

Chapter 4

Municipal Solid Waste Management and Treatment in China

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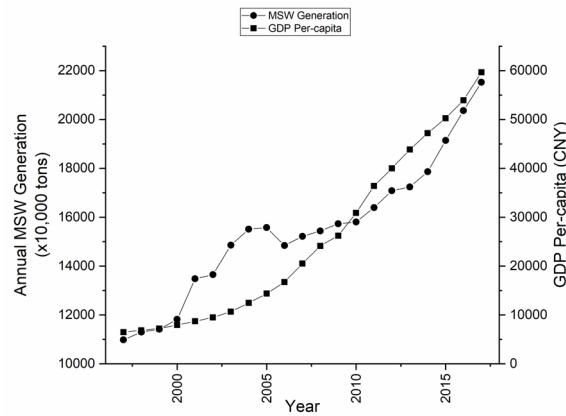
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ABSTRACT

This chapter focuses on the generation, treatment, and management policy, but excluding reduction and recycling information, of municipal solid waste (MSW) in China. Cities in China generated 215 million tons of MSW in 2017. It presents a big challenge for sustainable development of cities. Currently, sanitary landfill is the dominant method for MSW treatment, treating 57.2% of total waste. MSW composting has seen a decrease in application, only used to treat less than 2.5% of total MSW. Meanwhile, waste to energy in the form of incineration for energy production has developed significantly in the last decade. The percentage of MSW amount treated by incineration is 40.2% from the total amount of treated MSW in 2017, a sharp increase from only 4.9% in 2003, due to China's commitment to WtE. The content of this chapter shall include comprehensive data from government and industry, including plant capacity, quantity, technology, emission, policy and regulation promoting, and guiding WtE in China.

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Figure 1. MSW generation and GDP growth in China (1979 - 2017)



MSW GENERATION AND COMPOSITION

Municipal solid waste (MSW) in China is generated from household and commercial activities for providing goods and services, including offices and shopping malls; but excluding the waste from hospital, industry and construction. MSW sorting is still not currently well operated in China, and the Chinese government is recently struggling to promote waste sorting. This result in MSW that consist of various components mixed together, making the composition complex and the amount large. These create a huge challenge on efforts on recycling or reutilization of MSW in China.

MSW Generation in China

According to China Statistical Yearbook (NBSC, 2018), the total population of China in 2017 is 1.39 billion. 813.47 million of it is citizen, accounting for 58.52% of total population. Due to urbanization development in China, the population in urban area has quickly increased, creating population concentrations in major cities. The economic development has also been significant in the last 40 years, with gross domestic product (GDP) increasing from CNY 41.01 billion (6.12 billion USD) in 1979 to CNY 8271.22 billion (1233.33 billion USD) in 2017 (NBSC, 2018). Both of increasing citizen population and GDP are expected to cause more MSW to be produced in cities. Reviewing the MSW annual generation data as shown in Figure 1, the amount increased from 25.08 million ton in 1979 to 215.2 million ton in 2017 (NBSC, 2018). This is an average increase of 6.06% per year.

Analyzing the correlation between citizen population and GDP to MSW generation as presented in figure 1 (NBSC, 2018), it was calculated that China's MSW generation per-capita was 0.725 kg/person/day and 26.02 kg/CNY 10,000 GDP nationally in 2017. China's MSW generation per-capita is lower compared to other developed countries such as USA (2.01 kg) and Japan (0.96 kg). MSW generations per 10,000 RMB GDP for the two countries are 20.6 kg (USA) and 14.9 kg (Japan), respectively. MSW generation per 10,000 GDP is an index used by the Chinese government to measure and promote sustainable development. MSW management system tied to economic model has been well applied in Japan, and China is developing plans of the same model.

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