

## A Study of Solid Waste Generation in Residential College UNIMAS West Campus as Potential Renewable Energy

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### Abstract

*Solid waste management has become a critical issue faced by Malaysia due to the country's rapid development, both in population and economic. The same goes to the tertiary education institutions, which also faced by Universiti Malaysia Sarawak, (UNIMAS). UNIMAS is a hostel provided campus, where the human traffic is considerably high. Everyday large amount of solid waste are produced by the residents of UNIMAS. Statistic data and percentage of solid waste produced by UNIMAS residents according to type have never been investigated. Therefore this study provides an insight of this kind of data for the purpose of future development in UNIMAS solid waste management. The type of solid waste produced by Residential College UNIMAS West Campus and its percentages and volume produced are discussed focusing on the solid waste that have potential energy value and recyclable materials. The data in terms of percentage and approximate amount of volume was applied in the calculation of the potential energy of the solid waste recovery according to the types. The result shows that the total potential amount of energy from solid waste produced by Residential College UNIMAS West campus could reach up to 14027.19 kJ/kg where the highest value that is 22.64% of energy content was contributed by Tun Ahmad Zaidi College.*

**Keywords:** *Solid Waste, Energy, Renewable Energy, Residential College, UNIMAS*

### 1. Introduction

Rapid economic development, growth in population, change in life style, inadequate infrastructure and expertise, and land scarcity make the management of solid waste become one of Malaysia's most critical environmental issues. Production of waste through the consumer products is the highest. Due to development, our education system has been improved followed by an increasing in the growth population in campus as well. In Universiti Malaysia Sarawak (UNIMAS) itself the student intake for the year 2012 reaches 4,939 people, among the highest student intake in Malaysia. UNIMAS currently has some 12,000 students while its full capacity is 20,000 [1]. Solid waste is one of the largest amounts of waste produced in campus where the current method of disposal is managed by Trienekens Sdn Bhd in which the final step is either landfilling or incineration.

Solid wastes are classified on the basis of source of generation and type. The source of solid wastes has been consistent, dependent on sectors and activities [2]. Existing solid waste expenditure levels increased in Malaysia in line with the pattern of economic standard of living and consumption rate [3]. There are many types of solid waste where paper and cardboard form the second biggest component of domestic waste after organic waste, and contribute about 13% of the total domestic solid waste. Besides, glass accounts for 2.5% by weight of the total solid waste generated. Meanwhile with

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