

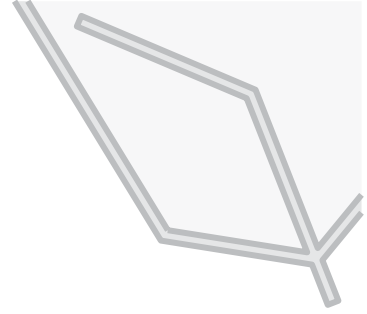
THEMATIC REPORT 11

China Landfill Industry

Edited by China-Italy Chamber of Commerce



Camera di Commercio Italiana in Cina
中国意大利商会
China-Italy Chamber of Commerce



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1. Analysis of the Policy Environment for the Landfill Industry in China

1.1. Policy Analysis of the Landfill Industry in China

In recent years, the “reduction, recycling and harmlessness” level of domestic waste treatment has gradually increased in China. Landfill is the last step in the domestic waste disposal chain. Relevant policies have been promulgated continuously, while the landfill industry is undergoing standardized development.

The 13th Five-Year National Plan for the Construction of Harmless Treatment Facilities for Domestic Wastes in Towns and Cities proposed to implement the sanitary landfill treatment technology all over the country, as a final disposal method of domestic wastes and a necessary guarantee means. The sanitary landfill treatment technology is mainly employed for the landfill of incineration residues and fly ashes that meet the exemption conditions as well as other emergency uses. The remaining storage capacity should meet the requirements for waste incineration residues and domestic waste landfill treatment in the corresponding area for more than 10 years. The plan did not encourage the construction of incineration disposal facilities with a processing capacity of less than 300 tons per day and landfill facilities with a storage capacity of less than 500,000 m³. *The Opinions on Further Strengthening the Incineration and Disposal of Urban Domestic Wastes* proposed that by the end of 2020 the waste incineration and disposal capacity in cities all over the country would account for more than 50% of the total disposal capacity. It indirectly indicated that by the end of 2020 the domestic waste landfills in cities nationwide would still have to bear a share of nearly 50%.

Serial No.	Time	Policy Name	Institution	Main Content
1	2017	<i>Implementation Plan for Domestic Waste Classification System</i>	National Development and Reform Commission and the Ministry of Housing and Urban-Rural Development	The plan aims to accelerate to establish the waste disposal system for classified throwing, classified collection, classified transportation and classified disposal; to make overall plans for the construction of terminal treatment and utilization facilities for domestic wastes; and to actively explore to establish the domestic garbage co-processing and utilization base that integrate wastes incineration, kitchen waste resource utilization, renewable resource recycling, landfill and hazardous waste disposal.
2	2016	<i>The 13th Five-Year National Plan for the Construction of Harmless Treatment Facilities for Domestic Wastes in Towns and Cities (Fagaihuanzi [2016] No. 2851)</i>	National Development and Reform Commission and the Ministry of Housing and Urban-Rural Development	By the end of 2020, the harmless treatment rate of domestic waste is planned to reach 100% in municipalities directly under the Central Government, in municipalities with independent planning status and in provincial capitals (built-up areas). The harmless treatment rate of domestic wastes in other cities is planned to be above 95%.
3	2016	<i>The 13th Five-Year Plan for Biomass Energy Development (Guonengxinneng [2016] No. 291)</i>	National Energy Administration	The plan aims to develop biogas power in line with local conditions; to build landfill gas power generation project based on the layout of urban landfill site; to build or rebuild biogas power generation project based on the construction of large-scale rural biogas projects; to actively promote the barrier-free access of biogas power generation into urban and rural distribution networks and grid-connected operation. By 2020, the installed capacity of biogas power generation would reach 500,000 kW.
4	2015	<i>Notice on Printing and Distributing the Catalogue of Preferential Value-Added Tax for Resources Comprehensive Utilization Products and Labor Services (Caishui [2015] No. 78)</i>	Ministry of Finance, State Taxation Administration	Taxpayers who sell self-produced products for comprehensive utilization of resources and provide services for comprehensive utilization of resources (hereinafter referred to as sales of products and services for comprehensive utilization of resources) may enjoy the immediate VAT levying and refunding policies. Wastes and biogases produced by waste fermentation fall into the scope of the catalogue.
5	2013	<i>Guidance Catalogue for Industrial Structure Adjustment (2011 Edition) (Amendment) (Fagailing [2013] No. 21)</i>	National Development and Reform Commission	The projects regarding the reduction, resource utilization, harmless treatment and comprehensive utilization of town wastes and other solid waste are classified as encouraged industries.

6	2005	<i>Guidance Catalogue for the Development of the Renewable Energy Industry (Fakainengyuan [2005] No. 2517)</i>	National Development and Reform Commission	Power generation through waste incineration and landfill biogases are commercialized.
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Table 1 Summary of the Policies on Domestic Waste Landfill in China.

Data source: GEP Research.

1.2. Relevant Technical Specifications for the Landfill Industry in China

At present, the technical specifications for landfills in China mainly focus on sanitary landfill technology, landfill operation and closure, landfill pollution control, and other aspects.

Serial No.	Time	Standard Name	Institution
1	2017	<i>Technical Specifications for the Closure of Domestic Waste Sanitary Landfill Sites (GB51220-2017)</i>	Ministry of Housing and Urban-Rural Development
2	2013	<i>Technical Specifications for the Sanitary Landfill and Disposal of Domestic Waste (GB50869-2013)</i>	Ministry of Housing and Urban-Rural Development
3	2011	<i>Technical Specifications for the Operation and Maintenance of Domestic Waste Sanitary Landfill Sites (CJJ93-2011)</i>	Ministry of Housing and Urban-Rural Development
5	2010	<i>Construction Standards for the Closure Engineering Projects of Domestic Waste Landfill Sites (Jianbiao [2010] No. 146)</i>	Ministry of Housing and Urban-Rural Development and the National Development and Reform Commission
4	2009	<i>Technical Specifications for the Landfill Gases Collection, Treatment and Utilization Projects of Domestic Waste Landfill Sites (CJJ133-2009)</i>	Ministry of Housing and Urban-Rural Development
5	2009	<i>Construction Standards for Domestic Waste Sanitary Landfill Treatment Engineering Projects (Jianbiao [2009] No. 151)</i>	Ministry of Housing and Urban-Rural Development and the National Development and Reform Commission
6	2008	<i>Pollution Control Standards for Domestic Waste Landfill Sites (GB16889-2008)</i>	Ministry of Environmental Protection and the General Administration of Quality Supervision, Inspection and Quarantine of the PRC
7	2005	<i>Standards for the Harmless Evaluation of Domestic Waste Landfill Sites (CJJ/T107-2005)</i>	Ministry of Construction
8	2005	<i>Land Use Index for the Construction of Municipal Domestic Waste Treatment and Water Supply and Sewage Treatment Projects (Jianbiao [2005] No. 157)</i>	Ministry of Construction, Ministry of Land and Resources

Table 2 Technical Standards and Specifications for the Landfill Disposal of Domestic Wastes.
Data source: GEP Research.

1.3. Sanitary Landfill Site

Sanitary landfills of livelihood garbage should be located outside the urban planning area. They are also required to meet flood control requirements, to be in stable geological conditions, in low population density areas, to have positive transportation conditions, convenient soil extraction, and low land and groundwater use value. In underground mining areas and in areas that affect urban safety, the distance from rural residential areas and water supply points for humans and animals should not be less than 0.5



km.

A new sanitary landfill of livelihood waste should not be located in the upper direction of a dominant development area. The land boundary should not be less than 5 km far from a planned built-up area with a population of 200,000 or more, and it should not be less than 2 km far from a built-up area with a population of less than 200,000 people.

A greening isolation belt has to be set along the boundary of the land for the domestic waste sanitary landfill. It needs to have a width of no less than 10 m. The protective green belt with a width of no less than 100 m should be set around the outer edge.

The life span of the domestic garbage sanitary landfill should not be less than 10 years.

2. Development Status of the Landfill Industry in China

2.1. Current Number of Landfills and Utilization of Available Landfill Capacity

In recent years, the number of new landfill sites in China has been stable, while the number of closed sites has increased rapidly. The landfill capacity has entered a contraction cycle. According to China's 13th Five-Year Plan, by 2020, the landfill capacity will be about 477,100 tons per day, down by 5% from 501,500 tons per day in 2015.

In 2018, there were 663 waste sanitary landfills in China, with a sanitary landfill volume of 117 million tons per year and a capacity utilization rate of approximately 86%. It is expected that the sanitary landfill volume will continue to decline in the future.

	2014	2015	2016	2017	2018	2019E	2020E
The number of sanitary landfill sites	604	640	657	654	663	660	650
Sanitary Landfill Capacity (million tons / year)	122	126	128	132	136	138	136
Sanitary Landfill Treatment Volume (million tons / year)	107	115	119	120	117	114	111
Rate of production utilization	88%	91%	93%	91%	86%	83%	82%

*Table 3 Number and Capacity of Waste Landfills in China.
Data source: National Bureau of Statistics.*

2.2. Analysis of the Status Quo of Sanitary Landfill Areas

In 2018 among the total 663 waste sanitary landfill sites in China, 44.2%, 32.9%, and 22.9% were respectively distributed in the eastern, central and western regions. Because of the population increase, the economic development, and other factors, the domestic wastes produced in the eastern region are comparably more than that in the central and western regions. The proportion of landfill waste accounts for 49% of total waste disposal in the eastern region, while the proportion of landfill in the central and western regions respectively accounts for 71% and 68%.

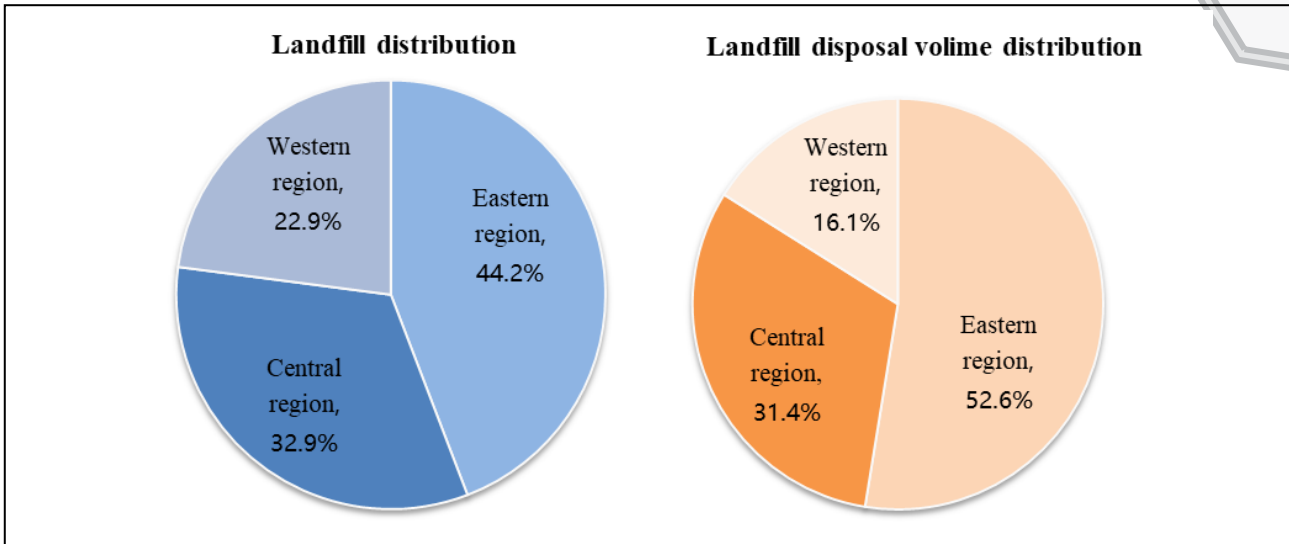


Figure 1 Comparison of Landfills and Treatment Volumes Distribution in China. The distribution ratio of landfill and disposal volume is equal to the landfill and disposal volume by region divided by the national waste disposal volume. The total is then multiplied by 100%.

Data source: GEP Research.

2.3. Disposal Methods

Waste disposal in China mainly includes sanitary landfill, incineration and others, accounting for 55%, 45%, and 5%, respectively. Incineration disposal rates are increasing year by year, while landfill proportions are decreasing. The 13th Five-Year Plan proposed that by 2020, municipalities, planned cities, and provincial capitals with conditions would achieve “zero landfill” of waste.

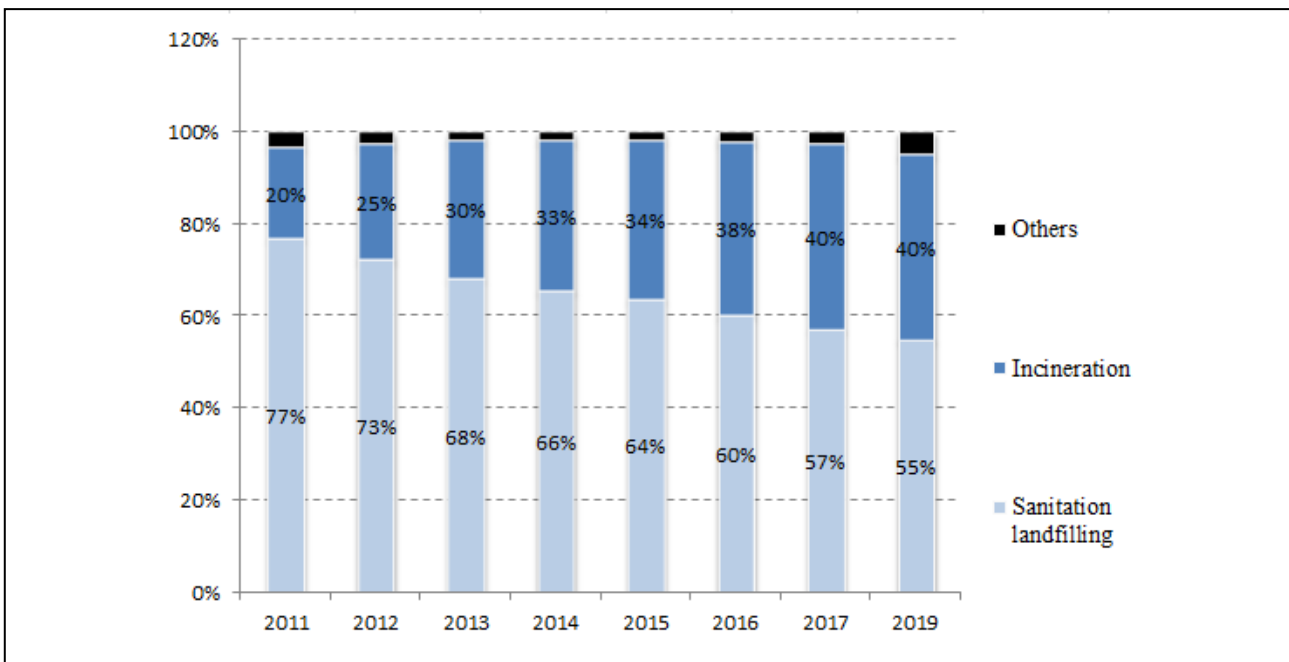
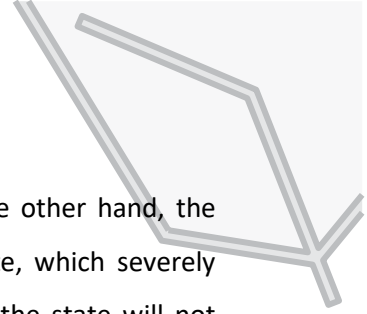


Figure 2 Structure of Municipal Solid Waste Treatment Methods.

Data source: statistical yearbook of urban and rural construction.

Landfill disposal is still the most important method of urban domestic waste disposal in China. However, the proportion of total landfill volume in the total harmless disposal volume keeps diminishing. On one hand, the decline is due to the fact that incineration is increasingly supported by the state, as it is a disposal



method with the characteristics of "harmlessness", "reduction" and "recycling". On the other hand, the adoption of landfill method would occupy a large amount of land with low reuse rate, which severely consumes land resources and causes serious pollution to groundwater. In the future, the state will not support the development of new landfills, while it will consider the comprehensive management of existing landfills and closure of fully filled landfills as priorities.

3. Demand Analysis and Prospect Forecast of the Landfill Industry in China

In 2018, 220 million tons of wastes were collected and transported to the waste treatment plant in garbage bins. Among them, about 120 million tons of wastes were processed by landfills, accounting for about 55% of the total. Based on the guidance of the national waste disposal policies, the waste sanitary landfill volume has been decreasing year by year since 2017. As a consequence, the growth rate of waste landfill and disposal volume has declined. It underwent negative growth in 2018 (-2.8%). It is expected that the domestic waste sanitary landfill and disposal volume would be about 110 million tons.

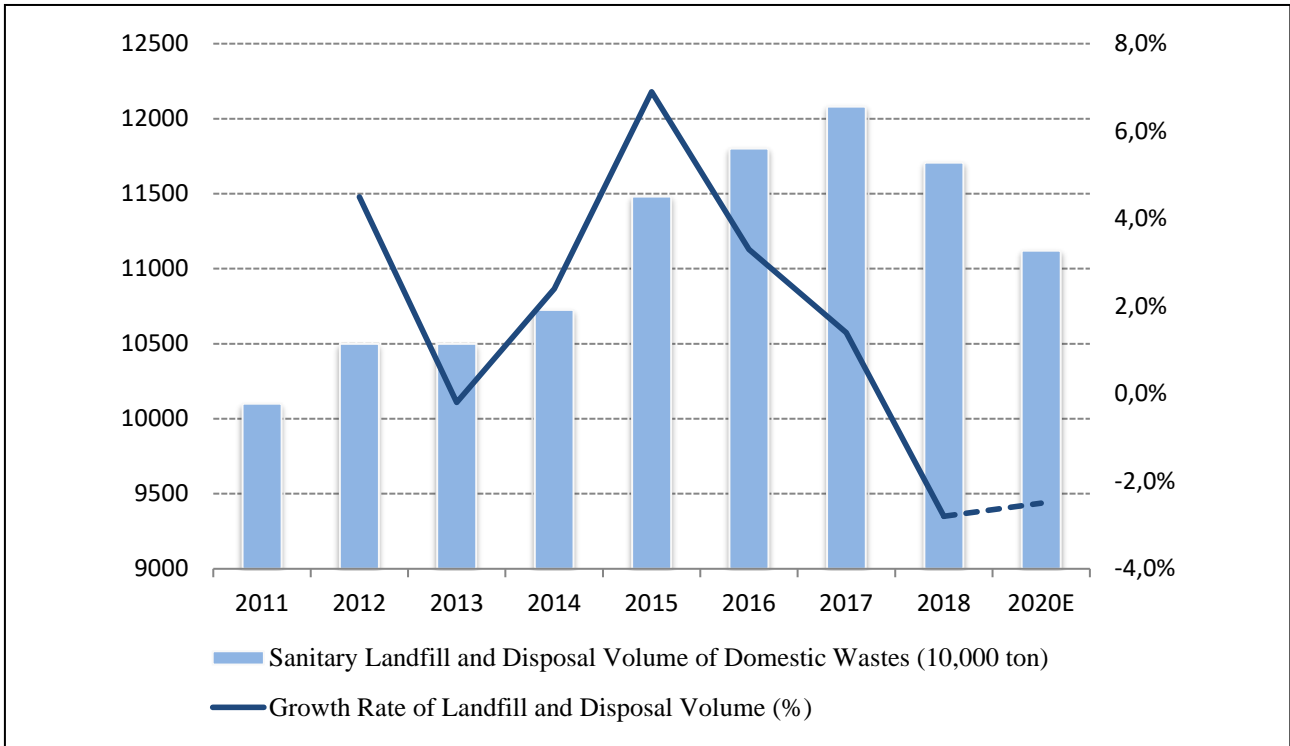


Figure 3 2011-2020 Domestic Waste Sanitary Landfill Disposal Volume and Forecast in China.
Data source: GEP Research, National Bureau of Statistics.

According to GEP Research, the market demand scale of sanitary landfills of domestic waste was worth about RMB 9.4 billion in 2018. It would reach about RMB 8.9 billion by 2020. The landfills in China have entered a contraction cycle, and the landfill industry would keep a slowly decline trend.

4. Analysis of the Supply and Competition in the Landfill Industry in China

4.1. Supply Status of the Landfill Industry in China

The ownership and operating entities of landfills could be divided into government and enterprises. In general, the government operates the majority of landfills, but some local governments has allowed third-party enterprises to operate landfills. At present, the investment, construction, and operation of landfill treatment facilities have gradually shifted from a government-led pattern to a market-oriented pattern. As landfills do not fall in the development directions encouraged by national policies, few enterprises are active in this industry.

4.2. Competitive Analysis of the Landfill Industry in China

Most of the enterprises in the landfill industry in China are comprehensive environmental protection enterprises. The businesses in the domestic waste treatment sector mainly focus on waste incineration. Landfill-related businesses (including the construction and operation of landfills, the treatment of landfill leachate, etc.) as supporting services mostly focus on providing landfill sites for waste incineration ashes.

The competition among these supply enterprises has mainly concentrated in three major markets including landfill construction and operation, leachate treatment facilities and power generation through landfill gas. In all landfill projects the proportion of construction and operation led by PPP model has gradually increased, accounting for about 40% of the total number of projects. Leachate treatment enterprises could provide integrated services for leachate treatment projects, while the buried gas power generation enterprises are mainly concentrated in the equipment and engineering markets.

Serial No.	Company Name
1	Beijing GeoEnviron Engineering & Technology, Inc
2	CECEP DADI Environmental Remediation Co., Ltd.
3	Shanghai Environment Group Co., Ltd.
4	Beijing Shouchuang Environmental Technology Co., Ltd.
5	Foshan Veolia Landfill Treatment Co., Ltd.

*Table 4 List of Several Treatment Enterprises in the Landfill Industry.
Data source: GEP Research.*



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E DELLA TUTELA DEL TERRITORIO E DEL MARE

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