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Research Potential And Outlook For Renewal Energy Development In Vietnam

Vu Ngoc LUAN*[1] , Dao Hong VAN[2] , Nguyen Duc DUONG[3]

[1]*Thuyloi University; email luanvn@tlu.edu.vn*
[2]*International Training and Cooperation Institute, East Asia University of Technology, Hanoi, Vietnam.*
[3]*Faculty of Natural and Environmental Economics, Hanoi University of Natural Resources and Environment, Hanoi, Vietnam.*

Summary

Energy supply to meet the needs of socio-economic development is and will face many problems and challenges, especially the gradual depletion of domestic fossil fuel resources, volatile oil prices, as well as such as the impacts of climate change on security and safety in energy supply... Therefore, gradually diversifying energy supply, power source based on renewable energy sources that Vietnam has potential , especially biomass, wind, and solar energy sources... are considered as one of the solutions for sustainable development. In recent years, Vietnam is one of the dynamic developing economies, with a relatively high development rate compared to other countries in the region and the world. The energy sector plays a key role in promoting the country's socio-economic development. However, the energy development process has revealed weaknesses and inadequacies in the supply and use of energy, especially inefficient and wasteful use of electricity.

Keywords: Potential, prospect, renewable energy.

Question

In recent years, the demand for electricity for production and socio-economic development has been increasing, which is a great challenge for the electricity industry in the context of primary energy supply such as coal, oil and gas… are increasingly depleted, not enough to meet demand. Therefore, the shift from exploiting traditional energy sources to developing renewable energy (renewable energy) is a common development trend not only in Vietnam but also around the world. Below are the key points in the overall picture of the energy industry as well as the potential of renewable energy in Vietnam. Although renewable energy brings many benefits, it actively contributes to minimizing impacts on the environment and climate change; contribute to ensuring energy security; socio-economic development of the country; jobs; improve the qualifications of domestic workers. However, the development of renewable energy currently faces many difficulties in terms of policy, financial and technical mechanisms. To solve these problems, it is necessary to drastically implement synchronous solutions from state management agencies and businesses.

1. Current status of Vietnam's energy industry

Although assessed as having great potential in terms of renewable energy sources (renewable energy), the development of renewable energy projects in Vietnam is still not commensurate with the potential.

Up to this point, the whole country has only developed small hydropower (small hydroelectricity) mainly (as of 2015, the total small hydroelectric capacity is about 2,300 MW), while wind and solar power sources have been developed. , biomass is insignificant (currently there are only 159 MW of wind power and some biomass power generation units at sugar factories). The main reason for

the underdevelopment of renewable energy projects in recent years is that according to previous regulations, the purchase price of electricity from these projects is still low and not attractive to investors.

Since the Government's new regulation on the purchase price of renewable energy, in which solar power is 9.35 cents/kWh, especially the new regulation on onshore wind power price is 8.5 cents/kWh and at sea is 9.8cent/kWh, the number of solar and wind power projects increases significantly. According to information from the Ministry of Industry and Trade, by the end of 2018, there were more than 11,000 MW of solar power registered for investment.

Policy mechanism for renewable energy development

Renewable energy development is a major policy of the Party and State, which has been concretized in the Politburo's Resolution 55 to the Prime Minister's Decisions approving the Renewable Energy Development Strategy and the Government's Decision No. mechanisms to encourage the development of renewable energy projects.

Renewable energy development goals in Vietnam's renewable energy development strategy for the period to 2030 with a vision to 2050, approved by the Prime Minister in Decision No. 2068/QDTTg dated November 25th/ In 2015, the share of electricity produced from renewable energy (including large and small hydroelectricity) in the total electricity production of the country should reach 32% by 2030 and 43% by 2050. In the Power Master Plan VII. adjusted , it is expected that renewable energy power sources (including small hydro, wind power, solar power, and biomass power) will account for 21% of the country's total power capacity by 2030. And in the Decree Decision 55-NQ/TW dated February 11, 2020 of the Politburo stipulates that the proportion of renewable energy sources in the total primary energy supply will reach 15-20% in 2030 and 25-30% in 2045, equivalent to The proportion of renewable energy in total electricity production nationwide is about 30% in 2030 and 40% in 2045.

In order to achieve the above-mentioned renewable energy targets, the Ministry of Industry and Trade has advised the Government of Vietnam to issue various incentive mechanisms for renewable energy power types that are assessed to have great potential.

Table 3: Summary of incentive mechanisms for renewable electricity development

Type of renewable energy	Type of technology	Incentive and Effective Mechanism	Price (not including VAT)
Small hydroelectricity (under 30MW)	Power production	Avoidable cost tariff	The electricity price list is announced annually by the Ministry of Information and Communications
Wind power (for projects put into operation before November 2021)	Project on land	FIT for 20 years	8.5 USCents/kWh
	Offshore project	FIT for 20 years	9.8 USCents/kWh
Biomass	Co-generation of heat-electricity	FIT for 20 years	7.03 USCents/kWh
	Not Co-generation of heat-electricity	FIT for 20 years	8.47 USCents/kWh
Electricity from waste	Burn	FIT for 20 years	10.05 USCents/kWh

Type of renewable energy	Type of technology	Incentive and Effective Mechanism	Price (not including VAT)
	Bury	FIT for 20 years	7.28 USCents/kWh
Solar power	Floating solar power	FIT for 20 years	7.69 USCents/kWh
	Ground solar power	FIT for 20 years	7.09 USCents/kWh
	Rooftop solar power	FIT for 20 years	8.38 USCents/kWh

Source: Report of the National Steering Committee on Electricity Development

In addition to the incentive mechanisms on electricity purchase prices mentioned above, renewable energy projects in Vietnam can also enjoy other support mechanisms such as incentives for corporate income tax, equipment import tax, preferential land use and access to finance....

Table 4: Other incentive mechanisms for grid-connected renewable power projects.

STT	Financial incentive mechanism	Level
first	CIT	CIT rate: - The first 4 years from the year of taxable income: 0% - Next 9 years: 5% - Next 2 years: 10% - The remaining years: 20%
2	Import Tax	Goods imported as fixed assets, materials and semi-finished products are not produced domestically. Investors should check the annual List of goods and products exempt from import tax published by the MPI.
3	Using land	Preferential land rental according to the regulations of the Province
4	Environmental protection fee	0%
5	Invest	Vietnam Development Bank (VDB) lends up to 70% of total investment costs at an interest rate equivalent to that of 5-year Government bonds plus 1%/year

Source: Report of the National Steering Committee on Electricity Development

2. Difficulties and obstacles in renewable energy development

Here are the difficulties and obstacles for renewable energy development in recent times

2.1. About mechanism and policy

- The price of electricity from renewable energy sources is currently higher than that of electricity from traditional energy sources (thermal power, large hydropower...). Electricity of Vietnam (EVN) is being assigned by the state to purchase all electricity output from renewable energy power projects at a

price set by the state. Thus, EVN is performing the function of replacing the state, the compensation cost for renewable energy is being combined with the cost of the electricity industry, not clearly separated in the electricity bill. When the proportion of renewable energy increases, the price compensating component will increase and greatly affect the cost of electricity industry.

- The renewable energy market needs clear policies and legal procedures to increase investor interest. The support mechanisms in the past time have not given a long-term orientation: From the beginning of 2021 until now, solar power projects are not allowed to apply the FIT tariff, while the bidding mechanism has not been issued. Similarly, wind power projects after November 1, 2021 also do not have an application mechanism.
- The support price (FIT) is applied uniformly throughout the country, leading to the phenomenon of concentrated development in areas with great economic potential (high solar power radiation, high average wind speed), the As a result, it is overloading the power grid in some areas or investing in places with low electricity demand, having to load electricity far away. To overcome this drawback, it is necessary to have policies to encourage development by region and region.
- Lack of standards and regulations of renewable energy projects: Standards and certificates are needed to ensure that equipment manufactured or procured from abroad is consistent with current standards. The promulgation of standards is necessary to ensure that the enterprises operating the plants are in compliance with applicable laws. The lack of necessary standards also causes confusion and renewable energy producers face unnecessary difficulties.

2.2. Regarding financial arrangements:

Investing in renewable energy projects with large capital requirements, high risks because capacity and output are dependent on weather and climate, long payback due to higher investment rates and electricity prices than energy sources. traditional quantity. Therefore, financial institutions and commercial banks are often not ready to lend to investment projects in the field of renewable energy.

2.3. Technically:

Issues related to the integration of renewable energy sources into the power system

The production of electricity from renewable energy sources (wind, solar or ocean waves…) these types of sources of electricity generation is intermittent and unstable, so their integration with power systems faces challenges. like:

- Power quality is an important factor in the power system to ensure the stability and high efficiency of the grid system, creating high reliability and low cost.
- The availability of electricity is one of the biggest concerns in integrating renewable energy sources with power systems: Solar power does not generate electricity at night, and wind power depends on the speed of electricity. wind.
- Overall forecasting: In power systems forecasting is a key topic of the energy management system for grid development planning to ensure stability and high reliability, because As most renewable energy technologies depend on weather and environmental factors, forecasting power generation is difficult to be accurate.
- Location of renewable energy sources: Most large-scale renewable energy power plants usually occupy land with a considerable area (solar power accounts for about 1.2ha/1 MWp, wind power accounts for 0). ,35 ha/1 MW). Choosing a location to build a renewable energy power plant will entail many factors affecting its integration into the grid. For example, if the location of a renewable energy plant is far from the grid, it affects the cost and efficiency of project operation. The ability of renewable energy sources to generate electricity is also highly dependent on the weather and climate at the location where the renewable energy source is built.
- The issue of cost and economic estimation is an important part of the planning to integrate

renewable energy sources - the power grid because it must ensure the lowest possible cost ratio. The two main goals of renewable energy project development are economic and environmental. To integrate a large amount of capacity from renewable energy sources, consider installing energy storage devices. However, the storage system has a high cost, and this is really an economic challenge when integrating renewable energy sources – large-scale grids.

Impacts of solar power (DMT), wind power (EIA) on the power system

It can be seen that, with the characteristics of rapid, uncontrolled and uncontrolled change in power generation capacity (power), solar and wind power will cause significant fluctuations to the power system whenever solar radiation and wind change. bias, or stop. If other power sources are not invested to replace at that time, or the existing power sources are not adjusted to increase (or decrease) capacity in time to compensate - offset while EIA and Solar Power are involved. , the power system will unbalance the power supply and load consumption. At that time, the voltage and frequency of the power system will slip out of the allowable rated index and the technical protection systems will operate, with serious consequences that may disintegrate the grid, and lose power on a large scale.

Thus, it is necessary to have another backup power source to mobilize when wind and solar power changes rapidly, or suddenly stops. Thus, to ensure the safe operation of the power system, without voltage and frequency drops, it is necessary to have an available capacity nearly equivalent to the total capacity of participating solar and power sources.

On the other hand, in order to be able to actively control alternative power sources, or control the main sources of solar power and assessment when there is abnormality, the power system operator needs to have measures, tools, and accurate forecasting capacity. change of wind speed, increase and decrease of solar radiation during the day, during the week... even if there is enough backup power.

Another point of concern is that solar power sources with inverters, or turbines of the power supply or generating harmonics close to the natural frequency of the power system can cause sustained resonance on the power system. , adversely affecting the power system as well as damaging the solar and power plants themselves.

Measures to prevent bad and harmful impacts on the power system and promote the development of solar and wind power sources

It is necessary to equip the capacity to forecast changes in solar power capacity in the short term, based on the laws of variation and forecast of meteorology, hydrology, weather and operating characteristics of renewable energy sources at the time. forecast to actively mobilize other sources to replace and support. According to the recommendation of the EGI International Consultant, it is necessary to build a monitoring and control center for renewable energy sources (at the National Load Dispatch Center and lower-level dispatching centers); retrofit power quality monitoring software; invest in data collection and forecasting systems for renewable energy sources.

The power system needs to be invested in additional backup sources so that in addition to power generation operation, there is also a rotating reserve capacity (hot standby) to quickly mobilize the source - load balance in the time of energy fluctuations. regenerative.

The power transmission and distribution industry needs to invest in upgrading the smart grid, on the one hand to increase the ability to absorb and transmit renewable energy sources, and on the other hand to be able to respond to fluctuations in solar capacity. , DG.

Solutions to develop renewable energy in Vietnam

In Vietnam, recognizing the potential and role of renewable energy in economic development as well as environmental protection, the Government affirmed: “Renewable energy development is not only focused on expanding the scale. and increasing the proportion of renewable energy sources in the total primary energy supply, contributing to ensuring energy

security, but also solving the problem of energy supply for rural areas, contributing to promoting the development of agricultural products. produce and build a society that uses resources economically and efficiently, and is friendly to the environment ". In which, the goal set out in the Power Plan VII is to bring the total wind power capacity from 140 MW at present to about 800 MW by 2020, equivalent to about 0.8% of the total power capacity; develop electricity using biomass energy from sugar factories, food and food processing, solid waste, etc., accounting for about 1% of total power capacity by 2020 and 1.2% by 2025; the total capacity of solar power sources from the current negligible level to about 850 MW by 2020; about 4,000 MW in 2025 and about 12,000 MW in 2030 with respective proportions of 0.5%, 1.6% and 3.3% of total power capacity. Therefore, it is necessary to have breakthrough solutions to turn potentials and goals into reality.

(i) Promulgating a common legal framework for renewable energy development: According to the experience of successful countries in renewable energy development such as Germany, China, India and European-American countries, it is necessary to issue The Renewable Energy Law aims to create favorable and stable conditions on the legal basis and policy for renewable energy development, focusing on sustainable coordinated policies at the national and territorial level to expand the market. renewable energy field; promoting and deploying new technologies; encourage the use of renewable energy in all important sectors of the energy market.

(ii) At present, electricity prices in Vietnam are not yet under the market mechanism, so electricity prices generated from renewable energy cannot compete with traditional electricity prices formed from fossil energy. Therefore, the key issue is to develop and issue an appropriate electricity tariff for both wind power, solar power, and electricity formed from other forms of renewable energy, harmonizing the interests of all three parties. are: Investor (power seller), EVN (power buyer) and the Government's goal of developing green power sources - zero greenhouse gas emissions. In addition, it is necessary to develop a roadmap for correct calculation, sufficient calculation, and elimination of subsidies for electricity generated from fossil fuels in order to promote transparency and fair competition in the electricity trading market.

(iii) Develop strategies and plans for renewable energy development in the short, medium and long term with specific targets for each stage of economic development. In particular, the early promulgation of national and local renewable energy development plans will help reduce the time for investors to research, deploy and complete project documents.

(iv) Study the feasibility of establishing a Sustainable Energy Development Fund using capital from the state budget, revenue from environmental fees for fossil fuels, funding sources, contributions from organizations and individuals at home and abroad ... in order to provide financial support for renewable energy projects, and to support the community to develop models of using renewable energy.

(v) Promulgating policies to attract businesses to participate in the renewable energy market, in which, in addition to preferential policies on tax, credit, land, price mechanism, electricity trading mechanism ... for enterprises investing in renewable energy projects, it is necessary to supplement policies to encourage investment in development and production of power generating machines and equipment... serving renewable energy projects as incentives. on tax, on preferential loans for enterprises that manufacture, assemble and repair equipment such as water heaters, small hydroelectricity, wind engines, biogas biogas tunnels, etc.

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