

Exploitation and Use of Bioenergy during the Implementation of Vietnam's Green Growth Strategy: Status and Policy Recommendations

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Abstract: Bioenergy exploitation and use play an important role in the implementation of the National Green Growth Strategy recently approved by the Government of Vietnam. This article focuses on the legal framework and policies for bio - technology development in Vietnam, the potential and current status of bioenergy exploitation and use, and points out existing obstacles and bottlenecks based on which it will make some policy recommendations for enhancing the exploitation and use of bioenergy sources in Vietnam.

Key words: Bioenergy; bio - technology, green growth, policy.

The persistently high economic growth rate experienced by Vietnam over the past years has led to an increase in electricity demand and consumption. During the period of 2001-2011, electricity production (including imported sources) grew at an annual average rate of 13.8%, which was nearly twice the rate of overall economic growth. Electricity demand is expected to maintain its growth momentum in the upcoming period, averaging at around 10% per year throughout the period of 2011 - 2030. This presents various problems related to energy security and environment. According to estimates by the OECD (2011), if Vietnam's energy sector continue to use traditional fossil fuels, its emissions level in 2030 will increase 5.5 times compared to today's level. Currently, fossil fuels occupy a significant share in the total output of the electricity industry. Given its geographical, climatic advantages and natural characteristics, Vietnam has vast

potential in renewable energy, including: hydropower, solar energy, wind energy, bioenergy. In order to exploit these potentials, over the past years, the Government of Vietnam has enforced many policies to promote the development of these energy sources, including assistance in land use and capital, tax and cost incentives for environment protection initiatives, etc. There exists, nevertheless, many problems and challenges for the development and encouragement of the use of renewable energy, including of bioenergy.

1. The legal framework and policy for developing bioenergy in Vietnam

Policies and mechanisms for promoting the development of bioenergy in Vietnam have been included in various legal documents:

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Law on Electricity of 2005, Law on Environment of 2005, Law on Environment Protection Tax of 2010, Law on Investment, etc. as well as in many decrees and sub-law documents. Below are some key policies related to biomass energy.

- The 7th Power Development Master Plan (PDP 7) set out the target of having renewable power occupy 4.5% of total power generation in 2020 and reaching 6.0% in 2030. This means that the installed capacity will reach 3,192 MW in 2020 and 9,892 MW in 2030, equivalent to 4.1% and 6.9% of total installed capacity across the system in 2020 and 2030, respectively. Under this master plan, the targets for wind power and biomass power are also clearly determined. The specific targets for wind power are 1,000 MW in 2020 and 6,200 MW in 2030, while for biomass power is 500 MW in 2020 and 2,000 MW in 2030.

- Decision No.24/2014/QĐ-TTg of the Prime Minister on March 24th 2014 on the mechanism for developing biomass power projects in Vietnam, with effect from May 10th 2014. This Decision prescribes the supporting mechanism for the development of power generation projects using biomass energy in Vietnam. The subjects of this Decision include organizations, individuals participating in power activities related to the development of biomass power projects in Vietnam as well as investors enjoying incentives in terms of capital, tax, land, etc.

- Decision No.177/2007/QĐ-TTg of the Prime Minister on November 20th 2007 approving the "Project on biofuels development until 2015, with an outlook to 2025". In this Decision, four key missions were put forward: Research and development, product testing for biofuels development; Establish and develop the biofuel production

industry; Build up the potential for biofuel development; Foster international cooperation. Incentives and supporting mechanisms for renewable energy development were also provided (see Annex 1 details). These policies have helped promote the development of the bioenergy industry, still at an infant stage, in Vietnam over the past years.

2. Potential for bioenergy development in Vietnam

The total area of Vietnam's natural land is around 330,095 km², 31% of which is agricultural land and 45% forestry land. Although the industrialization process has seen some initial success, agriculture still remains an important economic sector for Vietnam, with around 60% of the population working in the agricultural sector. The agro - fishery - forestry sector contributes to around 19.67% of the total gross domestic product in 2012 and 18.4% in 2013 (Statistical Yearbook of 2012, General Statistical Office). As a traditional agricultural country, Vietnam is home to a large and diverse biomass, from firewood, rice husks, coffee grounds, straws and bagasse. Agricultural residues are highly diverse and abundant in the Mekong Delta, accounting for around 50% of the country's total agricultural residues, while the Red River Delta contributes to around 15%. Every year, Vietnam generates around 60 million tonnes of biomass from agricultural residues, 40% of which are used to meet the energy demand of households and for electricity production (Vietnam Institute of Forest Sciences, 2012).

2.1. Potential for biomass energy development in Vietnam

2.1.1. Potential for biomass energy development from forestry

Biomass energy can be generated from

various sources: from wood (firewood) coffee, rubber, cashew, etc.), fruit trees such as tree - trunks, trees; from natural (orange, longan, etc.) and scattered trees. forest, productive forest, forestation, and Total firewood is estimated at 35.81 million tonnes (Table 1).

Table 1. Total energy - generating wood, 2011

Source	Total area (million ha)	Total wood (million tonnes)
Natural forest	10.45	14.07
Artificial forest	3.63	9.07
Barren land	6.41	2.47
Perennial industrial crops	1.63	2
Fruit trees	0.82	0.41
Other trees	4.45	7.79
Total	27.39	35.81

Source: Vietnam Institute of Forest Sciences, 2012

2.1.2. Potential for biomass energy development from crop residues

Annual agricultural residues are divided into two main types: i) after - harvest residues such as straws, sugarcane leaves and tops, corn leaves and stalks and cobs, cassava, coconut shells and husk fibers; and ii) waste generated from food processing such as rice husks, bagasse, peanut skin, coffee husks, bean husks, etc.

a. Residues from rice production and processing

Rice waste include: straws, stubble, within straws and stubble there are

cellulose and hemicellulose and some other organic compounds. When burned, these are disintegrated, releasing CO₂ and thus, causing pollution. CO₂ are one of the basic gases that create the greenhouse effect, a cause of global warming. Every year after the harvest seasons, an uncountable volume of CO₂ is released into the environment as a result of the above activities. According to the Statistical Yearbook of 2012, Vietnam's total rice crops area reached 7,753.2 thousand ha. The Mekong Delta accounted for over 50% of the country's rice output (Table 2).

Table 2. Vietnam's rice crops area, productivity and output by region in 2012

	Region	Total area (thousand ha)	Productivity ('00 kg/ha)	Total output (thousand tonnes)
1	Red River Delta	1,139.1	60.3	6,872.5
2	Northern midlands and mountains	674	48.8	3,264.4
3	North Central Coast	1,235.9	54.3	6,713
4	Central Highlands	228.1	49.5	1,129.4
5	Southeast	294.8	47.1	1,389.5
6	Mekong River Delta	4,181.3	58.1	24,293
	Total	7,753.2	318.1	43,661.8

Source: Statistical Yearbook of 2012, General Statistical Office

According to computations by the Institute of Energy Science, every tonne of paddy will generate 1.35 tonne of straws, and if milled, this

will create 0.15 tonnes of husks. Based on these figures, we can estimate the amount of straws and husks generated annually, as in Table 3.

Table 3. Total residues generated from rice crops

Unit: thousand tonnes

	Region	Total output	Straws residues	Husks residues	Total residues
1	Red River Delta	6,872.5	9,277.87	1,030.87	10,308.74
2	Northern midlands and mountains	3,264.4	4,406.9	489.66	4,896.56
3	North Central Coast	6,713	9,062.5	1,006.95	10,069.45
4	Central Highlands	1,129.4	1,524.69	169.41	1,694.1
5	Southeast	1,389.5	1,875.82	208.42	2,084.24
6	Mekong River Delta	24,293	32,795.55	3,643.96	36,439.51
	Total	43,661.8	58,943.34	6,549.27	65,492.61

Source: Institute of Energy Science, 2012

b. Corn residues

Corn residues include cobs, corns, leaves and stalks. Usually, the corn cobs, leaves and stalks are used to feed livestock when fresh or turned into fuels

when dried. The heat that can be generated from corn cobs and leaves are quite significant, however, this type of fuel is still rarely used by farming households nowadays.

Table 4. Corn output by region in 2012

	Region	Total area (thousand ha)	Productivity (hundred kg/ha)	Total output (thousand tonnes)
1	Red River Delta	86	46.7	404.3
2	Northern midlands and mountains	646.8	36.3	1,696.2
3	North Central Coast	202.3	40.8	826.0
4	Central Highlands	243.9	49.8	1,214.3
5	Southeast	79.3	56.2	445.3
6	Mekong River Delta	39.4	55.2	217.5
	Total	1,297.7	285	4,803.6

Source: Statistical Yearbook of 2012, General Statistical Office

Also according to estimates of the Institute of Energy Science in 2011, corn residues are equivalent to 0.93% of total

corn output. Based on this, we can estimate the total corn residues, as in Table 5.

Table 5. Corn residues

	Region	Total output (thousand tonnes)	Total residues (thousand tonnes)
1	Red River Delta	404.3	375.6
2	Northern midlands and mountains	1,696.2	1,577.5
3	North Central Coast	826.0	768.2
4	Central Highlands	1,214.3	1,129.3
5	Southeast	445.3	414.1
6	Mekong River Delta	217.5	202.3
	<i>Total</i>	4,803.6	4,467.3

Source: Institute of Energy Science, 2012

It can be seen that corn residues are generated relatively evenly across all regions, with the Northern midlands and mountains accounting for the largest share.

c. Sugarcane residues

According to data from the Vietnam Sugar and Sugarcane Association in 2011, a tonne of sugarcane will generate around 0.2 tonne of residues, as illustrated in Table 6.

Table 6. Sugarcane residues

	Region	Area (thousand ha)	Output (thousand tonnes/year)	Residue (thousand tonnes/year)
1	Red River Delta	2.6	127.1	25.42
2	Northern midlands and mountains	21.9	1,037.8	207.56
3	North Central Coast	99.7	4,914.7	892.84
4	Central Highlands	26	1,196.8	239.36
5	Southeast	51	2,825.8	565.16
6	Mekong River Delta	64.1	4,628.3	925.66
	<i>Total</i>	265.3	14,730.5	2,856

Source: Vietnam Sugar and Sugarcane Association, 2011

2.2. Potential for biogas generated from livestock waste

Animal husbandry in Vietnam is mainly

focused on livestock (usually consisting of buffalos, cows, pigs) and poultry (chickens and ducks), as presented in Table 7.

Table 7. Total livestock and poultry as of January 2012

Year	Buffalos (thousand)	Cows (thousand)	Goats, sheep (thousand)	Pigs (thousand)	Poultry (thousand)
2012	2,712.0	5,194.2	1,343.6	26,493.9	308.5

Source: Statistical Yearbook of 2012, General Statistical Office

In order to compute the waste per animal, one can base on the weight of the livestock, however, this method is only suitable for on-spot checks and small scale estimates. In case of computing total national output, it is recommended to estimate the livestock waste per unit of livestock.

Table 8. Daily waste by selected livestock and poultry

	Name of livestock	Daily waster (kg/head)	Average daily waster (kg/head)
1	Cow	15 - 20	17.5
2	Buffalo	18 - 25	21.5
3	Pig	1.2 - 4	2.6
4	Poultry	0.02 - 0.05	0.035

Source: “Biogas technology at the household scale” – Program on biogas for Vietnam’s animal husbandry sector, 2011

Based on data from the Statistical Yearbook of 2012 and the table of daily waste of selected livestock, we can estimate the waste generated by some key livestock in Vietnam (Table 9).

Table 9. Daily waste of livestock

Unit: *tonne*

Year	Buffalo (thousand)	Cows (thousand)	Pigs (thousand)	Poultry (million)
2012	2,712.0	5,194.2	26,493.9	308.5
Daily waste (<i>tonne</i>)	58,308	90,898.5	68,884.14	10,797.5

Source: Institute of Energy Science, 2012

3. Status of bioenergy exploitation in Vietnam

3.1. Status of biomass energy exploitation and use

Vietnam’s total biomass used in 2010 was 12.8 MTOE, accounting for 25% of the total energy consumed nationwide (Table 10). The largest share of energy consumed was for cooking purposes. Fuelwood was the most used biomass, accounting for 65% of total biomass consumed. Bagasse was the second most frequently used biomass, with a share of 51%, mostly used for burning and generating power in sugar and

sugarcane plants. However, biomass use remains very modest compared to its real potential. So far, there is no biomass-using power plant built or operated in Vietnam. There are, however, around 10 investors who have submitted proposals for the construction of biomass power plants, with an average capacity of 10 MW/plant, 10 of which are of Vietnamese investors and two are joint ventures with foreign investors. The proposed projects concentrate mainly in Mekong River Delta provinces, specifically: two projects in Tien Giang, three projects in Dong Thap and one project in Kien Giang.

Table 10. Using biomass for energy production, 2011

Purpose of use		Type of biomass					Total
		Fuelwood	Rice husk	Straw	Bagasse	Other	
Heat creation	Cooking (in households)	6,552	395	990	88	890	8,915
	Kiln	663	405	-	-	100	1,168
	Incinerator	1,145	100	130	100	698	2,173
Combination of heat and power	Electricity cogeneration	-	-	-	552	-	552
Total		8,360	900	1,120	740	1,688	12,808
% of potential		61	38	10	51	34	38.2

Source: Ministry of Industry and Trade, 2012. (GIZ-MOIT, Renewable energy project, 2010)

With respect to on-grid power generated is used for sugarcane pressing generated from bagasse, total installed and sugar refinery. Only three plants can capacity is 88.5 MWe. The capacity of generate excess energy for connection to these plants ranges from 1.5 to 25 MWe the national grid, offering a price of (Table 11). The majority of the energy USD4 cents/kWh.

Table 11. Current capacity of bagasse-based power plants in Vietnam

#	Company	Current capacity (MW)	Investment status	Expanded capacity (MW)
1	Tay Ninh Bourbon JSC	24.0	Under expansion	34.0
2	Gia Lai Thermopower JSC	12.0	Under expansion	34.0
3	Ninh Hoa Sugar JSC	9.0	Under expansion	30.0
4	Cam Ranh Sugar JSC	25.0	Unchanged	25.0
5	Lam Son Sugar JSC	12.5	Unchanged	12.5
6	Soc Trang Sugar JSC	6.0	Unchanged	6.0
	Total	88.5		141.5

Source: Ministry of Industry and Trade, 2012

3.2. Status of biogas energy exploitation

Until late 2013, small scale biogas under construction and operation. Some projects were developed extensively across industrial scale facilities were also

established to treat the waste and waste water of industrial farms, factories, beverage manufacturing establishments, rubber, coffee production establishments, seafood processing establishments, canned fruit plants, tapioca production plants or alcohol plants. However, among these establishments, only a few are producing biogas for power generation in pig farms, which belong to San Miguel Animal Feed Joint Stock Company in Binh Duong. This facility has a total installed capacity of 17,000 m³ (power generation capacity 2 MW) and was invested by NLTT SURE Company of the Philippines. Other facilities were only designed to produce biogas to replace fuel oil or coal for distillation. Excess biogas is burned or discarded directly into the environment. However, even if these facilities are further developed for power generation, their installed capacity will still be limited, ranging from 1 to 3 MW only.

4.1. Some barriers and policy recommendations for bioenergy in Vietnam today

4.1. Some barriers to bioenergy development

Apart from price support mechanisms for wind power and biomass power approved in 2011 and 2014, Vietnam still lacks a comprehensive supporting mechanism for energy development. The key obstacles to the development of renewable energy nowadays include: (i) High production costs which deters businesses from joining this seemingly new market; (ii) Lack of support in selling prices, hence, making renewable energy less competitive than

other energy sources; (iii) Limited access to credit by renewable energy projects; (iv) Outdated local technology compared to the world, thus, preventing local businesses from producing market competitive products; (v) Poor and insufficient information and databases on planning, technology and supporting services for renewable energy.

The causes of these limitations are multifold but revolve mainly around the following key issues:

- Inadequate awareness on the role and importance of renewable energy. This is illustrated in the lack of necessary policies and legal framework. So far, a law on renewable energy is still absent while this is necessary to ensure a fundamental and systematic development of this energy source. Supporting mechanisms for renewable energy are thus very restricted, unable to drive and encourage the non - public sector to investing in the field.

- Lack of methodical State investment in technology for renewable energy. These technologies are now mostly imported at high prices, thus, raising costs and reducing the competitiveness of the products on the market. Research and development centers specializing in this field are still weak in number and quality. Meanwhile, the recently approved Green Growth Strategy is requiring for immediate and large State investment in this sector, otherwise the targets set out in this strategy can hardly be met.

- Lack of high quality human resources specialized in renewable energy. Textbooks and training courses for human resources in this area in universities are still at an early age and insufficient. Meanwhile, human

resource training is the first and critical element for the development of renewable energy technology.

- Lack of investment funds for renewable energy projects. Renewable energy projects, including biomass energy ones, still fail to receive effective State research, investment and experimentation. In case this is not feasible, strong incentives should be given to private businesses to encourage their investment in this type of projects.

- There is yet a comprehensive master plan, at provincial, city, regional and national levels, for the development of renewable energy sources that Vietnam has potential and advantage in. A comprehensive master plan is necessary to enable the formulation of resource allocation plans for developing renewable energy in the medium to long term. Furthermore, according to estimates by the Organization for Economic Cooperation and Development (OECD), Vietnam's energy sector, if maintaining its traditional pathway, will increase its emissions by 5.5 times from now until 2030. On the contrary, if we shift our development orientation towards renewable energy and enforce a new energy strategy, the emissions level in 2030 can be cut by 45% compared to today's figures and consequently, energy efficiency will improve proportionately.

- The information system and database supporting the planning, policy-making, technology development and supporting services for the renewable energy sector are insufficient and underdeveloped. Furthermore, communications tools are used inadequately when helping to raise public awareness

about the role of renewable energy sources. Methods for disseminating and communicating information broadly to the public lack diversity and effectiveness.

- There remain bottlenecks in the structure of Vietnam's energy market that prevent it from development. The sluggish implementation of the competitive power market together with the bulky power management system is significantly preventing Vietnam from having a smart power system and a healthy, competitive market.

To sum up, the actual situation of Vietnam's renewable energy sector shows that, despite initial steps in general policy and guidelines, there are yet signals of actual change and transitions as expected in this area. For a rapid and strong development of the renewable energy sector, the first priority is to review and dismantle existing barriers to the development of renewable energy in general and of bioenergy in particular.

4.2. Some policy recommendations for promoting bioenergy development in Vietnam

The world's renewable energy development was originally driven by energy crises at the global level, with the first one being the oil crisis in 1973 and 1979 - 1980. Forecasts about traditional energy sources all indicated that these would become exhausted by the second half of the 21st century. The subsequent emergence of threats to the environment such as pollution and climate change together with the need to diversify energy sources to ensure energy security have all created powerful stimuli for countries to revise their policies on energy exploitation and use. For Vietnam, the

development of renewable energy has become crucial to ensure energy security for the future, at the same time, it will help address climate change, create green jobs and green GDP.

By identifying the bottlenecks and the causes of these bottlenecks in the development of renewable energy sources, there should be policies addressing the key issues, as follows:

- Raise awareness on the immediate need to develop renewable energy: Diverse communication channels are needed to deliver full information on the urgent need for renewable energy development. There is a need to fill in the absent policies and legal frameworks, or more precisely, a law on renewable energy should be urgently drafted to ensure a legal corridor for the sector to develop methodically and systematically. The State should also issue timely supporting mechanisms for businesses, especially non-State businesses, to encourage them to develop, exploit and use renewable energy.

- Give priority to State investment in renewable energy technology. Particularly, research and development (R&D) centers specialized in this field should be constructed and nurtured to help develop technology for this field. An alternative is to focus on imitating and localizing foreign technology to help reduce unit prices of technology.

- Enhance training for high quality human resources in renewable energy. There is a need for a strategy that can help catch up with advanced countries in the world in renewable energy training to serve as basis for the development of renewable

energy technology and application equipment. A national energy strategy should focus on developing human resources to work in new areas. Experience from China and Germany show that in-depth training programmes on renewable energy are found in urban areas while in rural areas, officers and the people are provided with technical assistance and information through initiatives and projects.

- There needs to be financial incentives to encourage the investment of non - State businesses in this area. Particularly, substantial preferentials and privileges should be given to foreign - invested enterprises.

- There is a need for the formulation of a comprehensive master plan for the development of renewable energy in Vietnam. This master plan should cover in detail developments at provincial, regional and national levels.

- There is a need for the development of an information system and database to serve the planning and policy - making process, as well as to help with developing technology and supporting services for the renewable energy sector.

- There is a need for the development of a roadmap for the liberalization of the energy market that is now a monopoly system, distorting and creating bottlenecks for the development of the sector. A competitive power market will help allocate resources more efficiently, create stimuli for investment projects with high applicability and efficiency in the renewable energy sector in general and bioenergy sector in particular.

Annex 1. Supporting mechanism for renewable and biomass energy

	Name of legal documents and regulations	Incentives and supporting mechanisms for renewable energy development
1	Law on Electricity No. 28/2004/QH11 passed by the National Assembly on February 3 rd 2004	<ul style="list-style-type: none"> - Encourage the exploitation and use of new and renewable energy sources for power generation. Power plants using renewable energy will enjoy incentives in investment, electricity prices and customs duties. - Encourage organizations and individuals to invest in the construction of power grids and power stations using local energy, new and renewable energy to provide electricity to rural areas, mountainous areas and islands. - Government support: Support in investment capital, interest rates on investment credit, tax incentives. - Ministry of Finance is in charge of and shall coordinate with the Ministry of Industry and Trade in providing guidelines for the implementation of these supporting mechanisms.
2	Law on Environment Protection No. 52/2005/QH11 passed by the National Assembly on November 29 th 2005	Organizations and individuals investing in the development and use of clean energy renewable energy, and those manufacturing environmentally friendly products will benefit from Government incentives in tax, investment capital, land use for the investment, construction of manufacturing factories.
3	National Strategy for Energy Development until 2020 with an outlook to 2050 approved by the Prime Minister in Decision No. 1855/QD-TTg on December 27 th 2007	The Government encourages the development and use of new and renewable energy; provides financial support to programs for investigation, research, test production and development of pilot model on the use of new and renewable energy; provides preferential import tariffs on equipment and technology using new and renewable energy, as well as preferential tax on the manufacturing and circulation of these equipment.
4	Decision No. 130/2007/QD-TTg on August 2 nd 2007 of the Prime Minister on some	<p>CDM projects and products of these projects shall enjoy the following privileges:</p> <ul style="list-style-type: none"> - Taxes: CDM projects are exempted from import tariffs on imports used for creating fixed assets for the

	financial mechanisms and policies for investment projects applying clean development mechanism (CDM)	<p>project, on imports that are raw materials, materials, semi-finished goods which are not available domestically and are then imported to serve the production process. CDM projects also benefit from preferential corporate income tax rates.</p> <ul style="list-style-type: none"> - Land use fees: CDM projects are exempted from or discounted of land use fees, land rents in accordance with existing law. - Subsidies: Products of CDM projects can receive subsidies from the Vietnam Environment Protection Fund. - Investment capital support: As prescribed in Decree No. 151/2006/ND-CP.
5	Decree No. 124/2008/ND-CP on December 11 th 2008 of the Government detailing and guiding the implementation of some articles of the Law on Corporate Income Tax	<p>Renewable energy projects shall benefit from the following privileges in corporate income tax:</p> <ul style="list-style-type: none"> - Tax rates: Enjoy the corporate income tax rate of 10% within 15 years, with the possibility for extension until 30 years in the case of large scale projects, high technology projects or new projects in special need of investment. - Tax exemption, reduction: tax exemption for 4 years, 50% cut in payable taxes in the following 9 years.
6	Decision No. 18/2008/QĐ-BCT issued by the Ministry of Industry and Trade on July 18 th 2008 promulgating the avoidable cost tariff schedule and template of power purchase agreement of small power plants using renewable energy	Electricity companies shall purchase electricity by the avoidable cost tariff schedule and shall use the template of power purchase agreement of small power plants using renewable energy.
7	Decision No. 1208/QĐ-TTg on July 21 st 2011 of the Prime Minister approving	- Raising the share of renewable energy in total primary commercial energy from 3% in 2010 to 5% in 2020 and to 11% in 2030

	the National Master Plan for Electricity Development for the period of 2011-2020, with consideration to 2030	- Raising the share of electricity generated from renewable energy sources such as wind and biomass energy in total electricity output from 3.5% in 2010 to 4.5% in 2020 and to 6.0% in 2030.
8	Decision No. 37/2011/QD-TTg of the Prime Minister on June 29 th 2011 on supporting mechanisms for the development of wind power plants in Vietnam	<ul style="list-style-type: none"> - Agreement on electricity purchase for 20 years - Privileges in investment, taxes, charges, land, infrastructure - Support in electricity prices (grid): buying price equivalent to USD7.8 cents/kWh - Application of clean development mechanism (CDM)
9	Decision No. 18/2008/QD-BCT of the Ministry of Industry and Trade on July 18 th 2008 promulgating regulations on the avoidable cost tariff schedule and template of power purchase agreement of small power plants using renewable energy	Prescribes the conditions, order and procedure for the construction of small power plants using renewable energy, and connected to the national power grid (Small power purchase agreement).
10	Decision No. 24/2014/QD-TTg by the Prime Minister on March 24 th 2014 on supporting mechanisms for the development of biomass power projects in Vietnam	<ul style="list-style-type: none"> - Tax incentives: Biomass power projects shall be exempted from import tariffs on imports to be used as fixed assets for the project; and shall be exempted from corporate income tax - Land incentives: Biomass power projects, power lines, transformer stations shall be exempted from land use fees, land rents as provided by law; and shall be given support in land clearing and compensation. - For thermopower cogeneration projects: the buyer shall be responsible for purchasing the entire electricity output from the project at the transaction moment at the price of VND1,220/kWh (equivalent to USD5.5 cents/kWh).

Source: Authors' compilation, 2013.

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