**Abstract**

Waste from agriculture such as banana hump is increasing time by time. Waste banana hump have a high caloric is 3.196,29 Kal/g. Same as sludge PT.SIER and low density polyethylene (LDPE) plastic. Both of wastes have high energy content of 2.252,76 Kal/g and 11.095,24 Kal/g. Based on this energy content, three of this substance can be use an alternative fuel material such as eco-briquette. The purpose in this research is investigated the best composition and characteristic of eco-briquette and from the emission aspect its eco-friendly.

In this research, eco-briquette made by mixing banana hump, sludge and LDPE plastic, with eco-briquette composition. The adhesive used tapioca powder. The parameter measured from this research were moisture, volatile solid value, ash content, caloric value, compressive strength, emission and financial analysis.

Research from experiment show type K1, with composition of 32% LDPE plastic, 48% sludge, and 20% of carbonated banana hump, has past energy content is 3.904,14 Kal/g. How ever based on all of the type composition C2, with composition 40% LDPE plastic and 60% of carbonated sludge, have the highest value energy content is 4.495,82 Kal/g. The characteristic of emission show K1 has a lower emissions compare than that C2 eco-briquette. Type K1 is still below the standard of Permen ESDM No. 047 Tahun 2006. The financial analyses show that increasing the energy content value will increase the price of energy value. Analysis financial show K1 has Rp 0,72 per kkal and Rp 2.811,- per kg.

**Keyword:** eco-briquette, sludge of PT. SIER, plastic LDPE, banana hump