stewart, F. (2015). The Role of Institutional Investors in Corporate Financing', *Financing and Raising Capital*, (23). doi: 10.5040/9781472920386.ch-022.

15. Masini, A. and Menichetti, E. (2012). The impact of behavioural factors in the renewable energy investment decision making process: Conceptual framework and empirical findings, *Energy Policy. Elsevier*, 40(1), pp. 28–38. doi: 10.1016/j.enpol.2010.06.062.

16. Ministry of Industry and Trade of Vietnam (2020). Transferring solar power projects is a normal business activity in the market mechanism. Available at: *https://moit.gov.vn/phat-trien-ben-vung/chuye-n-nhuo-ng-ca-c-du-a-n-die-n-ma-t-tro-i-la-mo-t-hoa-t-d.html* .

17. Ministry of Industry and Trade of Vietnam (2022). *Draft report on the completion of the National Power Developent Planning for the period 2021-2030, with a vision to 2030.*

18. Morris, C. (2018) Share of German citizen renewable energy shrinking, Energy Transition. Available at: *https://energytransition.org/2018/02/share-of-german-citizen-renewable-energy-shrinking/* (Accessed: 10 May 2021).

19. National Business Registration Portal (2022). Business Information. Available at: *https://dangkykinhdoanh.gov.vn/en/Pages/default.aspx* .

20. National Load Dispatch Center of Vietnam (2021). *COD status of wind power plants* (updated to 31/12/2021).

21. National Load Dispatch Center of Vietnam (2022). *Renewable power companies.*

22. Office of the Government of Vietnam (2022) Notice 30/TB-VPCP 2022 on implementation of UN commitments on climate change. Available at: *https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Thong-bao-30-TB-VPCP-2022-thuc-hien-cam-ket-Lien-hop-quoc-ve-bien-doi-khi-hau-502177.aspx* .

23. Prime Minister of Vietnam (2011). *Decision 37/2011/QD-TTg on the mechanisms to encourage the development of wind power projects in Vietnam.*

24. Prime Minister of Vietnam (2013). *Decision 63/2013/QD-TTg, Regulations on the roadmap, conditions, and power structure for formulation and development of levels of the electricity market in Vietnam.*

25. Prime Minister of Vietnam (2016) *Decision 428/QD-TTg on the Approval of the revised National Power Development Plan for the period from 2011 to 2020, with a vision to 2030.*

26. Prime Minister of Vietnam (2017) *Decision 11/2017/QD-TTG on the mechanisms to encourage the development of solar power projects in Vietnam.*

27. Prime Minister of Vietnam (2018) *Decision 39/2018/QD-TTg on the compensation regulation of the mechanisms to encourage the development of wind power projects in Vietnam.*

28. Prime Minister of Vietnam (2020) *Decision 13/2020/QD-TTg on Support Mechanisms for Solar Power in Vietnam.*

29. Prime Minister of Vietnam (2021) *The draft of Decision on Approving the national electricity development plan for the period of 2021-2030, with a vision to 2045.*

30. Renewable Energy Policy Network for the 21st century (REN21) (2021) Renewables 2021 Global Status Report, REN21. Available at: *https://www.ren21.net/wp-content/uploads/2019/05/ gsr_2020_full_report_ en.pdf% 0A http://www.ren21.net/resources/publications/.*

31. Shira, D. (2021) COP26 and Climate Change: Vietnam's Commitment to Reducing Emissions, Vietnam Briefing. Available at: *https://www.vietnam-briefing.com/news/cop26-climate-change-vietnams-commitment-reducing-emissions.html/*

32. UN. (2021). COP26: Together for our planet, Climate Action. Available at: *https://www.un.org/en/climatechange/cop26*.

33. Werner, L. and Scholtens, B. (2017). Firm Type, Feed-in Tariff, and Wind Energy Investment in Germany: An Investigation of Decision-Making Factors of Energy Producers Regarding Investing in Wind Energy Capacity. *Journal of Industrial Ecology,* 21(2), pp. 402-411. doi: 10.1111/jiec.12443.

Received date: June 2, 2022
Reviewed date: June 18, 2022
Accepted date: June 27, 2022

Author's information:
Dr.-Ing. DO THI HIEP
Electric Power University

PHÂN LOẠI NHÀ ĐẦU TƯ TRONG PHÁT TRIỂN CÁC DỰ ÁN ĐIỆN MẶT TRỜI VÀ ĐIỆN GIÓ TẠI VIỆT NAM

● TS. **ĐỖ THỊ HIỆP**
Đại học Điện lực

TÓM TẮT:

Phân biệt được các nhà đầu tư điện tái tạo là vô cùng cần thiết để thiết kế chính sách phù hợp cho phát triển năng lượng tái tạo. Bằng cách phân loại nhà đầu tư dựa vào tính sở hữu và lĩnh vực kinh doanh chính, kết quả nghiên cứu cho thấy hầu hết nhà đầu tư điện mặt trời và điện gió ở Việt Nam hiện nay là các nhà đầu tư tư nhân, họ đóng góp 96% công suất lắp đặt điện mặt trời, 99% công suất lắp đặt điện gió. Trái lại, mặc dù sở hữu hệ thống truyền tải và phân phối điện, đóng góp đến 38.23% tổng cung nguồn điện Việt Nam, Tập đoàn Điện lực Việt Nam chỉ đóng góp 2% và nhỏ hơn 1% vào tổng công suất lắp đặt điện mặt trời và điện gió.

Từ khóa: nhà đầu tư, điện tái tạo, tính sở hữu, lĩnh vực kinh doanh chính.