

## UTILIZATION OF PALM EMPTY FRUIT BUNCH (PEFB) AS SOLID FUEL FOR STEAM BOILER

**Y. P. Olisa**

Department of Mechanical Engineering,  
Niger Delta University, Wilberforce Island  
Bayelsa State, **NIGERIA**

&

**K.W. Kotingo**

Department of Mechanical Engineering,  
Niger Delta University, Wilberforce Island  
Bayelsa State, **NIGERIA**

### ABSTRACT

The reclamation of energy from the by-product of palm fresh fruit bunch (PFFB) after processing into palm oil can be seen as an alternative to fossil fuel. This study therefore examined the utilization of empty fruit bunch (EFB) as an alternative fuel for firing a steam turbine plant for the production of electricity. The power plant used for this study produces 1.5 MW of electricity by burning EFB at the rate of 840 Kg per hour, given the same rate of combustion, this value was compared to a conventional power plant fired with methane gas which produces 4.35 MW. In Nigeria the economic cost of producing this magnitude of electricity by methane gas is estimated at about two thousand dollars per hour (\$2,000/hr). On the other hand it cost virtually nothing or little amount to procure EFB which is seen as a waste by small scale oil Plantation Companies, the only cost incurred probably comes from transportation of the material, thus making the use of EFB very economical as an alternative fuel for firing a boiler plant.

**Keywords:** Biomass, Energy, Boiler, Electricity.