AGI ENERGY SERVICE CENTRE
Sustainable Energy for Profitability

HOW TO MAKE BIOGAS MORE COMPETITIVE IN GHANA

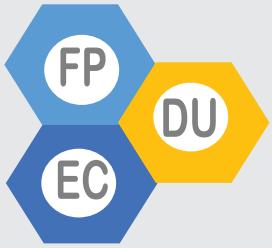
Biogas is a combination of methane, carbon dioxide and other impurity gases, derived from biomass that has undergone microbiological processes. The biomass sources include wastewater, manure, industrial and municipal waste, and crop waste. According to the International Renewable Energy Agency, biogas production represents a great opportunity for countries to address climate change while harnessing local economic benefits in the rural sector and tackling environmental challenges such as waste management.

One of the key barriers to biogas development in Ghana and many other sub-Saharan African countries is cost. While the capital cost is dependent on size and technology choice, operating costs are highly dependent on cost of feedstock (or substrates). Making biogas power more competitive in Ghana means finding ways to reduce costs of operation. The biggest challenge to reduce the costs for biogas plants are the substrates and their logistics/transportation costs.

The availability and cost of raw materials have a significant impact on the cost of biogas production. The production of biogas is therefore particularly interesting for, agro-industrial plants that can use their own residual materials that accumulate on the company premises. This not only results in a near-zero cost of transportation and reduced logistical challenges, but also allows the companies to use heat and electric energy produced from biogas to meet their own energy requirements.

Feedstock proximity
Biogas plant should be located as close to the feedstock as possible

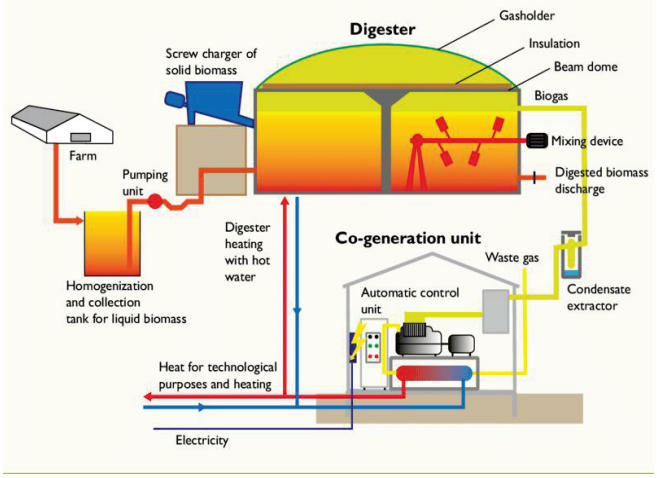
Explore Combined Heat Power (CHP)
Using biogas to generate heat only, or CHP improves competitiveness, compared to electricity only



Digestate utilization
Explore avenues to add value to digestate

01 Feedstock proximity

As much as possible, a biogas plant should be designed to utilize feedstock generated on site to avoid high logistical costs. Biogas plants located far from feedstock sources frequently incur more costs as they must transport feedstock resources from different parts. The plants may not receive tipping fees either, and rather pay for transportation. This affects substantially the competitiveness of the biogas plants. In some countries, waste-to-energy plants (which a biogas plant qualifies for) receive tipping fees from industries dumping waste at their premises, which helps the business case.



02 Explore CHP opportunities

Biogas plants should improve heat utilization using Combine Heat and Power (CHP) plants. One of the most profitable biogas plants in Ghana uses the entire biogas generated to produce heat for processing. Due to the higher efficiency in the utilization of biogas for heat production, the plant is highly competitive. For processing plants that utilize heat, using the biogas for only heat generation, or exploring heat production in addition to electricity will increase competitiveness, compared to using biogas for electricity only.

03 Value addition to digestate

Biogas plants should explore avenues to improve utilization of digestate as fertilizer. Most biogas plants explore the utilization of digestate on farms, especially where the facility has nucleus farms. An example is to upgrade the digestate into compost for fruit and vegetable cultivation. Another example is using digestate in oil palm plantations. For larger biogas plants, compost could also be sold for extra income.

For additional information on this opportunity, please contact:

AGI Association of Ghana Industries

german cooperation DEUTSCHE ZUSAMMENARBEIT

Implemented by: giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

+233 507 977 902
info.esc@agighana.org
www.esc.agighana.org
AGI Energy Service Centre
@agi_energy