MAKERERE UNIVERSITY

MEDICAL SOLID WASTE INCINERATION EFFECTIVENESS AND ENERGY RECOVERY POSSIBILITIES: CASE STUDY OF MEDICAL SOLID WASTE IN KAMPALA HEALTH UNITS – UGANDA

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Abstract

Uganda has of recent experienced increased waste production due to high population growth, socio-economic development, changing household consumption patterns and distribution channels. In particular, there has been an enormous increase of quantities and diversity of waste materials generated within Kampala City. One stream of this waste, namely medical solid waste, which includes highly infectious waste, dry and biodegradable waste, has not received sufficient attention. Its potentially harmful effects on the general environment and public health, lead to an urgent need for scientific disposal mechanisms.

This research sought to examine medical solid waste incineration effectiveness, focusing on quantities of waste generated, disposal methods, medical waste characteristics, energy potential and recovery; a case of Kampala City. Fourteen health units were surveyed and the research revealed that medical solid waste produced ranged between 3 to 5,000 kg per day; only six hospitals used incinerators and eight either used traditional methods like open burning or employed a private company to deliver their waste to incineration points. Additionally, non-segregation of waste was observed; and some incinerators produced dark smoke implying existence of high levels of carbon monoxide, which put human health and the environment at risk. Similarly, success of medical waste incineration remained realistic only if well-equipped and trained personnel to manage waste existed. Despite heat production during incineration of medical solid waste, no efforts were being engaged to ensure energy recovery irrespective of the obvious advantages of doing so. In line with that, ***MAK V*** incinerator was the most suitable to modify for energy recovery, and it's possible to recover energy from incinerator waste heat.

This study recommends that Ministry of Energy and Mineral Development with Ministry of Health devise mechanisms to recover energy from medical solid waste so as to supplement the inadequate energy in the country, create a legal framework for the safe disposal of medical waste, enforce standards for any health unit to operate, ensure that all incinerators for heat energy recovery are installed with accurate control of air inflow which is so essential to boiler efficiency, emphasize behavior change through awareness creation and dialogue and ensure proper integrated management, priority setting and infrastructure development.