Business Opportunities in the Ghanaian Biogas Sector

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Ghana has a significant potential for electricity generation from renewable energy sources such as solar, wind, small hydro and biomass. Against this background and with regard to the high oil prices and the large import dependence in the energy sector, the Ghanaian government intends to maximize the development of renewable energy in the national energy mix. Since Ghana has a regionally distinctive agriculture and food industry, the use of biomass for biogas generation, in particular, agro-industrial waste but also agricultural residues and animal waste will play a big role in achieving these goals.

Biogas Potential of Different Sectors

Biogas calculation with focus on

- **Agricultural residues** such as agricultural by-products, e.g. straw of rice, yam, cocoyam or millet, maize cobs and stalks or sorghum stalks
- **Residues from animal livestock** such as dung from cattle, goats, sheep, pigs or poultry farming
- **Agro-industrial residues** from food industry such as palm oil production (palm oil mill effluent, empty fruit bunches or palm kernel shell), pulp from starch production, fruit processing (mango peels, pineapple crowns or residues from juice production), brewery processes (sewage gas and sludge from wastewater treatment, spent grains), cocoa shells or processes and animal waste from abattoirs (paunch or blood).

The calculated theoretical biogas potential of organic waste is between 54 – 865 MW installed capacity /year (without/with crop residues and animal waste) and can cover 2.6 -42% of the total electricity production in Ghana (2016.4 in 2013).

Although the highest theoretical biogas potential from organic waste results from crop residues, however, the use of organic waste from agro-industry is in the foreground. There are two reasons:

- One of the most important factors for the successful implementation of medium to large-scale biogas projects is the collection of the feedstock. Thus irregular and small amounts of feedstock as well as an irregular quality from mainly small scale farming is problematic and collection will create traffic movement and enormous costs.
- Due to the large amounts of residues on the production site, for example in the oil palm industry, a high potential exists for bigger food processing companies to look for on-site power supply by energetic use of these waste materials. Biogas plants are attractive solutions to secure the constant energy supply for the production processes: avoiding production loss due to grid instabilities and increasing grid power prices.

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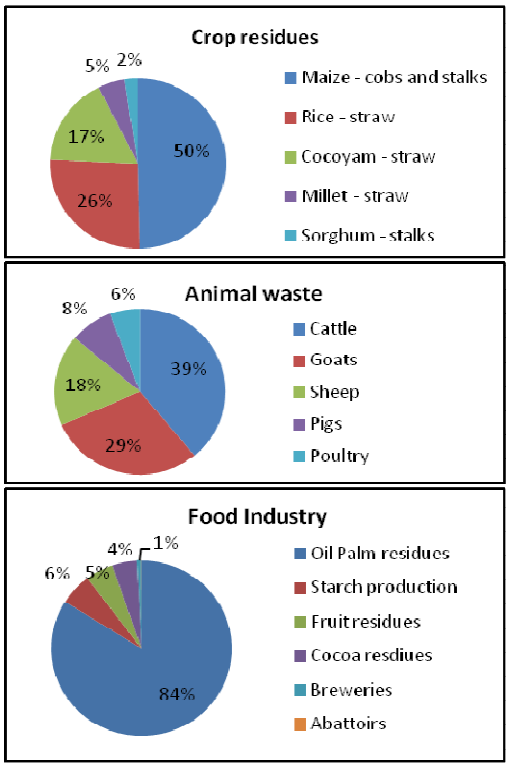
Biomass	Maximum potential electric capacity MW installed
Crop residues	**652**
Yam – straw	282
Maize - cobs and stalks	184
Rice – straw	97
Cocoyam – straw	62
Millet – straw	18
Sorghum – stalks	9
Animal waste	**159**
Cattle	62
Goats	47
Sheep	28
Pigs	13
Poultry	9
Food Industry	**54**
Oil Palm residues	46
Starch production	3
Fruit residues	3
Cocoa resdiues	2
Breweries	0.4
Abattoirs	0.05

General theoretical potential given by the available biomass



Legal Framework and Incentives

The Renewable Energy Act, 2011(Act 832) is providing the legal basis for Ghana's renewable energy targets and is supporting the participation of private sector in the electricity sub-sector by allowing independent power producers the access to the national power grid.
The key provision of the Renewable Energy Act is the feed-in tariff for electricity from renewable energies as funding instrument. There are different tariffs for solar, wind, hydro energy. The tariff, effective since 1st September 2013, for energy derived from biomass, landfill gas and sewage gas is defined as:

31.4696 GHp /kWh (15.76 UScent/ kWh)

Based on Ghana Cedi/ US Dollar Exchange Rate of GHS 1.9968 to USD 1 (August 27th 2013)

Potential Business Opportunities

Business opportunities for German companies exist in different areas that are connected with biogas technology and projects.

- Supply opportunities for plant manufacturers or installers as well as providers for plant equipment

Besides, there is a high demand for companies and consultants with project experience and technical know-how for the use and production of biogas:

- Biogas plant design and engineering companies
- Biogas EPC contractors: full responsibility for engineering, procurement and construction
- Maintenance and service providers for biogas technology
- Technical and biological support service
- Logistic providers for biomass transportation
- Maintenance and service providers for biogas technology
- Consultants for permit and licensing procedures
- Companies specialized in environmental management

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