

ABSTRACT

STUDY PERFORMANCE BIOGAS GENERATOR 750 WATT CAPACITY WITH FUEL BIOGAS FROM WASTE PALM OIL

By

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The use of energy is more increasing, either the usage of direct energy or the converting energy into other forms of energy. Projections of electricity needs in 2003-2020 were conducted by a System Planning Department PT PLN (Persero). Moreover, Energy Team BPPT increases in demand at 6.50% per annum. Biogas is a mixture of gases produced by methanogenic bacteria which occur in materials and can be naturally decomposed in the anaerobic state. Biogas is generally composed of 50.00-60.00% methane (CH₄), 30.00-40.00% carbon dioxide (CO₂), hydrogen (H₂) and a small percent of gases 1.00-2.00%. Potential oil palm of Agro Industry waste is as a raw material biogas. It is approximated 13,761,239 tons per year of fresh fruit bunches which produced from 4,868,086 hectares. Biogas can be converted into electrical energy by using biogas generators. The purpose of this research is to know the potential of biogas from palm oil waste and biogas of generator works. Wet fermentation process of biogas production was raw materials POME by a feed rate of 150 liters POME per day. Dry fermentation production was a raw materials TKKS by 4 digesters which contains 20 kg of TKKS. The biogas production from wet fermentation is about 1, 91 m³ per day and dry fermentation is about 0.11 m³ per day. The biogas which was produced by both process contains 56, 48% of methane. The amount of H₂S is decreased up to 96, 94% by using bio filter and the result of biogas with amount of H₂S is as big as 12, 91 ppm. The works of biogas generator was good enough which was seen by the use of specific biogas is about 0, 62 liters per watt per hour at load of 700 watt. More than that, the term essential was effective is about 30, 00% at load of 600 watt.

Keywords: Biogas, palm oil mill waste, biogas generators, POME, EFB