

Potential of Biogas Production from Greywater and Faecal Sludge in the Accra Metropolis

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ABSTRACT

The production of biogas from greywater and faecal sludge through Anaerobic Digestion Technology (AD) is one of the most promising renewable energy sources in Ghana, as methane from these sources can be used in replacement for wood fuels and Liquified Petroleum Gas (LPG) in both heat and power generation. In this study, a feasibility analysis of the use of faecal sludge and greywater from households within the Accra Metropolis for biogas production was investigated. A survey carried out to assess the quantity of greywater generated by three different categories of communities revealed that the daily average greywater production was 100 *Lipid*, 98 *Lipid* and 99 with a return factor of 73%, 72% and 78% for the high, middle and low income groups. Physico- chemical analysis of faecal sludge and greywater also indicated the suitability of these substrates for biogas production. Based on the population (34,500) feeding the Legon Sewerage Treatment Plant on the assumption that every person produces 30 L (0.03 m³) of biogas daily, the amount of biogas produced from faecal sludge was estimated at 1,035 m³ per day. With the greywater, the high and low income groups tended to produce more biogas than the middle income when the materials were subjected to anaerobic digestion process. A cost-benefit "analysis was" conducted to assess the financial feasibility of installing a 9,000m³ capacity of a biogas digester (dome plant type) at the Legon Sewerage Treatment Plant with the option to be used for cooking or electricity generation. The results showed that the Net Present Value for both options were positive implying that both options were financially viable. The option to be used for cooking should be the first option since it had short payback period of five years.

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