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Resource Recovery through RDF: Current Trends in Solid Waste Management in the Philippines

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Abstract

Solid waste management has always been about collection and disposal of garbage. We have currently moved on to a more efficient collection and disposal by using Engineered Sanitary Landfills in the Philippines. However, with the increase in population and the consequent increase in solid waste generation, we are now running out of spaces to establish solid waste disposal facilities. A global trend in solid waste management is towards resource recovery rather than disposal of waste. Resource recovery is no longer limited to recyclable materials such as tins, glass, paper, plastic and rubber. Resource recovery now involves the recovery of all solid waste materials, including residual waste. This is the value of RDF or refuse-derived fuel. RDF uses highly combustible residual waste, such as plastics and some biodegradable materials as fuel for cement kilns.It is currently being used by giant cement manufacturers Holcim and La Farge, consisting about 10% of the fuel they use in their cement kilns, which still uses an estimated 90% coal.

The use of RDF, however, as a waste-to-energy technology must still be closely monitored under RA 9003 or the Ecological Solid Waste Management Act 2000 as well as the Clean Air Act. It remains to be an incinerating technology that requires equipment for flue gascleaning system to prevent air pollution. If RDF can be maintained as a clean technology and recovery of RDF-qualified waste materials can be increased, resource recovery from solid waste will become more efficient, then someday, we will finally be able to achieve zero waste.

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1. Introduction

Solid waste management is among the most significant challenges being faced by the world today. The rapid increase in population all over the world brings about too much consumerism and overproduction of materials due to a perceived demand and other factors. Amid all these, we leave behind all sorts of solid waste that degrades our natural environment.

In the Philippines, where the population has already exceeded 100 million in 2015, and an average solid waste generation rate of 0.5 kg per capita per day, it can be estimated that an average of 50,000 MT per day is being generated, of which, 35,000 MT/day are collected (Gilbert and Ramos, 2012). The rest end up in places other than the designated disposal facilities. In Metro Manila alone, where the estimated rate of daily solid waste generation is pegged at 0.7 kg per capita, this metropolis generates an estimated amount of 8,345 MT daily plus an estimated amount of 55 MT per day of healthcare waste (Gilbert and Ramos, 2012). Even with a national policy on solid waste management (Republic Act 9003), the state of solid waste is such that the local chief executives seem to be at a loss on how to deal with it on a daily basis. The traditional method of door-to-door collection and hauling to the final disposal facility can no longer be sustained. Modern solid waste management requires more than daily collection and disposal.

It is a gargantuan task which must be carefully planned, implemented, and enforced in a sustainable manner so that more materials can be recovered.

There are three technical options in treating municipal solid waste, incineration, landfill and most recently, RDF - refuse-derived fuel. Landfill is the most acceptable option in the Philippines as a means for final disposal since incineration is already banned under RA 9003 because of the toxic emissions coming out from such facilities. More recently, the use of RDF as a means to divert portions of municipal solid waste is being used, albeit to a limited extent. RDF is largely used by international cement manufacturers operating in the Philippines such as Holcim and La Farge, as well as by Cemex.

This paper deals with the state of solid waste management in the Philippines and RDF as a viable option for resource recovery, showing available and accepted technology currently used in managing solid waste. This paper also highlights the best practice of a partnership of companies in dealing and treating solid waste using RDF.

2. Review of Literature

Since this paper is a product of practical implementation of municipal solid waste management and not an academic research, desktop review of electronic reference sources have been conducted. There is a large volume of literature regarding RDF and solid waste management over the internet, including news on RDF plants being planned, constructed or being launchedin the Philippines. However, there are not many scientific papers that deal with studies on RDF, and only a few are academic papers.

In the Philippines, there has been no scientific or academic studies conducted regarding this technology since this is a relatively new technology here. Most of the literature available are blogs from the websites of service providers. Several of these have been perused since they were helpful in understanding RDF and some are used as references for this paper. Most of these references explain RDF as a process, some extolling the benefits of this waste management option. For example, some are found from news sources, describing the use
of RDF in an area by cement manufacturer such as that of Sabillo (2013), concerning the use of RDF by La Farge, in Payatas landfill. A report by Foth and Van Dyke (2001) for the Ramsey/Washington Counties Resource Recovery Project on the comparison of potential electricity production from RDF and LPG mentions that it takes 11 tons of RDF to power one household for a year, which needs 14 tons of MSW in comparison to 750 tons of MSW to produce LFG which, when converted into electricity, could provide enough electricity to power one home for 20 years.