Biomass Opportunities in Vietnam

>> Focus on energy and climate change
In Focus

Location on globe: South-east Asia, bordering the Gulf of Thailand, Gulf of Tonkin and South China Sea as well as China, Laos, and Cambodia

Land area: 331,210 km²
Population: 91,519,289 (July 2012)
Age demography: Youthful (69.3% between 15-64 yrs, median age 7.8yrs)

Economy: Vietnam’s GDP over de last decade was a spectacular 7% average per annum, though the global recession has dampened this somewhat.

In 2011, exports increased by more than 35%, year-on-year. The trade deficit, while reduced from 2010, remained high. This prompted the government to maintain administrative trade measures to limit the trade deficit. Vietnam’s managed currency, the dong, continues to face downward pressure due to a persistent trade imbalance. (CIA Factbook)

Source: This factsheet outlines the mid-term outlook for biomass exploitation in Vietnam for entrepreneurs and other agents. Unless otherwise specified, all information was drawn from the recent Report commissioned to SNV Vietnam by NL Agency, downloadable at www.agentschapnl.nl/ biomass, see under Publications > General Reports.

Business case for biomass in a nutshell
- Economic growth rate increases projected demand for energy
- Vietnamese government fears dependency on fossil fuels: new policy sets target to increase renewable energy share in total commercial primary energy from 3% in 2010 to 5% in 2020 and 11% in 2050. Electricity market is slowly adapté to this new reality.
- Business opportunities are open for collaboration between Vietnamese and Dutch business in these areas:
  - Knowledge transfer and capacity building
  - Management and consulting
  - Biogas and landfill gas-related projects
  - Technological expertise
  - Biomass-related projects
  - Financial services and expertise

Potential feedstocks

The source report by NL Agency features 15 feedstocks subjected to further research. This factsheet summarizes findings for the eight feedstocks most elaborately reviewed.

More information (and information concerning bracketed feedstocks) you will find in the report.

1. Bamboo
2. Cassava
3. Coconut
4. Coffee
   (Corn)
   (Manure)
   (Organic municipal solid waste)
5. Jatropha
6. Rice
7. Sugarcane
8. Wood
   (Fish waste)
   (Tea)
   (Miscanthus)
   (Algae)

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3. Coconut
- Vietnam is the largest exporter of nuts for fresh consumption
- Husk and shell hold limited potential as feedstock

4. Coffee
- Second largest export product
- Three different production processes: wet, semi-wet, dry
- Wet and semi-wet hold potential for biogas
- Stakeholders are many and diverse

5. Jatropha
- Grown small scale and test scale in Vietnam since 2006.
- Industry ready for scaling up, but requires assistance:
  - Support and knowledge exchange
  - Financial support
  - Technical support for conversion into oil

6. Rice
- Vietnam is second biggest rice exporter in the world
- Rice straw, unlike rice husk, is not utilised. This has large potential.
- Rice husk burning is currently a countrywide environmental hazard.

7. Sugarcane
- Sugar production is declining, while demand increases
- Using bagasse as a fuel for primary process heat and/or electricity generation is mature technology in the sugar industry.
  Cogeneration holds much growth potential as well as more efficient conversion technologies.
- Two Mtonnes (=million tonnes) of bagasse are used annually by sugar plants for burning in steam boilers to produce at least 560 million kWh of power
- The highest feed-in tariff received by these plants is 4US cents/kWh
- Waste water from sugar processing can be used for biogas production
- One factory in Phu Tho province presently uses molasses, in combination with cassava to produce ethanol.

8. Wood residues
- Wood processing industry has developed rapidly.
- 90% of timber was harvested from plantation forest.
- Still a potential opportunity for conversion of wood residues into energy carriers or energy.
- Three categories:
  - Residues from logging: 2.2 Mtonnes
  - Saw milling: 2.35 Mtonnes.
  - Scattered trees: 50,000 tonnes

Conversion technologies
A wide range of conversion technologies is used for bio-energy production in the country. Most technologies are still in a start-up phase, and involve pilot-scale projects, at varying levels of commercialisation and deployment.

Biomass-to-electricity continues to be a challenging arena, with persistent low electricity prices and the absence of feed-in tariffs.

Opportunities

Knowledge transfer and capacity building
There is a general need for knowledge transfer and capacity building in all bio-energy related technologies, also regarding R&D.

Management and advisory skills
International Management and Advisory is also requested, especially when it comes to large scale industrial projects. Even though there are already several such Dutch companies active in Vietnam in this field, the bio-energy sector is not yet aware of what Dutch business has to offer in this area.

Biogas and landfill gas-related expertise
Biogas is one of the fastest growing and booming sectors in Vietnam. This automatically results in a larger demand for upstream and downstream equipment. Gas recovery from landfill is not yet introduced, and is a high potential area of cooperation.

Technological expertise
- **Densification**
  Densification (pelleting, briquetting) technologies, as well as combustion and (co-)generation technologies are not widely available in Vietnam. Supply of technology as well as knowledge is desirable.
- **Improved Cookstoves**
  On a household level, the introduction of Improved Cookstoves is a business opportunity for both NGO’s as well as commercial parties.

Biomass-related projects
Many of the feedstocks mentioned in the report are not only available, but also currently represent a threat to the environment. Rice husk, rice straw, coconut pitch, sugar cane bagasse and coffee waste: these waste flows are currently not being dealt with in an environmentally sound manner, i.e. directly flushed into waterways or dumped. The utilization of these resources is therefore a business opportunity as well as an environmental benefit. Rice straw can be said to have the largest potential in this respect, but at the same time also poses the greatest challenge.

Financial expertise
There is a need for financial consulting in a wide variety of areas. Many of Vietnam’s financial institutions are currently developing and lack the sophistication and experience available in other regions. Creating a more favourable credit environment for entrepreneurs, for example, is high on the list of priorities.
Challenges

Sustainability-specific challenges

Deforestation
In the case of cassava, sugar cane and bamboo, evidence suggests deforestation occurs to free up land for cultivation. Both the market for cassava and for cane sugar are currently stretched, so any initiatives in these areas will do well to take this into consideration.

Policy-related challenges

Electricity sales to the net
Regarding electricity production in Vietnam, a lack of adequate policies and regulations to even allow, let alone encourage the purchase of energy from (small) energy producers. This vacuum in current legislation makes single-feedstock power plants fired with bagasse or rice husk largely uneconomical.

Slow change
Another issue is the ongoing government support for conventional fuels. When it comes to electricity production, the current pricing system favours coal over renewables or bio-energy. Unfortunately, coming to favourable agreements on feed-in tariffs for non-state owned enterprises and initiatives have until now not been successful.

High investment costs equipment
When it comes to investment in (energy) technology many organizations are reserved. Several reasons are identified for this attitude:
• Vietnamese companies often invest in cheap technologies, which are often inefficient. Furthermore they often choose to repair machines endlessly rather than replace with newer, more efficient technologies. Outdated technology therefore has a long lifetime and new technology is slow to gain ground.
• Many of the agricultural processing factories - ie. the owners of residues - are state owned. Energy prices in Vietnam are low, and still (in)directly subsidized. Energy costs as part of operational costs are relatively low, which drains incentive to invest.
• Furthermore businesses tend to focus on maintaining and improving their core business, like rice or sugar production, without much incentive for the innovative approach.

Biomass availability
Residues are mostly scattered and no reliable waste collection systems exist yet. In most cases, only large-scale export of feedstock is economically viable. Absence of policy for waste collection is a therefore a challenge.

Knowledge levels
In the field and in rural areas there is a lack of current information on bio-energy technologies. Biomass or residue owners do not have updated information or knowledge on suppliers. There is still the perception that investment costs of biomass power plants are always very high.

Logistics

Land

Road
The total length of the Viet Nam road system is about 222,179 km with 19.0 % paved, mainly national roads and provincial roads. Expressways are rather a new concept for Vietnamese, traffic is growing rapidly but the major roads are dangerous due to inappropriate design and an inappropriate traffic mix.

Rail
The Vietnamese railway network has a total length of 2,600 kilometres, dominated by the 1,726 kilometres single track North-South Railway running between Hanoi and Ho Chi Minh City. The overall condition of railway infrastructure in Vietnam varies from poor to fair; most of the network remains in need of rehabilitation and upgrading, having received only temporary repair from damages suffered during decades of war.
National railway company Vietnam Railways has proposed a high-speed rail link between Hanoi and Ho Chi Minh City, capable of running at speeds of 300 km/h. Vietnam’s National Assembly rejected the high speed rail proposal, citing its high costs; National Assembly deputies have asked for further study of the project.

Air
Vietnam operates 24 civil airports, including three international gateways: Noi Bai serving Hanoi, Da Nang serving Da Nang City, and Tan Son Nhat serving Ho Chi Minh City. Tan Son Nhat is the largest, handling 75 percent of international passenger traffic. Vietnam Airlines, the national airline, has a fleet of 30 aircraft that link Vietnam with 19 foreign cities.

Sea
Three major harbours in Vietnam are:
• Hai Phong (10 – 20,000 DWT)
• Da Nang (up to 45,000 DWT) and
• Ho Chi Minh City (up to 20,000 DWT).
This means Vietnam can currently only receive Medium Range Tankers or Small/Handysize Bulk Carriers. (Source: Wikipedia)
Relevant ministries and policies

Relevant ministries
Ministry of Industry and Trade (MOIT)
Ministry of Natural Resource and Environment (MONRE)
Ministry of Construction (MOC)
Ministry of Agriculture and Rural Development (MARD)

Policies
Decision 1208/QDTTg, by Prime Minister 21/07/2011
Title: National Power Development Plan period 2011-2030 (Master Plan VII)
Objectives and targets:
• Increase the share of renewable energy in total commercial primary energy from 3% in 2010 to 5% in 2020 and 11% in 2050
• Increase the share of electricity generated from renewable resources from 3.5% of total electricity generation in 2010 to 6% in 2030

Decision 2149/QDTTg by Prime Minister 17/12/2009
Title: National strategy on comprehensive management of solid wastes for period up to 2025, vision to 2050
Objectives and targets concerning recycling, reuse and energy recovery of solid waste:
• By 2015: 60%; by 2020: 85%; by 2025: 90%; by 2050: 100%

Decision 1855/QDTTg 27/12/2007
Title: National energy development strategies for Vietnam up to 2020, outlook to 2050
Objectives and targets:
• Share of RE is 3% of total primary energy supply in 2010; 5% (2020), and 11% (2050)
• Completion of RE, mountainous program. Share of households using RE in cooking is 50% (2010) and 80% (2020). By 2020, 100% HHs have electricity
• Considering establishment of RE development fund

Title: Bio-energy development study report for period up to 2015, outlook to 2025
Objectives and targets:
• 2010: development of models for experimenting and using of bio-energy, meeting 0.4% of gasoline and oil demand in country
• 2015: production of ethanol and vegetable oil is 250,000 tonnes, meeting 1% of gasoline and oil demand in country
• 2025: production of ethanol and vegetable oil is 1.8 million tonnes, meeting 5% of gasoline and oil demand in country

Stakeholders & Relevant contacts

National management & policy
MOIT Policy & National plan on Trade and Industry
MOC Policy & National plan on Construction
MARD Policy & National plan on Agriculture - Bamboo, Coconut
Department of Crop Production Policy & National plan - under MARD - crops, trees
Livestock production Department Policy & National plan - under MARD - livestock
Vietnam Administration of Forestry Policy & National plan - under MARD - forest
MONRE Policy & National plan on Environment
Vietnam Environment Administration Policy & National plan - under MONRE - waste

Research and Development
Bioseed Vietnam Part of DCM Shriram Consolidated Ltd., Research and developed bioseed
FSIV (forest science institute) Part of MARD - forest
Hanoi University of Agriculture Rice and other crops
Hoa Sen University Cooperates with Vietnam Biogas Association on Biogas
IPSARD Basic science research for agri. development - bamboo
ISPONRE Relates to environment policy
National Maize Research Institute Part of Vietnam Academy of Social Science, Research on gene and type of maize
Nong Lam University Rice and other crops
Thanh Tay University Pilot/research planting Jatropha
Vietnam Academy of Science and Technology Research & projects on bioenergy
Vietnam Institute Of Agricultural Engineering And Post-Harvest Technology Research & projects on policy, strategy, post graduation; technology transfer related to rice

Further reading
The source report commissioned by NL Agency contains many more stakeholders in the biomass arena including state-owned companies, NGOs and private companies.
Support for Dutch entrepreneurs

**NL Agency**
NL Agency is a great place to start if you’re interested in building a bio-energy project in Vietnam. We offer:

- business partner scans to assess suitability for collaboration
- trade missions to join
- sector-specific information in factsheets, reports and other resources
- trouble shooting and other expertise

**The Dutch Embassy**
The Embassy of the Kingdom of The Netherlands is your local partner in establishing reliable connections to Vietnamese businesses and public agencies. The Embassy is located in Hanoi:

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The NL Energie en Klimaat (Dutch Energy and Climate) division supports social development by working on energy and climate solutions for the future.

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**Trade mission in November 2012**

You are invited!

Would you like to gain first-hand knowledge of the Vietnamese biomass arena? Join the trade mission hosted by NL Agency and Cleantech Holland to Ho Chi Minh City and Hanoi from 12th until 17th of November, 2012. Participation costs are 1395 excl. travel, transfer and expenses.

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