

Bringing Biomass into the Lower Mekong Power Grid

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Lower Mekong Initiative Renewable and Clean Energy Business Dialogue 2015 Manila, 16th June 2015

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Biomass resources in Vietnam

Great biomass resources with more than 118 million tonnes annually

Wood energy and wood residues

Agricultural residues

Biomass resources	Amount for energy			
	usage (mill. Tons)			
Natural forest	14.07			
Planting forest	9.07			
Bare land	2.47			
Industrial perennial	2.00			
Fruit tree	0.41			
Scattered tree	7.79			
Wood cheeps	5.58			
Sawdust and shavings	1.12			
Building (timber from	0.80			
work and house repairs)				
Total	43.31			

Biomass resources	Amount for energy			
	usage (mill. tons)			
Rice straw	40.00			
Sugar wastes (tops and leaves)	7.80			
corn residues	9.20			
Cassava stems	2.49			
Rice husk	8.00			
Bagasse	7.80			
Groundnut shells	0.15			
Coffee husk	0.17			
Cashew nut shells	0.09			
Others (estimated)	4.00			
Total	74.90			

(Source: Nguyen Duc Cuong, GIZ 2011)

Utilization of biomass

- Wood residues: 61% is self consumption as fuel in industrial kilns or household cooking.
- Rice straw: Only 10% is used as fuel, about 40% is used as mushroom planting, construction material etc. remaining is burn of left at the rice fields.
- Rice husks: About 38% is used as fuel in Mekong Delta, rice husk pellet and briquette production are increasing. Several rice husk power generation projects in the pipeline.
- Bagasse: About 51% of bagasse is burned to feed boilers that produce heat and power for sugar refining. Only 5/40 sugar mills connected the producing electricity to the grid.
- Other by-products: 34% is used as fuel (coffee bean shells, peanut shells, corn stems and cobs, soybean plants, coconut shells, sugarcane leaves and buds, sawdust and wood chips)

Utilization of biomass by type and user (kTOE in 2010) (Source: Institute of Energy, Vietnam 2010)

User		Biomass type				Total		
		Fuel wood	Husk	Straw	Bagasse	Others		
Heat	Cooking stove (residential cooking)		6552	395	990	88	890	8915
	Kiln		663	405	-	-	100	1168
	Burner		1145	100	130	100	698	2173
СНР	Combined generation	energy	-	-	-	552	-	552
Total			8360	900	1120	740	1688	12808
% of potential		61	38	10	51	34	38.2	

Utilization of biomass

Briquette production:

- Starting machines capacity 70-100 kg/hour of rice husk, now up to 500 kg/hour.
- About 30-50 rice husk biomass briquette producers in Vietnam.



Pellet production:

- Capacity 30-50 tonnes/day of rice husk.
- Less than 10 rice husk biomass pellet producers in Vietnam.
 Average capacity of 10,000 tonnes/year.



Legal framework on biomass

Power Development Master Plan (2011-2020 with outlook to 2030, PDP VII. (Decision 1208

by the PM in 2011). Renewable energy development target:

- 2020: 5.6% in capacity, of which 500 MW of biomass
- 2030: 9.4% in capacity, of which 2,000 MW of biomass

Green Growth Strategy (Decision 1393 by the PM in 2012)

- In crease the proportion of RE in electricity production and consumption
- Formulate support mechanisms and fiscal policies to maximize RE on grid-connected and off-grid areas.
- Support and develop waste treatment industry to produce energy

Supporting mechanisms for biomass based power projects (Decision 24 by PM in 2014): provides regulation on the planning of biomass power and incentives. To enjoy the incentives, the project should be included in development master plan.

- FIT for combined heat and power generation projects: 5.8 US cent/kWh (excluding VAT)
- FIT for biomass IPP projects: Avoided cost based tariff is applied, not yet available
- Duration of support: 20 years
- Other incentives

Legal framework on biomass

Summary of key incentives for grid-connected renewable energy projects

Project development phase:

- ✓ Import tax: exemption on goods forming fixed assets, which cannot yet be produced locally
- ✓ Investment incentive: owner of renewable energy project can obtain loans of up to 70% of the total investment cost from the Vietnam Development Bank (VDB) at an interest rate equivalent to that of a 5-year government bond plus 1% per year.

Operation phase:

- ✓ Corporate tax:
 - Tax rate: 10% for 15 years, possible extension to 30 years
 - Tax exemption for first 4 years, 50% tax reduction for next 9 years
- $\checkmark\,$ Accelerated depreciation rate
- ✓ Power purchasing price: preferential (5.8 US Cent/kWh or ACT)
- $\checkmark\,$ Land use levy and fee: free
- Environment protection fee: free

Key technical support projects in biomass

- Project: Support for the Development of Renewable Energy in Viet Nam (3/2012 8/2015)
 - Implementing agency: GIZ. Partner: General Directorate of Energy, Ministry of Industry and Trade (MoIT).
 - ✓ Main Activities:
 - Advise MoIT on the design of incentive mechanisms to encourage grid-connected power generated from biomass, biogas and solid waste
 - Support capacity development for relevant stakeholders in bioenergy sector with the regional and international training events, exchange formats and consultation mission
 - Support the development of national and provincial organizations and agencies dedicated to the advancement of renewable energy in Viet Nam
- Project: Multi benefit solution to minimize climate change in Vietnam and South East Asian nations by development of biomass energy (2011-2016) funded by JICA.
- Project: Greater Mekong Sub-region (GMS) technical support project for increasing the usage of biomass waste sources (2011-2015) funded by ADB & NDF.

Current efforts to support biomass development

- Preparation of provincial and national biomass power development master plans.
- Public consultation of the circular on biomass power projects, including standard PPA and
 FIT for biomass IPP projects in May 2015. expected to be issued by September 2015.

Biomass projects in sugar mills

Bagasse

- 41 sugar mills have co-generation systems with total installed capacity of 154.4 MW while potential capacity is 500 MW.
- Only 6 co-generation systems selling excess electricity to the grid with combined capacity of 88.5 MW, while potential capacity is 141.5 MW.
- Selling tariff: 5.8 US Cent/kWh (following Decision 24)



Biomass projects under planning in Mekong Delta (2030)



Source: Institute of Energy, 2014

Key barriers

Legal framework

- Uncompleted legal framework on RE
- FITs are fixed numbers with unclear revision progress. Unclear relationship between FITs and RE development plans.

Planning

- Unreliable data
- Lack of provincial electricity development master plan; list of investment project has not been developed
- Poor project preparation: FS, basic & detailed design, licensing and permitting

Feedstock provision reliability?

Feed-in-Tariff

 Unattractive in biomass sector for co-gen projects while other power generation projects are unknown.

Conclusions

- Vietnam has great potential to develop biomass but the exploitation is limited and not correspondent to the nation's potential.
- Investment support and incentive mechanisms have been issued. This is solid basis to promote the development of biomass markets in Vietnam but still need attractive FIT.
- Legal framework on biomass development is under completion with supports from international organization such as GIZ.
- Potential investment in biomass power generation could be bagasse co-generation projects and rice husk power generation projects.

Thank you for your attention!



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