Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Investigation of Palm Oil Mill Effluents Derived Biogas for Sustainable Energy Development in Nigeria

Godwin Odigie

Brandenburg Technical University, Environmental and Resource Management, Germany

Abstract

Electricity is one of the vital amenities needed in the development of any nation. Meaningful development in Nigeria is hindered by electricity situation, as electricity demands have exceeded supply. Biomass energy development in Nigeria could offer some prospect of local energy supply. Several biomass feedstocks such as oil palm are produced enormously in Nigeria. The effluent waste called palm oil mill effluents from the oil palm industry are discharged into the environment. The study evaluates the potential that bio waste such as POME generated from oil palm processing industries could have when converted to biogas energy and currency equivalent of potential energy loss from POME. This was analysed with primary data from a biogas plant of oil palm processing company. The flared biogas and its equivalent energy were analysed and compared with energy consumed by the host community. The result shows that 8.7 million kWh, 894 thousand kWh and 8.2 million kWh generated internally by the company biogas plant powered the SBB, TB, and for self-consumption respectively at a total cost of $830,000. This could have cost the company $765,650, $53,660 and $18022.5 annually if the energy was purchased by the State Electrical Distribution Company and more if the boilers were powered by fossil fuel petrol/diesel. The annual flared gas 8242746kWh surpassed the annual electricity demands of the host community 182299kWh when compared. POME Biogas could meet electricity challenges in Nigeria when developed. More research should be done on derivation of biogas from POME in Nigeria as practised in Malaysia.

Keywords: Biogas, electricity, oil palm, palm oil mill effluent

Contact Address: Godwin Odigie, Brandenburg Technical University, Environmental and Resource Management, Rostocker Str. 12, 03046 Cottbus, Germany, e-mail: godwin.odigie@yahoo.com