

ABSTRACT

Usage and utilization of biomass waste such as palm shells one of which can be done by converting palm shells into energy producer gas through the gasification process. The producer gas is used as a substitute fuel for diesel engines-generators for the production of household electricity in the area around the plant. From the consumer's needs, then the producer gas plant designed capacity of 3,000 tons / year.

Biomass Gasification is a chemical reaction at a temperature of 800 - 1200 ° C between the biomass with penggasifikasi media by 20% - 30% of the required stoichiometric combustion. The gasification process produces a gas producer and a small content of solid particles, ash and tar. Gas producers will be fuel for diesel engines-generators for electricity production and supply the electricity needs of the local area which is not got electricity grid for places difficult to reach. The process steps include the preparation of raw materials palm shells and air, the formation of producer gas in a fixed bed gasifier types of down-draft, producer gas purification, and the introduction of gas into diesel engine-generator set. Purification of producer gas made up the tar content of not more than 50-100 mg / Nm³, ash content up to 50 mg / Nm³, the size of the dust is not more than 10 µm, and a gas temperature below 40 oC that does not diminish the performance and life of diesel engine-generator set.

The factory is planned to stand adjacent to the PT. Agrical Sebelat Village area, District Putri Hijau, North Bengkulu and built on a land area of 400 m² and side by side with diesel as the main generator of electricity providers and communities with energy supply from gas producers. The factory operates 24 hours per day and 330 days per year with a workforce of 0.05 manhour / Nm³ products. Utility requirements include ground water as much as 10.06 kg / Nm³ products, electricity 0,09 kWh / Nm³ products.

The shape of the company is CV (limited partnership) with line and staff organizational structure. Systems based on the division of employees working hours of employees shift and non-shift. The factory is planned to start construction in early 2017 and be operational in early 2018 with the plant life of 10 years. Plant fixed capital of Rp. 849 922 368, - and the total production cost of Rp. 544, - / Nm³ products. The feasibility analysis shows that the ROI before tax after tax 45.42% and 34.06%. POT 1 year before tax of 1.8 years and 2.27 years after tax, BEP 43.47%, 32.04% and DCF SDP amounted to 32.33%. Based on the parameters above, the plant is worth considering for the realization of its development.

Keyword : Palm Shell, Downdraft *Gasifier*, Producer Gas

LEMBAR PERSEMBAHAN DAN MOTTO

**“Sesungguhnya sholatku, ibadahku, hidupku, dan matiku
hanya untuk Allah SWT semata”**

