

BIOMASS ENERGY

An alternative energy source

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GICC Gaborone

Presentation

By

B.R. Mabowe

Biomass Energy

- Woody biomass
 - Taken to mean fuelwood given that charcoal is insignificant in Botswana
- Wet biomass
 - Municipal sludge and animal waste (biogas)
- Energy crops
 - Tree and agricultural crops producing biofuels biodiesel, ethanol and derivatives i.e. ethanol gel fuel)
- Residues
 - Agricultural, forestry and urban waste, including primary residues (e.g. fallen trees, caged poultry waste) secondary residues (e.g. saw mill waste) and tertiary residues (e.g. municipal solid waste)

WHY Biofuels in Botswana

- Volatile oil prices have increased motivation
- Capacity to create rural employment
- Business opportunity for small-scale farmers
- Foreign exchange savings by government and eventually earn FOREX for the country
- lower emissions of greenhouse gasses
- Improve security of supply & ensure self sufficiency for the country
- Economic diversification

Policy regarding biofuels

- Draft Energy Policy
 - GoB has put an initiative for development of biofuels by including them in the BEMP 2004 and the Draft Energy Policy
- NDP 10
 - Implementation of a biodiesel project intended to produce 50 000 000 litres of biodiesel per annum by 2016
 - About 70 000 ha land will be required

Government initiatives

- **The installation and operation of a 50 million litre/year flexi biodiesel processing plant by 2016**
- **The development of a 20 000 ha jatropha plantation for feed-stock production**
- **Research and development**
 - Focus on the whole value chain from germplasm development through production to processing
 - Environ impacts, landuse modalities and conflicts, product sustainability, technological transfer and innovations, product marketability, product acceptability by the masses and socio-economic benefits associated with the product
 - Develop national guidelines for investment in biofuel production (09/10)

Are we getting there?

- Procuring a small 5 m litres /year processing plant
- Process of acquiring land from land authorities
- About to award a tender for national biofuels guidelines and study on the effects of jatropha farming on local farmers.

Biogas

- Gas produced when microbes digest biomass under oxygen free (anaerobic) environment.
 - Biogas is also produced in landfills and wetlands where large amounts of rotting vegetation may accumulate.
- On average the gas comprises of methane (CH_4) 67.5%, Carbon Dioxide (CO_2) 32% and other trace elements like Hydrogen Sulphate (H_2S) 0.5%, Nitrogen (N_2), Carbon Monoxide (CO).

Mabesekwa Biogas project

- Village is located in the Central District of Botswana, about 80km from the city of Francistown.
- 886 residents (CSO, 2004) who are primarily engaged in cattle rearing.
- All the cattle in this village drink at one point from 2 boreholes situated close to each other and about 2 km from the village settlement.
- The families rely on firewood for cooking and paraffin for lighting

Mabesekwa Biogas project

- **Purpose**

- The purpose of this project is to generate biogas for cooking and the Primary School and lighting of homestead in Mabesekwa village.

- **Objectives**

- To construct and run a biogas digester for cooking and lighting at Mabesekwa Primary School
- To set up biogas digester at Mabesekwa village for cooking and/or lighting
- To promote green energy and reduce greenhouse gas emissions
- To create jobs thus improving people's livelihoods
- To improve people and environmental health by provision of clean energy

Mabesekwa Biogas project-

Envisaged benefits

- Electricity supply to the village
- Improve the people's standard of living, welfare and health
- Replace the increasingly intensive use of firewood hence reduction in overharvesting of this resource
- Large scale biogas generators have a capacity to produce ethanol which can possibly be mixed with used cooking oil to create some form of biodiesel
- **As CO₂ from fossil fuels (paraffin/LPG) will be replaced and cattle dung managed to avoid CH₄ emissions into the atmosphere, this project activity will contribute to the reduction of greenhouse gases**
- Job opportunities for the people managing the project and for locals who will be involved in the construction of the system
- **By off-setting the use of firewood and paraffin and avoiding CH₄ emissions from cattle dung this project is expected to reduce significant amount of CO₂ emitted into the atmosphere per annum and this, through carbon market, can generate money for the government**

THANK YOU

FOR YOUR

ATTENTION