

# In Searching of Biomass Resource for Gasification in Indonesia

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## Abstract

Biomass is one of the promising resource for self-sustaining energy development in Indonesia. With its location in tropical region and as islands country, Biomass, with its abundant diversity, grows very well in Indonesia. On the contrary, knowledge of our biomass resource still has limitation. In order to harvest energy through biomass, first we have to know its calorific values as basis for energy transformation. In the previous paper, Kaliandra wood had been research as newly proposed biomass resource and its combustion properties had been identified. In this research, Kaliandra wood, Albasia wood and Coconut shell chip are gasified and identified its gas properties using Gas Chromatographer. Thus, this resulted synthetic gas of several biomass resources are tested in a gas engine so as to know its capability to deliver energy. As the result, Coconut Shell chip has the highest gas calorific value of 26.827, 36 kCal/kg of Net Heating Value. Kaliandra wood and Albasia wood chip gives gas calorific value of 3632,09 kCal/kg and 4267,36 kCal/kg of Net Heating Value. The contain of Hydrogen (H<sub>2</sub>) of coconut Shell also reveal the highest value which correlates with its gas calorific value. The H<sub>2</sub> and CO contain of coconut shell are 93.39 %mol and 1,24 %mol. The contain of H<sub>2</sub> in Albasia wood is 12,49 %mol with CO contain 13,01 %mol. It is interesting that the contain of H<sub>2</sub> and Co in Kaliandra wood is 21,41% mol and 9,89%mol, it is in the middle between coconut shell and albasia wood. Simulation of its energy price in form of electricity using gasification technology reveals the Levelised Cost of Electricity (LCOE) of 19,49.cent USD/kWh for gasification using coconut shell, 23,6 cent USD/kWh for gasification using albasia wood and 21,98 cent USD/kWh for gasification using Kaliandra wood.



Fig. 1. Gasification Reactor and Gas Engine