



Current Situations and Solutions for Renewable Energy Development in Vietnam

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Abstract— The development potential for renewable energy in Vietnam is very huge and divergence. Unfortunately, at present, this energy source has been used for commercial electricity production is very low in which it takes within 1% in total energy used. The target for next years is commercial electricity generated by renewable energy try to take 5% and 11% in 2020 and 2050, respectively. This paper reviews the current situation of renewable used in Viet Nam and analyzes some important issues related to the national policies development for renewable energy such as legal framework, financial supports, and renewable energy consumption prices and so on. These policies shall help to promote investment in renewable energy; to increase the structure used renewable energy, and to develop renewable energy in Vietnam.

Keywords— Renewable energy, energy policy, sustainable development in Vietnam

INTRODUCTION

According to Prime Minister's Decision No. 53/2004/QĐ-TTg on 17th August 2004 about Strategic direction for sustainable development in Vietnam, some types of clean energy which are high potential and can be widely used in household scale such as solar and wind energy, small hydropower and biogas have not been properly studied, applied and generalized. There is a lack of solution for encouraging the use of clean and environmental friendly energy. Therefore, priority activities are support for research, transfer and application of environmental friendly energy systems including new energy sources and renewable energy sources; encourage the use of less used energy technologies and energy saving programs; preferential financial support for renewable energy development. On 2nd August 2007, Prime Minister made a decision No. 130.2007/QĐ-TTg about financial policy for investment projects in clean development program (CDM) including projects for electricity generated from renewable energy sources. On 16th June 2009 World Bank signed the agreement on providing 200 million USD for increasing of renewable energy supply for national electricity network in Vietnam (Lu et al, 2009; Prime decision). Vietnam is going to achieve the target of 5% in 2020 and 6% in 2030 (Nguyen, 2009). Therefore, the paper shows the current situation and renewable energy exploitation and the current legal framework for renewable energy development; and some suggestions for promotion of renewable energy development in Vietnam. It then proposed solutions for improving renewable energy policy in Vietnam. There's gradual declining in Vietnam

country's fossil fuel resources due to the fact that the reserves is limited but the demand is growing and this energy using causes serious environmental pollution. Meanwhile, Vietnam is one of the countries having huge renewable energy reserves in potential. And the development of renewable energy will contribute to reduce not only the fossil fuels spending but also greenhouse gas emission. This article has the following main contents: Overview of Renewable Energy in Vietnam; The current situation and renewable energy exploitation and in potential, the current legal framework for renewable energy development; and some suggestions for promotion of renewable energy development in Vietnam.

Vietnam is one of the countries having renewable energy source in high potential distributing throughout the country. According to the estimation, biomass in potential from waste products or agricultural waste is about 10 million tons per year; biogas from garbage, animal manure and agricultural waste is approximately 10 billion m³ per year; small hydro power (<30 MW) is 4000 MW, and solar power radiation with average sunny radiation is 5 kWh/m² per day. Besides, with more than 3,400 km of coast, Vietnam has plentifully wind power source of about 500-1000 kWh/m² / year in estimation. These renewable energy sources when being used will meet the rapidly growing demands.

Small hydropower: The extraction of small hydroelectricity in the recent time is estimated to account for about 50% of its potential, of which the rest is located in remote or unfavorable areas. According to recent reports, there are over 1,000 sites that have been identified with potential small hydropower development, scale from 100kW to 30MW with a total installed capacity of 7.000MW. The sites are located mainly in the northern mountainous region, the South Central and Central Highlands.

Wind power: Considered as a country with potential development of wind power but current data on Vietnam's wind power system has not been fully investigated, due to lacking of exploration and measurement. Data assessment of wind power potential has large fluctuations. According to reports, the wind power potential of Vietnam is most concentrated in the central coastal region, Southern Highlands and Islands.



Fig 1. Vietnam renewable energy in potential is very plentiful but not yet estimated in full- Photographic image

Biomass: Being an agricultural country, Vietnam has huge potential for biomass power. The capacity of sustainable exploitation of biomass resources for power production in Vietnam is estimated to be about 150 million tons per year. The production of biofuels has been piloted and commercially produced. In the production of electricity from biomass, some outstanding projects in Vietnam that worth mentioning is thermal power cogeneration from bagasse and rice husks.

Solar energy: solar energy for power production comes mostly from solar power cell which are installed in rural, mountainous and island areas. The solar cell system has been in the provinces and cities nationwide. Solar power is used primarily for purposes such as water heating, power generation and other applications such as drying, cooking. With high sunshine hours total to more than 2,500 hours/year, the total average annual radiation around 230-250 Kcal/cm² ascending towards the south are good conditions for the development of solar technology.

Geothermal energy: Despite lacking of a thorough investigation on geothermal, the most recent survey data and assessment indicates potential for geothermal power in

Vietnam can be over 300MW. The area with the ability to effectively exploit geothermal energy is the Central.

Thus, there are 5 types of renewable energy has been exploited to produce electricity in our country at present. According to incomplete statistics, the total installed capacity is about 1,215 MW. The renewable energy sources that are being exploited: small hydropower (1000 MW), biomass (152 MW), domestic waste (8 MW), solar (3 MW) and wind (52 MW), which is described as shown in Table 2:

Table 2. Five potential of renewable energy

Line	Sources	Capacity(MW)
1	Small hydropower	1,000
2	Wind power	52
3	Solar power	3
4	Biomass	152
5	Domestic waste	8
Total		1,215

Current situations of renewable energy exploitation is very small compared with the potential, which is accounted for 3.4%. Meanwhile, according to Electricity Planning VII, targets are set to increase the proportion of electricity produced from renewable energy sources accounted for 3.5% in 2010 to 4.5% and 6% in 2020 and 2030, respectively. With the current situation and forecast of the future, Vietnam needs specific solutions to improve the development of renewable energy.

Policy for renewable energy in Vietnam is operated based on the needs of energy for economic development and environmental protection. As the demand for energy in Vietnam is forecast to rise four times in 2005-2030 and the demand for electricity will increase nine times in 2005-2025, exploiting renewable energy will help reduce reliance on imported energy sources and ensure national energy security for Vietnam. Being aware of the importance of renewable energy, the Government of Vietnam has issued many policies to encourage the development of renewable energy, set the target of using renewable energy and direction to a competitive electricity market with diversified investment and business model. Accordingly, the Prime Minister issued Decision No. 1855/QD-TTg 27/12/2007, approved the National development strategy of Renewable Energy of Vietnam by 2020, with a vision to 2050, and Decision No. 1208/QD-TTg dated 21/7/2011 approved the National plan of development of electricity in 2011-2020, taking the year

2030 in consider (master Plan VII), Decision No. 20 177/2007/QĐ-TTg / 11/2007 approved "The project of developing biofuels by 2015, with a vision to 2025", in which:

The government has set the target of increasing the share of renewable energy in total primary commercial energy from 3% in 2010 to 5% in 2020 and 11% in 2050 and increase market share of electricity production from renewable energy sources such as wind and biomass from 3.5% of total electricity production in 2010 to 4.5% in 2020 and 6% in 2030.

Regarding biofuels, the Government has set a target of achieving an annual output of 100 thousand tons of E5 gasoline and 50 thousand tons of B5 gasoline by 2010, equivalent to 0.4% of total petroleum demand expected for the whole country; 1.8 million tons of ethanol or 5% vegetable oil or petroleum demand in 2025. E5 gasoline is gasoline that contains 5% biodiesel in total volume; B5 is oil containing 5% biodiesel in total volume

To achieve this goal, the government has given many incentives for investors. The renewable energy plants will receive investment incentives, preferential tariffs and tax incentives. Investors can enjoy other privileges such as exemption from import tax and land-using tax exemption for a period of time. Specifically, Joint Circular dated 04/07/2008 58/2008/TTLT-BTC-BTN Environment of Ministry of Finance and the Ministry of Natural Resources and Environment has defined objectives , conditions and method of calculating subsidized rate per unit of production, the amount of annual pension, provision for pension and process of pension request submission for renewable energy projects . However, the current incentives are not enough to form the appropriate conditions for the planning and deployment of renewable energy projects as well as selling the products of renewable energy in Vietnam. The only benefit incentives for small hydropower projects not bring much benefit to other forms of renewable energy.

RESULTS AND DISCUSSIONS

Based on the above analysis, there are some recommendations as the following:

Making the proper policies of renewable energy resources development encouragement and the reasonable price policies

To do this, the policy makers should concentrate on the 3 important issues as the following:

Firstly, the policy objectives must be clearly defined, approved by a large number of people, and have flexible mechanisms of promotion while maintaining the stability. This is the basis of implementation of renewable energy price policies as well as many other policies for sustainable renewable energy development.

Secondly, the decision-making process related to renewable energy need to show transparency, accountability and cooperation among whom may it concern. This is important to attract quality contractors for renewable energy resources

Thirdly, the plan making and implementation of the renewable energy policies must be based on infrastructure and technology corresponding with clear steps from short, medium to long term. These are important factors for not only widespread development of renewable energy technologies but also for the contribution to the development of the energy market with fair competition and reasonable prices for all kinds of energy.

Building the national energy planning

Our country has a huge potential for renewable energy but until now there have not been yet comprehensive studies to know exactly how much it is. Therefore, the planning will help build the full, systematic and reliable data of renewable energy resources using and exploitation potential. From that, we can determine the proper plans of renewable energy resources development in each period and each area.

Making specific plans implementing electric production programs from renewable energy resources.

It should be provided specific timelines for each period in the roadmap. Initially, it should be focused on the model of electricity power having transmission grid and low voltage of 220. The reasons are this electric power corresponding with the normal devices and easy to regulate the load demands, and that it is more convenient to manage its operation and maintain this electric power. On the other hand, it is necessary to build the service network to provide specialized equipment in the electric system from renewable energy as the controller, inverter ... and to compile clear documentations for using, and maintenance for the people.

Increasing investment in the basic researches on renewable energy technologies

An important factor in promoting the development of renewable energy is to increase investment for the basic researches. The country needs to arrange amount of budget to develop renewable researches such as investigation the potential in each areas, transfer high tech and renewable energy technologies from outside to Viet Nam to adopt the most appropriate technologies in renewable energy exploitation and using in each area and so on. Simultaneously, by doing this, we can be active in selecting and using technologies in renewable energy exploitation.

CONCLUSIONS

In short, Vietnam country's conventional energy resources is gradually declining because the reserves is limited but the demand is growing. Moreover, there is serious environmental pollution caused by using this resources of

energy. The development of renewable energy is to contribute to reduce the consumption of traditional energy such as coal, oil, gas and to reduce greenhouse gas emission. Therefore, Vietnam needs to increase investment and support for the development of renewable energy to protect the environment, which ensure an efficient and sustainable development of energy for the country.

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