

The Tenth International Conference on Waste Management and Technology (ICWMT)

Research on the sorting reclaim system of municipal solid waste based on the concept of "cradle to cradle"

Wei Liu^{*}, Sha Liu, Guan Huang

Chengdu University of Information Technology, Chengdu 610225, China

Abstract

In recent years, the output of municipal solid waste (MSW) in China has been increased by 10% annually, and the traditional disposal methods, such as sanitary landfill, incineration and compost, will produce secondary pollution. In order to deal with the current predicament which presents a large number of MSW discharged, and cities are besieged by garbage, so promoting MSW sorting reclaim is very important, it can transform "waste" into new resource. China has launched some pilot projects to sort and reclaim MSW in some cities since 2000, but with little success. Firstly, the existing problems in the disposal of MSW have been summarized, then the management system of MSW sorting reclaim has been constructed according to the experience of foreign countries. At the same time, the concept of "Cradle to Cradle" which compose of MSW delivery (waste classification, design of garbage bag, collection time and design of garbage can), and utilization of MSW (different loops are designed for different wastes). Finally, the countermeasures and suggestions of promoting MSW sorting reclaim are proposed. The results have significant value for constructing "resource-conserving & environmental-friendly" society and guiding MSW sorting reclaim in China.

© 2016 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of Tsinghua University/ Basel Convention Regional Centre for Asia and the Pacific

Keywords: municipal solid waste; sorting reclaim; cradle to cradle; management system

1. Introduction

China's economy has grown rapidly since reform and opening up policy. With the improvement of living standards and cities large-scale development of Chinese cities, the output of MSW goes up with growth a rate of

^{*} Corresponding author. Tel.: +86-028-85966941; fax: +86-028-85966941.
E-mail address: weling9@163.com

10% each year, the phenomenon of “Garbage-surrounded City” draws public’s attention to the issue of sorting reclaim MSW in cities. In recent years, the management of MSW in developed countries is based on the principle of Recycle, Reuse and Reduce. The foreign level of sorting and reclaim MSW is higher and more detailed, it mainly relates to the higher economic level, the cultural quality of residents, the capital investment of government, the related policy, and the construction of supporting facilities in foreign countries. The total of MSW in big or middle city of China is 161,488,100 tons in 2014^[1], however, at present, the processing power of MSW is only about 50%, and the proportion of the harmless disposal that meets treatment standards is only 20%. The main treatments are landfill, incineration and composting.

The thinking of comprehensive management in foreign MSW disposal has been affirmed, which is shown in two general forms like widespread popularizing sorting reclaim and levying waste disposal fee. Nowadays, it pursues the goal of MSW disposal based on reduction, harmless, resource utilization^[2]. Currently^[3], laws relating to management of waste in Germany are about 800, and the administrative regulations are up to 5000. The new waste management ideas were determined by law, and performed MSW disposal with the principle of marketization and industrialization. In Germany, MSW disposal is considered to be a very lucrative business. After experiencing a series of problems of severe environmental pollution, and oil crisis, Japan give energetic support to environmental protection and energy-saving technologies, and their MSW disposal is at the forefront of the world. Firstly Japan^[4] established a complete legal system, it not only had the refinement of classifications but also reduced MSW at the outside by the way of befitting throw MSW. Secondly, Japan attaches much importance to propaganda and education. Children are educated by parents and schools about proper MSW disposal since childhood. Environmental supervising management teaches residents the knowledge of circular economy and popularizes environmental protection consciousness. And government grant the rules which is accurate to every family, everyone about MSW disposal in time.

2. The Disposal Status of MSW in China

2.1 The retrospective analysis of MSW in China

The situation of MSW in China from 2000 to 2013 is shown in Fig.1. The rate of harmless disposal presents overall upward trend and the annual growth rate is 7.78%. The amount of MSW delivering quantity in 2013 reaches to 172,385,800 tons and the rate of harmless disposal is 89.3 %. Harmless disposal in China, as shown in Fig.2, landfill is the main method to dispose MSW in most city, and the proportion of sanitary landfill capacity is much greater than composting and incineration.

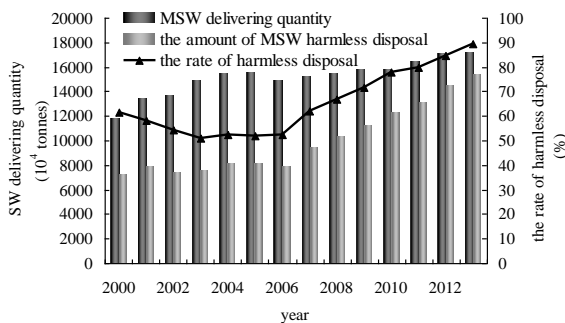


Fig.1. The situation of MSW in China from 2000 to 2013

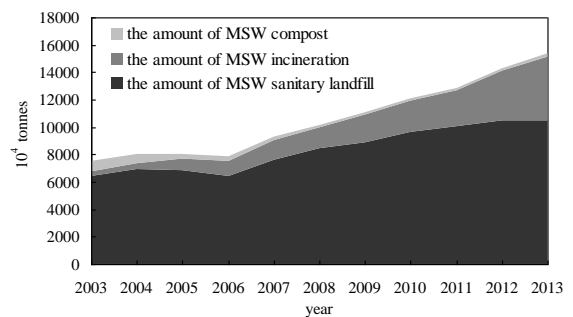


Fig.2. Harmless disposal of MSW in China from 2003 to 2013

Sanitary landfill has a competitive advantages of mature technology, simple operation and management, large capacity, etc., but it will take a lot of land resources, and the misconduct of leachate will pollute the surrounding water and soil, the gases produced in landfill such as methane will aggravate the greenhouse effect and are both fire and explosion hazards. Incineration is increasing year by year, the heat generating during incineration is used to generate electricity and heat for the use of combustible garbage and characteristics of high calorific value.

Download English Version:

<https://daneshyari.com/en/article/4401575>

Download Persian Version:

<https://daneshyari.com/article/4401575>

[Daneshyari.com](https://daneshyari.com)