

## **ABSTRACT**

*One form of renewable energy is biomass, biomass obtained from organic matter and usually a waste product. Biomass have a high potential to be developed. From this material, can produced some gases such as hydrogen. Hydrogen has the highest combustion heat and clean energy because the combustion produces only water vapor.*

*The methods used in this research is anaerobic fermentation. This process does not use the additional bacteria, or enzymes, just do pre-treatment stage with warm up the substrate for 15 minutes. During this process the temperature will be kept constant with mesophilic condition in 25°C, 28°C, 31°C, 34°C, and 37°C. The reactor used in this research is a digester anaerobic made from glass with dimensions high 23 cm, diameter 8.5 cm and a volume of substrates 1.4 liters.*

*Results of research showed that the highest levels of hydrogen gas produced 47% on the second day for the substrate of banana peel. When the temperature of substrate kept constant at 25 °C.*

*Keywords: biomass, hydrogen, fermentation, anaerobic digester.*