



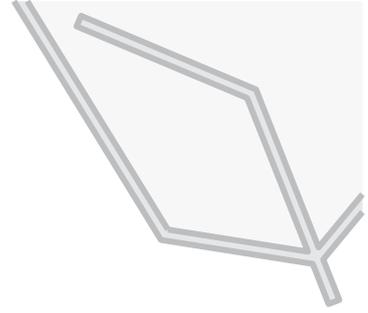
THEMATIC REPORT 15

China Municipal Solid Waste Management Industry

Edited by China-Italy Chamber of Commerce



Camera di Commercio Italiana in Cina
中国意大利商会
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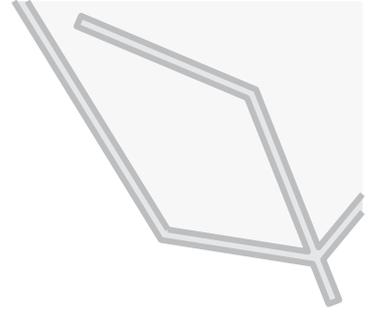


TABLE OF CONTENTS

1 Definition of China Municipal Solid Waste (MSW) Management Industry	4
1.1. Definition of China Waste Management Industry	4
1.2. Definition of China Municipal Solid Waste.....	4
2. Supervision Environment of the MSW Industry	5
2.1. Administration System of the MSW Industry.....	5
2.2. Major Policies of the MSW Industry.....	6
2.2.1. Waste Classification	6
2.2.2. Waste Disposal.....	7
3. Waste Management System and Practices	9
3.1. Analysis on Supply in China Water Treatment Membrane Industry.....	9
3.2. Current Treatment Method & Existing Treatment Capacities per Waste Stream	9
3.2.1 Kitchen Waste	9
3.2.2 Waste Paper	9
3.2.3. Scrap Metal	10
4. Competitive Landscape in the MSW Industry	11

1 Definition of China Municipal Solid Waste (MSW) Management Industry

1.1. Definition of China Waste Management Industry

China's solid waste is mainly divided into four categories: municipal solid waste (MSW), construction waste, industrial waste and agricultural waste. In 2018, the total solid waste volume was about 11,238 million tons.

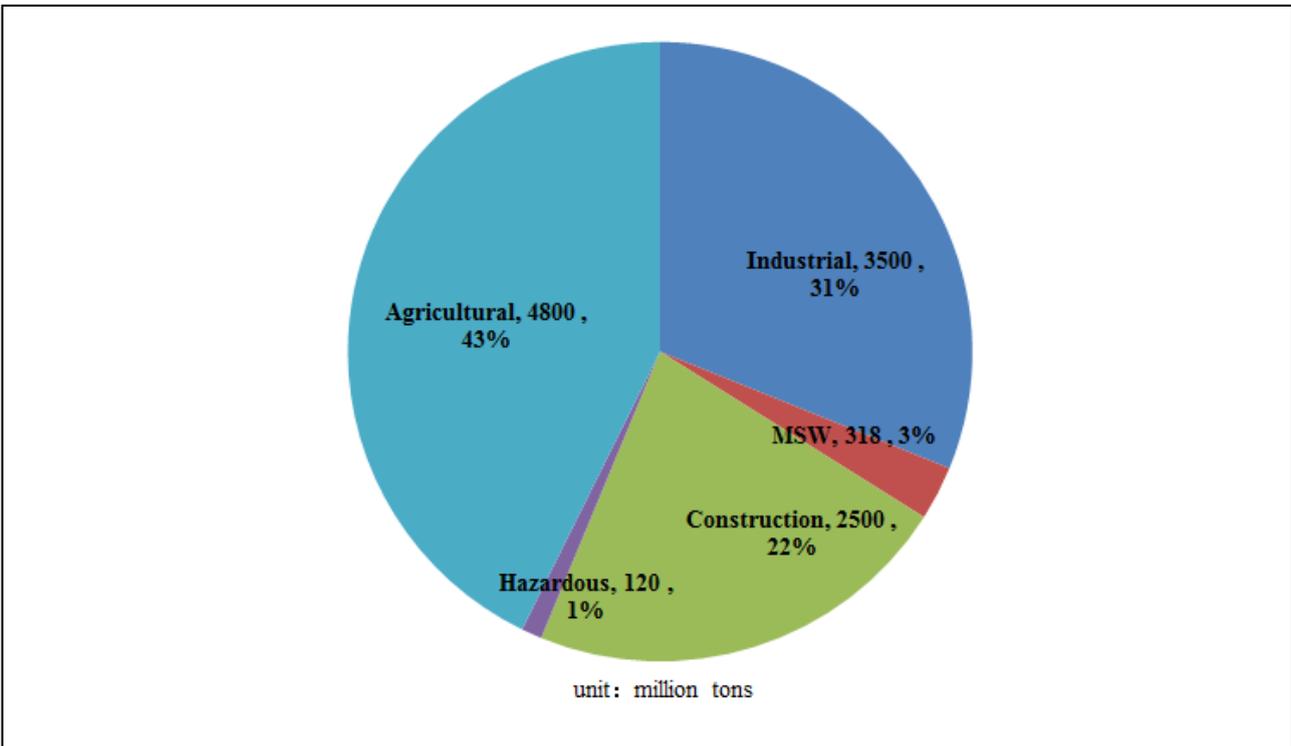


Figure 1 China's solid waste volume (2018). Industrial waste does not include hazardous waste.
Data source: GEP Research.

1.2. Definition of China Municipal Solid Waste

Municipal solid waste refers to solid waste generated in urban daily life or from activities that provide daily services. It also refers to solid waste considered as domestic waste by laws and regulations, mainly including residential domestic waste, commercial waste, and market trade waste. It also includes the waste collected from the street, public places, government agencies, schools, factories and mines, etc. (industrial solid waste and special waste such as hazardous solid waste excluded).

The government officially counts the amount of collected waste. It is calculated as the initially compressed weight of the waste after entering waste transfer stations.

2. Supervision Environment of the MSW Industry

2.1. Administration System of the MSW Industry

At present, mainly the Ministry of Housing and Urban-Rural Development, the Ministry of Environmental Protection, the Ministry of Science and Technology, the Ministry of Finance, and other departments, lead the management of domestic waste in China. They have different functions and conduct supervision in coordination. At local level, the Ministry of Housing and Urban-Rural Development and local Environmental Protection Department are responsible for the specific management of domestic waste. The local Housing and Urban-Rural Development departments are responsible for cleaning, transportation, and disposal of domestic waste. They also manage the related facilities. The environmental protection departments are responsible for pollution prevention and dealing with the processing of solid waste treatment.

Institution	Responsibilities
Ministry of Housing and Urban-Rural Development	It is responsible for the management of the urban domestic waste treatment industry, lead an inter-ministerial joint conference for urban domestic waste treatment, and coordinate and resolve major issues in the work.
Ministry of Environmental Protection	It is responsible for environmental impact assessment of domestic waste treatment facilities, formulating pollution control standards, supervising pollutant discharge and hazardous waste treatment and disposal.
National Development and Reform Commission	It prepares a national plan and coordinates comprehensive policies works with the Ministry of Housing and Urban-Rural Development and the Ministry of Environmental Protection.
Ministry of Science and Technology	It is responsible for technical innovation of domestic waste treatment in conjunction with relevant departments.
Ministry of Industry and Information Technology	It is responsible for the independent development on domestic waste treatment equipment.
Ministry of Finance	It is responsible for researching fiscal and taxation policies that support the disposal of municipal solid waste.
Ministry of Land and Resources	It is responsible for formulating land use standards for domestic waste treatment facilities and ensuring the supply of construction land.
Ministry of Agriculture	It is responsible for the formulation of standards for the treatment and utilization of domestic waste fertilizers and the registration of fertilizers.
Ministry of Commerce	It is responsible for recycling management of renewable resources in domestic waste.

*Table 1 Management department and responsibilities of domestic waste industry.
Data source: GEP Research.*

2.2. Major Policies of the MSW Industry

2.2.1. Waste Classification

Since 2000, China has carried out waste sorting and collection pilot projects in cities such as Beijing and Shanghai, but it has not achieved significant results. The release of *the Implementation Scheme for the Domestic Waste Classification System* in 2017 made waste classification mandatory. In April 2019, the Ministry of Housing and Construction officially issued a document that formalized the tasks and timetable of the first group of cities. Many cities across the country have gradually implemented the mandatory waste classification.

According to the requirements of *the Notice on Comprehensively Carrying Out Domestic Waste Classification Work in Cities at and above Prefecture Level*, jointly issued by the Ministry of Housing and Urban-Rural Development, the National Development and Reform Commission, and the Ministry of Ecology and Environment in April 2019, the mandatory classification of waste is promoted in 46 key cities.

Region	City				
Municipalities	Shanghai	Beijing	Chongqing	Tianjin	-
Cities specifically designated in the state plan	Shenzhen	Xiamen	Qingdao	Ningbo	Dalian
The first group of domestic waste demonstration cities selected by the Ministry of Housing and Urban-Rural Development	Handan	Tongling	Tai'an	Guangyuan	Rikaze
	Suzhou	Yichuan	Yichang	Deyang	Xianyang
Provincial capital cities	Hangzhou	Nanjing	Changsha	Shenyang	Changchun
	Chengdu	Wuhan	Zhengzhou	Lanzhou	Hefei
	Guangzhou	Xi'an	Jinan	Taiyuan	Harbin
	Shijiazhuang	Kunming	Yinchuan	Haikou	Hohhot
	Fuzhou	Nanning	Nanchang	Guiyang	Xining
	Lhasa	Urumqi	-	-	-

Table 2 China's key cities for waste classification and promotion.

Data source: Notice on Comprehensively Carrying Out Domestic Waste Classification Work in Cities at and Above Prefecture Level.

Shanghai is the first city in China to fully implement the classification of domestic waste. In 2019, the second session of the Shanghai Municipal People's Congress passed the Shanghai municipal regulation on the management of domestic waste, integrating waste classification into the development framework of Shanghai.

Main Contents of Municipal Solid Waste sorting in Shanghai	
Sorting standards	Implement the "four classifications" standard: hazardous waste, recyclables, wet waste, dry waste.
Fines	A maximum of RMB 200 fine can be imposed upon individuals if they drop mixed waste. A maximum of RMB 50,000 can be imposed upon enterprises for mixed waste transportation.
Waste charging system	According to the principle of "who generates and pays," gradually establish charging by quantity and pricing by classification.

Table 3 Main Contents of Municipal Solid Waste sorting in Shanghai.
Data source: Regulations on the Management of Domestic Waste of Shanghai Municipality.

2.2.2. Waste Disposal

Waste disposal in China mainly includes sanitary landfilling, incineration and other disposal systems, accounting for 55%, 45%, and 5%, respectively. Incineration disposal rates are increasing year by year, while landfilling is gradually decreasing. The 13th Five-Year Plan proposed to reach more than 50% of the city’s municipal solid waste incineration treatment capacity by 2020. More than 60% of the city’s municipal solid waste incineration treatment capacity will be in the eastern region. Municipalities, planned cities and provincial capitals with conditions will achieve “zero landfilling” of waste.

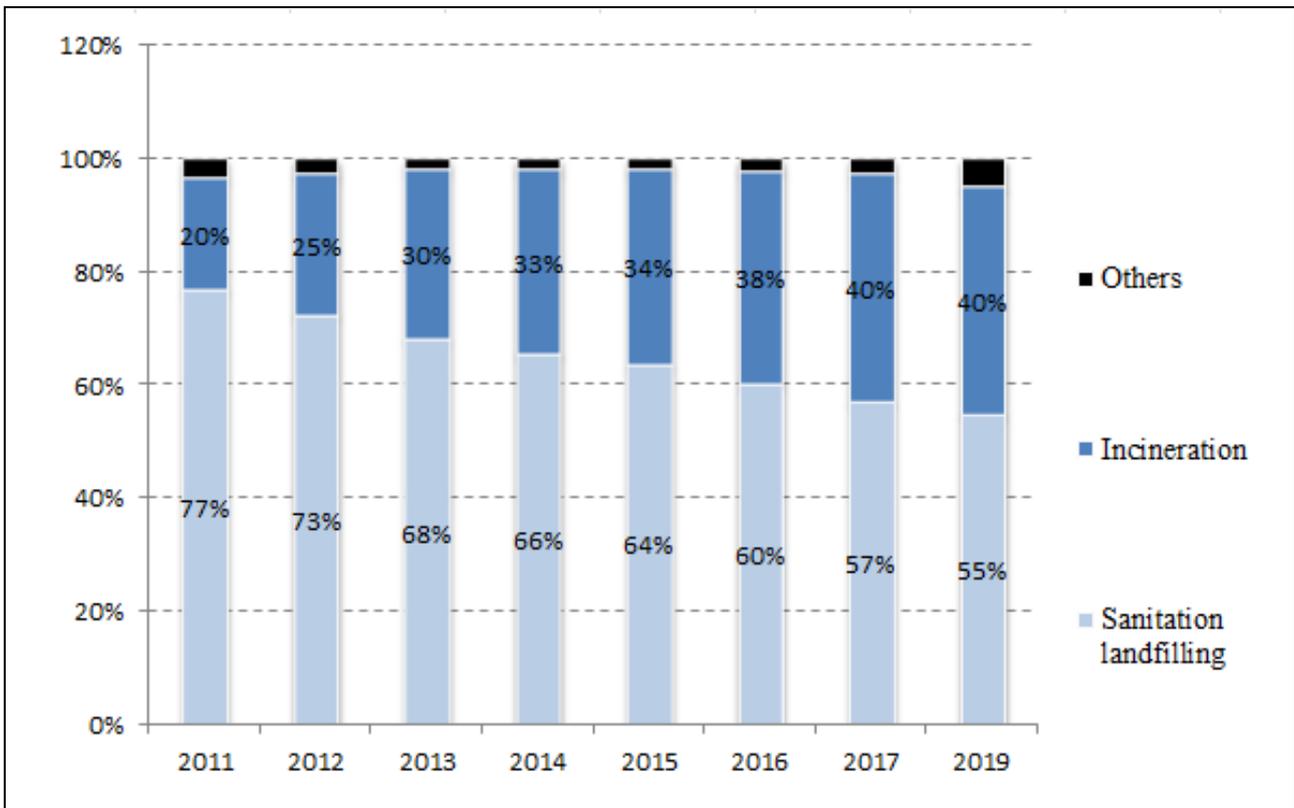
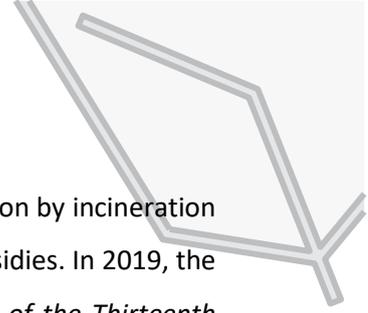


Figure 2 Structure of Municipal Solid Waste Treatment Methods.
Data source: GEP Research, Statistical yearbook of urban and rural construction.

It is expected that the subsidy for incineration power generation will gradually decrease in the future. Power generation by domestic waste incineration is an important disposal direction for urban solid waste



treatment and resource utilization. During the 13th Five-Year Plan period, power generation by incineration developed rapidly under the promotion of national policies and fixed electricity price subsidies. In 2019, the Ministry of Finance's response to the *No. 8443 recommendation of the Second Session of the Thirteenth National People's Congress* was as follows: “Considering the low efficiency of waste incineration power generation and poor ecological benefits, the proportion of new projects included in the scope of subsidies will be gradually reduced. Market-based methods such as waste disposal fees in support of waste incineration power generation industry will be encouraged.”

3. Waste Management System and Practices

3.1. Analysis on Supply in China Water Treatment Membrane Industry

According to GEP Research data, China produced approximately 320 million tons of MSW in 2018, including 110 million tons of kitchen waste, 70 million tons of waste paper, 30 million tons of waste plastic, 20 million tons of waste metal, and 15 million tons of waste glass.

	Kitchen waste	Waste paper	Waste plastic	Waste glass	Waste metal	Waste battery	Other	Total
Regular channels (processing)	9000	2127	2052	725	478	-	8420	22802
Unconventional channels (recycling)	2000	3971	900	720	1500	2	0	9093
Total municipal solid waste	11000	6098	2952	1445	1978	2	8420	31895
Proportion	34%	19%	9%	5%	6%	0%	26%	100%

Table 4 Composting and recycling channels of MSW in China in 2018 (10000 tons).
Data source: GEP Research.

3.2. Current Treatment Method & Existing Treatment Capacities per Waste Stream

3.2.1 Kitchen Waste

In municipal waste structure, kitchen waste accounts for about 50%. In 2018, China produced approximately 110 million tons of kitchen waste, and the processing industry market size was worth approximately RMB 12.8 billion, with a year-on-year increase of 2.4%. It is estimated that kitchen waste in China will reach about 130 million tons in 2025, and the processing industry market size will grow to RMB 15.2 billion, with a compound annual growth rate of about 2.5%.

Market scale of China's kitchen waste treatment industry is composed of two parts, the engineering investment market of kitchen waste and the operation market of kitchen waste treatment. In 2018, the scale of operation market was approximately RMB 10.9 billion (accounting for approximately 85%), while the investment market size was about RMB 1.9 billion (accounting for about 15%).

3.2.2 Waste Paper

In 2018, about 71 million tons of waste paper were produced in China. About 70% of the total amount was recycled with a recycling volume of nearly 50 million tons. More than 21 million tons of waste paper was sent to a waste treatment plant as urban domestic waste, where most are incinerated as combustibles.

In terms of recycling channels, domestic waste paper (from residential areas, etc.) accounts for 50%, and commercial waste paper (from supermarkets, shopping malls, etc.) accounts for 30%. This two kinds of

waste paper are mainly collected by scavengers and recycling companies. Industrial waste paper from industrial sources (from printing and packaging plants) account for about 20%.

3.2.3. Scrap Metal

In 2018, China's domestic scrap metal recycling volume was about 223 million tons, and its import volume was 0.05 million tons. The total amount of scrap metal accounted for about 230 million tons. In terms of recovered materials, scrap metal is mainly used as scrap steel, with an annual recovery of more than 210 million tons, accounting for more than 95% of the total. In terms of recycling channels, industrial sources are the mainstay, as industrial source channels account for more than 90%. The development of the scrap metal recycling industry is affected by many factors, for example by the low demand of non-ferrous metal and steel excessive capacity.

4. Competitive Landscape in the MSW Industry

The China's waste treatment industry is relatively mature and the market is highly concentrated. In 2018, the total processing capacity of the top three companies (CR3) accounted for 30%, while the CR10 accounted for 60%.

China's waste treatment and disposal industry has a large amount of investment and a high threshold. Today there are less than a hundred enterprises. Most of the companies in the industry are state-owned or state-owned key enterprises. The proportion of private enterprises has declined, as from 2017 to 2018 the market share of state-owned enterprises rose from 65% to 78%.

Waste treatment and disposal enterprises mainly focus on incineration power generation. As few national policies support landfilling, there are fewer enterprises working in this field.

The gross profit level of companies in the domestic waste treatment industry is around 40%, and the interval is mainly distributed between 30% and 50%.



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The high-level training program Sicab – Sino Italian Capacity Building for Environmental Protection is supported by IMELS – ITALIAN MINISTRY FOR THE ENVIRONMENT, LAND AND SEA.



Sicab is included within the SINO-ITALIAN COOPERATION PROGRAM FOR ENVIRONMENTAL PROTECTION (SICP). SICP was launched by IMELS – the Italian Ministry for the Environment, Land and Sea and MEE – the Chinese Ministry of Ecology and Environment.

Sicab consortium includes five partners: Politecnico di Milano (Lead Partner), Euro-Mediterranean Center on Climate Change, Italy China Foundation, Fondazione Politecnico di Milano, Sapienza University of Rome.



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