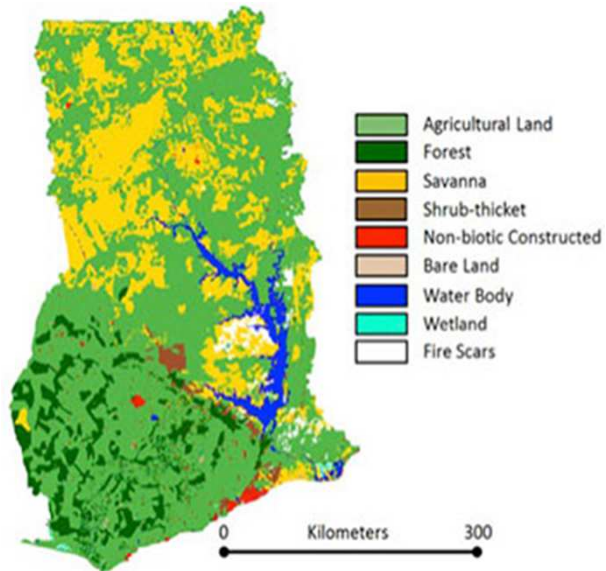


Ministry of Power

Meeting the Challenges:

Ghana's National Biomass Strategy



WACEE

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Introduction: *What is Biomass?*

- Biomass is a term used for all organic matter that is derived from plants as well as animals.
- Biomass resources include wood and wood wastes, agricultural crops and their waste by-products, municipal solid waste, animal wastes, wastes from food processing, aquatic plants and algae.
- It can be used to generate power, heat and steam, and for the production of transportation fuels.
- Bioenergy refers to energy produced from biomass.
- Bioenergy (Woodfuel, Biofuel and Biomass waste) is a dominant source of energy supply in Ghana.
- Biomass waste from agriculture and municipal sources also presents another stream of bio-energy resources.

Biomass Waste Potential

Production of different agricultural crops in Ghana for 2008 and estimated residue potential

Crops	Production (×10 ³ tonnes)	Residue type	Residue to product ratio (RPR)	Moisture Content(%)	Residue (wet×10 ³ ton nes)	Residue (dry ×10 ³ tonnes)	Lower heating value (MJ/kg)	Residue energy potential (TJ)
Sorghum	350	Stalk	2.62	15	917.00	779.45	17	15.59
Millet	160	Stalk	3	15	480.00	408.00	15.51	7.44
Rice	242	Straw	1.5	15	363.00	308.55	15.56	5.65
Sugarcane	145	Bagasse	0.3	75	43.50	10.875	13.38	0.58
Coconut	316	Shell	0.6	10	189.6	170.64	10.61	2.01
Oil palm fruits	1,900	EFP	0.25	60	4750	190.00	15.51	7.37
Coffee	165	Husk	2.1	15	346.50	294.525	12.56	0.04
Cocoa	700	Pods, husk	1	15	700.00	595.00	15.48	10.84
Maize	1100	Stalk	1.5	15	1650.00	1402.50	15.48	25.76
Total					4821.6			75.20

Source: Duku, M.H., Gu, S. and Hagan, E.H., 2011. A comprehensive review of biomass resources and biofuels potential in Ghana, *Renewable and Sustainable Energy Reviews*, 15(1):404-415.

Summary of high potential sites

Region	Town	Site name	Biomass Waste	Estimated Capacity
Western Region	Apimanim	Ghana Rubber Estates Limited	Rubber	1MWe
	Sefwi Boako	Buadac Enterprise	Saw Mill Waste	
	Samreboi	Samatex Company Ltd	Saw Mill Waste	
	Mpohor	Benso Oil Palm Plantation (Adum Banso Estate)	Fresh Fruit Bunches (FFB-oil palm)	600kWe
Ashanti Region	Juaben	Juaben Oil Mills	Fresh Fruit Bunches	1MWe
	Sokoban	Sokoban Wood Village	Saw Mill Waste	
Volta Region	Afife / Whetta	Wetta irrigation project	Straw / Rice Husk	1MWe
	Hohoe	Volta Forest Products	Saw Mill Waste	
Upper East Region	Bontanga	Irrigation site	Straw / Rice Husk	600kWe
Eastern Region	Kpong Irrigation	Irrigation site	Straw / Rice Husk	1MWe

SOURCE: Agro-Processing and Sawmill Wastes - A Biomass-Based Assessment for Grid Connected Electricity Generation (GEDAP / MoEP – 2014)

Challenges

- Over dependence on traditional biomass resources.
- Use of inefficient conversion devices.

Bioenergy supports a wide range of national policy goals such as:

- **Energy goals** including security and diversity of supply and the development of indigenous renewable energy sources
- **Environmental goals** such as greenhouse gas emissions reduction and waste management
- **New opportunities for farmers:-** The huge estimated potential of agricultural residues could significantly improve farmer's revenues; specially the smallholders
- **Employment generation in rural areas and enhancement of local economies:-** Bioenergy is amenable to small-scale production and processing, opening up opportunities for rural income growth, poverty reduction and economic transformation from raw material production to processed goods

Biomass Strategy

- Reduce the share of wood fuel in the total energy mix to 50% by 2020 through the dissemination of clean and efficient cooking stoves and alternative cleaner fuel options such as LPG, biogas etc.
- Increase the wood fuel supply base through the establishment of wood fuel plantations nationwide.

Biomass Policy Direction

- Woodfuel:

- Support sustained regeneration of woody biomass resources through legislation , fiscal incentives, and attractive pricing;
- Promote the establishment of dedicated woodlots for wood fuel production;
- Promote the production and use of improved and more efficient biomass utilisation technologies.
- Promote the use of alternative fuels such as LPG as substitute for fuel wood and charcoal by addressing the institutional and market constraints that hamper increasing access of LPG in Ghana
- Sustained public education and awareness creation on negative health impact of wood fuel smoke
- Greater collaboration among relevant Metropolitan, Municipal and District Assemblies (MMDAs), local authorities and traditional rulers

Biomass Policy Direction

Biofuel:

Provisions in the RE Act:

- 41. Feedstock Production – Upon attainment of a licence from the EC, relevant permits will have to be obtained from the Ministry of Food and Agriculture & the EPA

- 42. Designation and Pricing of Biofuel Blend –
 1. The Minister shall designate biofuel blend as a petroleum product

 2. NPA shall be responsible for the pricing of biofuel blend

Biomass Policy Direction

- 43. Sale of Biofuel Blend –
 1. NPA in consultation with the EC shall determine the proportion of biofuel in biofuel blend offered for sale from time to time
 2. Conspicuous display of proportion of biofuel contained in a biofuel blend at the point of sale.
- 44. Sustainability of Woodfuel Production - EC shall collaborate with the Forestry Commission, EPA, MMDAs and other relevant institutions to ensure the development and implementation of programmes to sustain woodfuel production and consumption.

Biomass Waste:

- A major strategy will be to vigorously promote the generation of useful energy from biomass waste.

Highlights of the Biomass Subsector

- Renewable Energy Act has been enacted which incorporates bioenergy and other renewable energy resources into the national energy mix.
- A draft Bioenergy Policy Strategy document has been developed and subjected to Strategic Environmental Assessment (SEA).
- A Licensing / Permitting Manual for the RE Industry has been developed.
- Biomass Resource Assessment focusing on Sawmill and Agro-processing waste has just been completed.

FIT Effective October 01, 2014

Electricity Generation Source	FIT (GHp/kWh)	FIT (US cents/kWh)
Biomass	56.0075	17.5100
Biomass (Enhanced Technology)	59.0350	18.4565
Biomass (Plantation as Feed Stock)	63.2891	19.7865

Conclusion

- Government recognizes the important role of biomass in the energy economy of the country considering the fact that **bioenergy is already an important source of energy for households.**
- The major challenge is the **inefficient mode of production, transformation and consumption.**
- To reach a sustainable energy mix, **it is crucial to modernize the traditional biomass sector** and develop modern bioenergy encompassing other sectors.
- The aim is to **use biomass to improve access to energy** at the household, commercial and industrial levels.

