

# BIOKONVERSI SAMPAH PASAR MENJADI BIOGAS MENGGUNAKAN STARTER TERMOFIL DARI SUMBER AIR PANAS PACET

## BIOCONVERSION OF GARBAGE MARKET BECOME BIOGAS BY USING THERMOPHILE STARTER FROM PACET HOT SPRING



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The effort to convert of market garbage become biogas can be used to solve limited energy resources and to decrease garbage hoarding. Generally, conventional biogas production just used microorganism from organic garbage, without to effort for increase the quality and kind of microorganism which have roles.

The aims of this research are to make thermophile starter cultures to produce biogas in a simple reactor at small scale with vegetables as a garbage model, to determine optimum temperature, and to applicate a simple biodigester to convert the market garbage become biogas in bigger scale.

Starter cultures of this research is a microbe mixture from Pacet hot spring, East Java that cultivated on homogeneous garbage model medium. Optimization has been done by making temperature variation at 40°C, 50°C, and 60°C.

The result shown that thermophile microbe can be used as starter to produce biogas. At 60°C temperature was the optimum condition of biogas production, with total biogas  $1281 \pm 56.8$  mL from 200 gram garbage. Bioconversion of 3 kg market garbage taken from Keputran market, Surabaya on random condition, by 300 gram thermophile starter addition, which TS (total solid) 9.55%; C/N 18.96%; pH 7.48; could produce 4108.5 mL and 6320 mL biogas on 3 weeks anaerobe fermentation process (measured from volume of water which moved).

Whereas bioconversion of 3.3 kg garbage without starter on the same condition, which TS (total solid) 9.82%; C/N 19.26%; pH 7.56; could produce 2436 mL and 4278 mL biogas. Bioconversion of market garbage by starter addition can produce more biogas than bioconversion of market garbage without starter addition.