



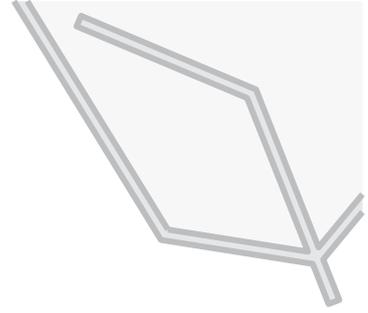
THEMATIC REPORT 02

China Industrial Wastewater Treatment Industry

Edited by China-Italy Chamber of Commerce



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中国意大利商会
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1. Environmental Impact Analysis Concerning China's Industrial Wastewater Treatment Industry

1.1 Analysis of the Influence of Macro Environment on Industrial Wastewater Treatment Industry

The development of industrial wastewater treatment industry has been closely related to the industrialization process and industrial scale in China. Therefore, the development status of the macro-economy has a significant influence on the industrial wastewater treatment industry. Overall, in 2018, China experienced a declining growth rate of infrastructure investment, a reduced prospective on investment in new infrastructure, a fallen growth rate of prospective investment in manufacturing industry, a slacken growth of corporate profits, and a business setback. As a consequence of the downward pressures brought about by macroeconomic internal and external uncertainties, it is expected that the downstream demand of industry sectors in the industrial wastewater treatment industry will maintain a steady slowdown development trend in 2019.

1.2. Analysis of Industrial Policy, Law and Regulation Environment

1.2.1. Industrial Policies

In recent years, the Chinese government has successively released a number of policies to guide water pollution prevention and control. In particular, since the release of the *10-Chapter Water Pollution Prevention and Control Action Plan* in April 2015, the industry-related policies have been intensively introduced, which provided a good external policy environment for the industrial wastewater treatment industry. Under the background of environmental protection inspection, industrial enterprises and industrial parks have experienced a transformation from passive pollution control to positive pollution control. To solve the industrial wastewater problems, especially the substandard industrial wastewater treatment in industrial parks, the Ministry of Ecology and Environment issued *the Notice on the Implementation of the Comprehensive Standardized Discharge Plan for Industrial Pollution Sources* in December 2016, and *the Promotion Program for Water Pollution Control Tasks in Industry Gathering Areas* in September 2017, which improved the industrial pollution control system, and formed an anti-driving trend towards industrial pollution.

1.2.2. Pollution Discharge Permit

The reform of the pollution discharge permit system marks one of the major changes in the environmental management system. At the end of 2016, China took the lead in carrying out pollution discharge permit management works in the thermal power and paper industries. By the end of June 2017, almost all thermal power plants in China obtained pollution discharge permits. In 2019, the Ministry of Ecology and Environment issued *the Classification Management Catalogue of Pollution Discharge Permits for Fixed Pollution Sources*, which regulated the issuance schedule of pollution discharge permits for 37 major categories and 109 industry categories, as well as the applicable industrial technical specifications for

pollution discharge permits.

Time	Institution	Document
November 2016	General Office of the State Council	<i>The Implementation Plan for Pollution Discharge Permit Control System</i>
December 2016	The Ministry of Ecology and Environment	<i>The Interim Provisions on the Administration of Pollution Discharge Permit</i>
June 2017	The Ministry of Ecology and Environment	<i>The Classification Management Catalogue of Pollution Discharge Permits for Fixed Pollution. Sources (2017 Edition)</i>
December 2017	The Ministry of Ecology and Environment	<i>The Key Review Points for the Approval and Issuance of Pollution Discharge Permit in Seven Industries</i>
December 2017	The Ministry of Ecology and Environment	<i>The Regulations on the Administration of the Key Pollution Discharge Units Catalogue (Trial)</i>
January 2018	The Ministry of Ecology and Environment	<i>The Administration Measures for Pollution Discharge Permit (Trial)</i>
March 2018	The Ministry of Ecology and Environment	<i>The General Regulations on Environmental Management Ledgers and Pollution Discharge Permit Implementation Report Technical Specifications for Pollution Discharge Units (Trial) Issued by</i>
July 2019	The Ministry of Ecology and Environment	<i>Classification Management Catalogue of Pollution Discharge Permits for Fixed Pollution Sources (Draft for Comments)</i>

Table 1 The Relevant Policies on Pollution Discharge Permits Released in China.
Data source: GEP Research.

1.2.3. Price Policies

Prior to the end of 2016, the municipal sewage treatment charging standard should have been adjusted to be no less than RMB 1.4 per ton for non-residents, and the county and key towns sewage treatment charging standard should have been adjusted to be RMB 1.2 per ton for non-residents. Those who had reached the minimum charging standards but had not yet compensated for the costs and had been reasonably profitable should have further enhanced the sewage treatment charging standards in light of the pollution prevention and control situation.

In July 2018, the National Development and Reform Commission issued *the Opinions on Innovating and Improving the Price Mechanism for Promoting Green Development*. The document proposed to establish a charging mechanism aligned with sewage treatment standards. It also proposed to support the raise of sewage treatment standards, so that cities, towns and industrial parks that had raised sewage treatment discharge standard to Grade I Level A or more stringent standards could raise their sewage treatment charging standards accordingly. The relevant provinces in the Yangtze River Economic Belt should take the

lead in implementation. In addition, pollution discharge enterprises should also pay environmental protection taxes.

Time	Institution	Policy Name
2002	Former State Planning Commission, Ministry of Construction and State Environmental Protection Administration	<i>Notice on Implementing the Industrialization Development of Urban Sewage and Waste Treatment</i>
January 2015	Ministry of Finance, Development and Reform Commission and Ministry of Housing and Urban-Rural Development	<i>Administrative Measures on Collection and Use of Sewage Treatment Fees</i>
January 2015	National Development and Reform Commission, Ministry of Finance and Ministry of Housing and Urban-Rural Development	<i>Notice on the Relevant Issues Concerning the Formulation and Adjustment of Sewage Treatment Charge Standards</i>
December 2016	Standing Committee of the National People's Congress	<i>The Environmental Protection Tax Law of the People's Republic of China</i>
July 2018	National Development and Reform Commission	<i>Opinions on Innovating and Improving the Price Mechanism for Green Development</i>

Table 2 Relevant Policy Files Relating to Industrial Wastewater Treatment Industry.

Data source: GEP Research.

1.3 Analysis of Technical Policies and Environment

At present, in order to regulate and guide the industrial development, China has issued more than 10 standards relating to industrial wastewater treatment industry, more than 60 national environmental standards for water pollutant discharge, more than 30 local environmental standards for water pollutant discharge, and more than 20 technical specifications for wastewater treatment engineering.

Serial No.	Standard No.	Standard Name
1	GB18918-2002	<i>Pollutant Discharge Standards for Urban Sewage Treatment Plants</i>
2	GB50672-2011	<i>Process Design Specifications for Integrated Sewage Treatment Plants in Iron and Steel Enterprises</i>
3	GB50684-2011	<i>Design Specifications for the Treatment and Reuse of Chemical Industrial Wastewater</i>
4	GB50747-2012	<i>Design Specifications for Petrochemical Wastewater Treatment</i>
5	GB50963-2014	<i>Design Specifications for the Treatment of Sulphuric Acid and Phosphate Fertilizer Production Wastewater</i>
6	GB/T31962-2015	<i>Quality Standards for Wastewater Discharged into Urban Sewers</i>
7	GB50335-2016	<i>Design Specifications for Urban Wastewater Recycling Project</i>

8	GB50334-2017	<i>Acceptance Specifications for the Engineering Quality of Urban Wastewater Treatment Plants</i>
9	GB51221-2017	<i>Construction Specifications for Urban Wastewater Treatment Plant Projects</i>
10	GB/T51230-2017	<i>Design Specifications for Wastewater Treatment in Chlor-Alkali Production</i>
11	GB/T33815-2017	<i>Technical Specifications for Wastewater Treatment of Iron Ore Mining and Processing Enterprises</i>

*Table 3 Relevant Standards for Industrial Wastewater Treatment Industry.
Data source: GEP Research.*

1.3.1. Discharge Standards

The 13th Five-Year Development Plan for the National Environmental Protection Standards was put forward to satisfy the requirements of the 10-Chapter Water Pollution Prevention and Control Action Plan, and to give priority to formulate relevant discharge standards with focuses on industrial sources, living sources, agricultural sources, and other key areas of water pollution prevention and control. Among them, the industrial wastewater treatment mainly focuses on 10 key industries, with the purpose of improving the control indicators and requirements of industrial-source water pollutants. It also added and formulated water discharge standards for some emerging industries, such as coal chemical and shale gas mining industries, and revised the comprehensive wastewater discharge standards.

Based on this plan, the national and local governments have strengthened the development of relevant standards. In particular, the development and implementation of discharge standards in key industries and the pollutant discharge standard system for industrial wastewater have been improved.

1.3.1.1. National Discharge Standards

By the end of 2018, China issued more than 60 sound and improved pollutant discharge standards relating to industrial wastewater.

1.3.1.1. Local Discharge Standards

All the provinces and cities have significantly strengthened their efforts to formulate local discharge standards relating to water pollutant discharge according to their respective industrial structure and discharge reduction directions. By the end of 2018, more than 30 local discharge standards relating to water pollutant discharge were issued in various provinces and cities.

1.3.2. Technical Specifications

At present, China has issued more than 20 technical specifications for wastewater treatment projects, mainly involving the technical specifications for wastewater treatment in more than 20 sub-areas, including textile dyeing and finishing, brewing, electroplating, tanning and fur processing, slaughter and meat processing, pulping and papermaking, sugar production, steel industry and coking.

2. Demand Analysis and Prospect Forecast for the Industrial Wastewater Treatment Industry in China

2.1. Market Demand Analysis and Trend Forecast for Industrial Wastewater Treatment Industry

2.1.1. Market Capacity

According to GEP Research data, the market size of the industrial wastewater treatment industry was about RMB 106.1 billion in China in 2018. The market size of industrial wastewater engineering investment accounted for about RMB 7.5 billion, while the market size of industrial wastewater treatment operation accounted for about RMB 98.6 billion. The annual compound growth rate of the industrial wastewater treatment industry in China was 6% from 2012 to 2018. GEP Research also estimated that the industrial wastewater treatment industry in China would have a market size of about RMB 109.4 billion and RMB 112.5 billion respectively in 2020 and 2025. It would show a steady development.

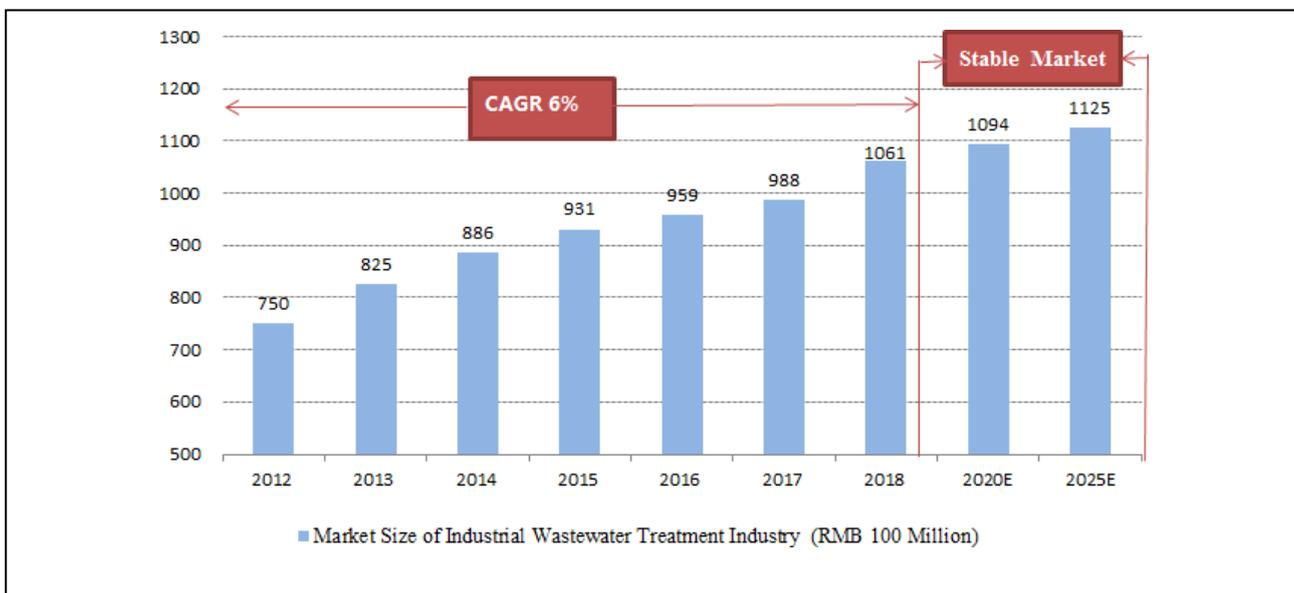


Figure 1 2012-2025 Demand Market Capacity and Forecast of China's Industrial Wastewater Treatment Industry.
Data source: GEP Research.

2.1.2. Demand Structure Analysis and Prospects

The industrial wastewater operation service market accounts for 80-95% of the market shares. In 2018, the market size of industrial wastewater treatment and operation services market accounted for about 93%, while the industrial wastewater engineering investment market accounted for about 7%. It is estimated that the market size of the industrial wastewater treatment and operation services market will account for about 95% in 2025, and that of the industrial wastewater engineering investment market will account for about 5%.

2.1.2.1. Investment in Industrial Wastewater Treatment Engineering

In 2018, the market size of the investment market related to industrial wastewater treatment engineering in China was approximately RMB 7.5 billion, with a year-on-year decrease of 1.8%. It is estimated that the

market size would reach about RMB 6 billion in 2025, with an annual compound growth rate of about -3.1% from 2018 to 2025.

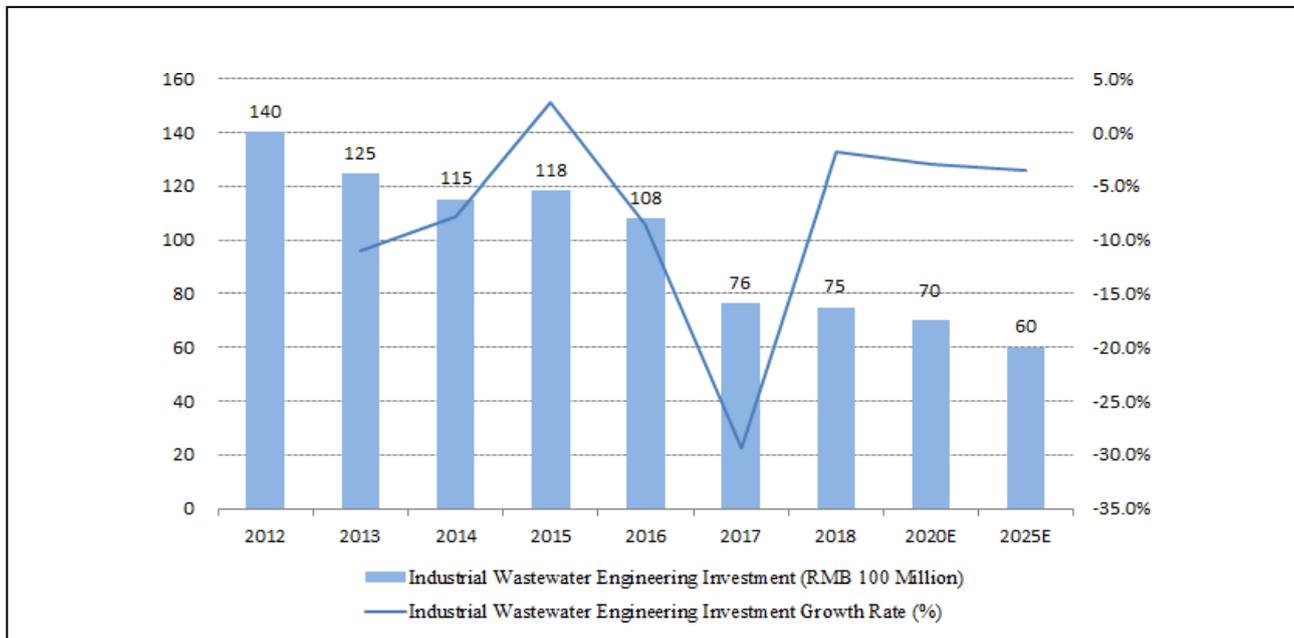


Figure 2 2012-2025 China's Industrial Wastewater Treatment Engineering Investment and Forecast.
Data source: GEP Research.

2.1.2.2. Industrial Wastewater Operation Service Market

According to GEP Research data, in 2018 the market size of the industrial wastewater operation service market was approximately RMB 98.6 billion in China, with an annual compound growth rate of about 8% from 2012 to 2018. Considering the slowdown in the growth rate of operating expenses and the further improvement in the reuse rate of industrial wastewater, it is expected that the annual compound growth rate of the industrial wastewater operation service market would decrease from 2018 to 2025. The market size will be approximately RMB 100.2 billion and 106.5 billion respectively in 2020 and 2025.

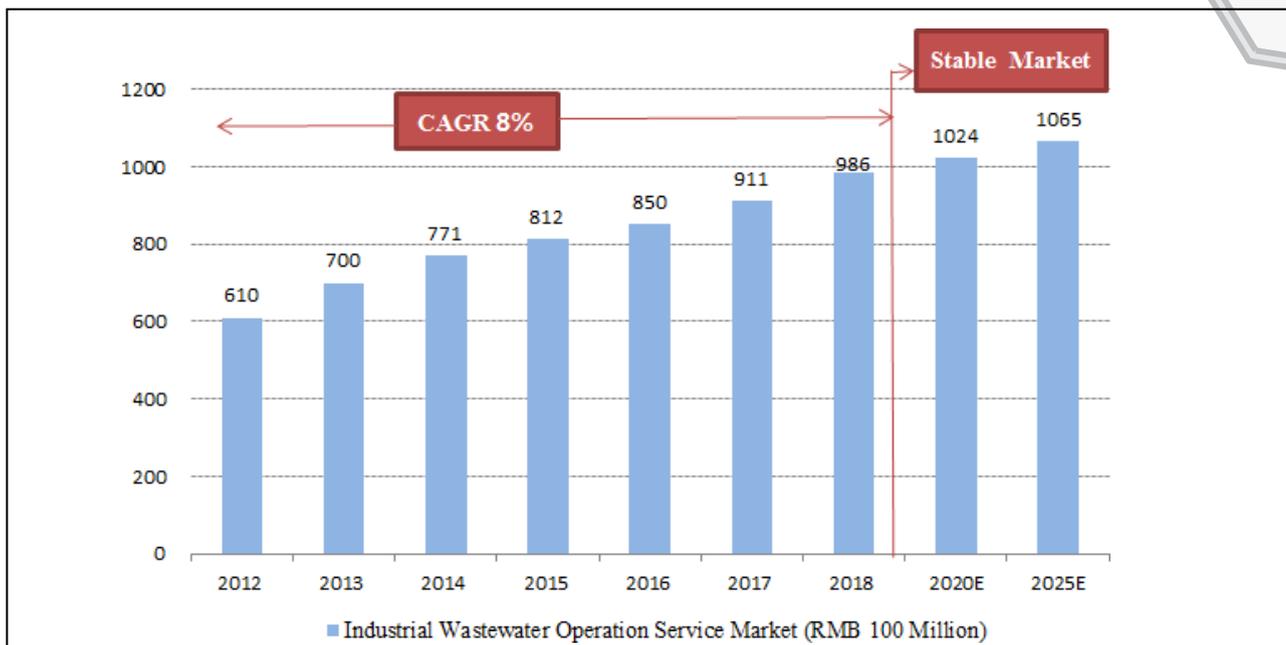


Figure 3 2012-2025 China's Industrial Wastewater Operation Service Market and Relevant Forecast.
Data source: GEP Research.

2.2. Demand Development Trends and Driving Factors

With the introduction of policies, such as the *10-Chapter Water Pollution Prevention and Control Action Plan and Third-Party Governance Models*, as well as the continuous improvements in discharge standards and strengthened supervision actions, the industrial wastewater treatment industry should have further development.

2.2.1. Severe Water Use in China

In recent years, China has faced water resources shortage with uneven distribution, as the total water resources and per capita water resources have generally declined.

In 2018, China's total water resource volume was about 3 trillion m³, accounting for 6% of the global water resources. However, compared to the population base in China, the per capita water resource volume is only one-quarter of the world's average per capita water resource volume. Although it exceeds the minimum per capita demand of 1,000 m³, the gap with some developed countries is still very significant. American per capita average volume, for example, is of 8,800 m³.

In recent years, China's industrial water consumption has taken a relatively large share all along. In 2018, China's industrial water consumption volume was about 128.5 billion m³ per year, accounting for about 21% of the total water consumption volume. The huge industrial water consumption has exacerbated China's water shortage dilemma.

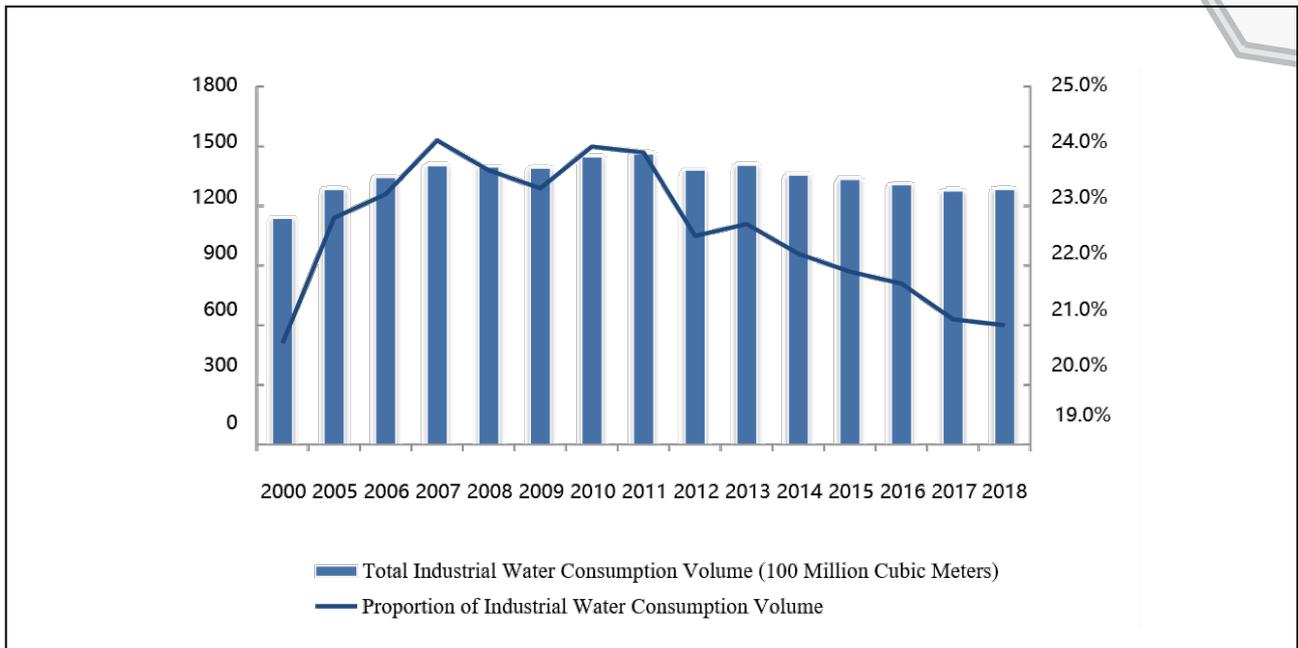


Figure 4 2000-2018 China's Total Industrial Water Consumption Volume and Proportion.
Data source: GEP Research.

2.2.2. Generally Declined Initial Discharge Volume of Industrial Wastewater

In 2018, China's industrial wastewater treatment industry had a total processing capacity of about 30.4 billion tons, with six major industries including petrochemicals, thermal power, textile printing and dyeing, papermaking, electronics and pharmaceuticals accounting for about 60% of the total industrial processing capacity.

The discharge volume from the six key industries for industrial wastewater treatment decreased from 12.8 billion tons in 2012 to about 9.6 billion tons in 2018, with a decrease rate of about 25%. This shows an overall declining trend of discharge volume and a gradual increase of wastewater reuse volume. By 2018, the wastewater reuse volume in the six key industries accounted for about 47% of the total treatment volume.

Through the improvement of water saving and sewage treatment, it is expected that the discharge volume of industrial wastewater would continue to decline in the future. It is also estimated that the discharge volume from the six key industries focusing on industrial wastewater treatment in China will be about 7.7 billion tons in 2025, with the wastewater reuse volume maintaining a steady increase.

The high wastewater reuse rate and rapid development of the six key industries mainly benefited from the good momentum for desulfurization and zero liquid discharge wastewater treatment market in the thermal power industry, stimulated by national policies, and from the simplicity and low cost (80%) of the recycled papermaking and wastewater reuse process in the paper industry.

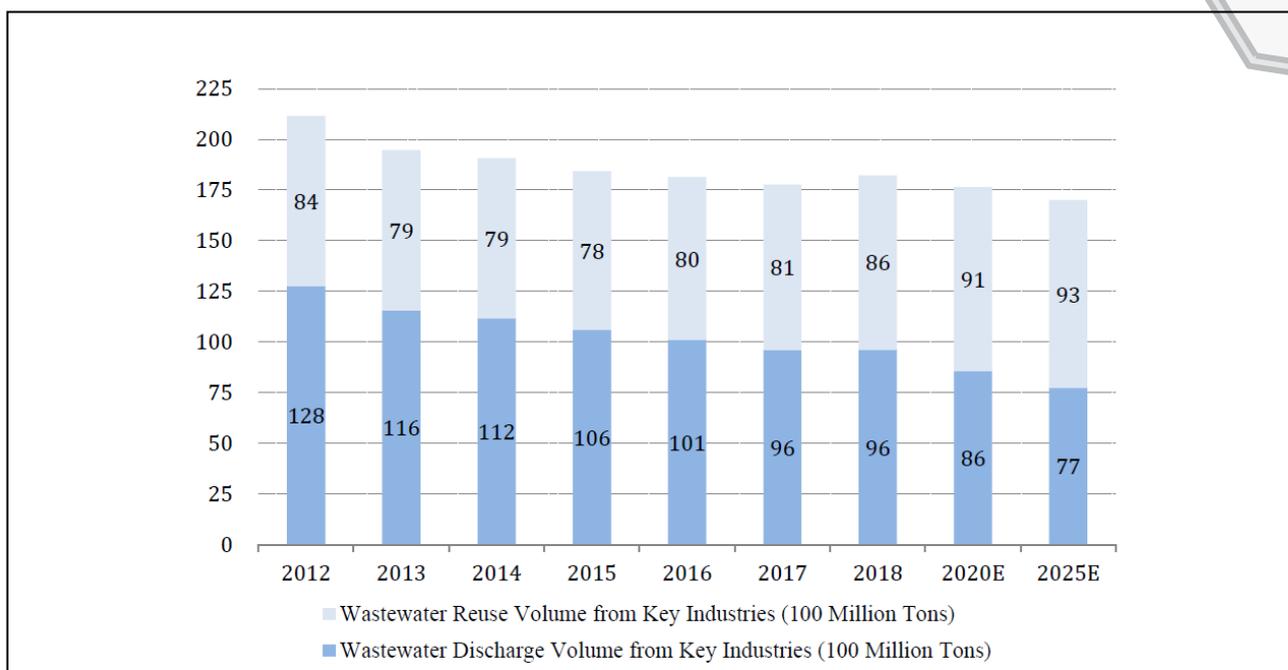


Figure 5 2012-2025 Treatment Volume and Forecast of Six Key Industries for Industrial Wastewater Treatment in China (treatment capacity = discharge volume + reuse volume, key industries: petrochemical, thermal power, textile printing and dyeing, papermaking, electronics and pharmaceuticals industries).
Data source: GEP Research.

From the perspective of the discharge sources of industrial wastewater, in 2018, the industries with the largest demands for industrial wastewater treatment were the petrochemical and papermaking industries, with an annual treatment volume of more than 5 billion tons, respectively accounting for 28% and 19% of the total treatment volume. They were followed by textile printing and dyeing and thermal power industries, with an annual treatment volume of more than 1.5 billion tons, respectively accounting for 7% and 5% of the total treatment volume.

2.2.3. National Environmental Protection Policies and Industrial Wastewater Treatment Demands

The *Environmental Protection Tax Law* came into effect on January 1, 2018. The year 2018 marked the first year of pollution discharge permit reform, which would cover the entire industry in 2020. The *Classification Management Catalogue of Pollution Discharge Permits for Fixed Pollution Sources* specified the time limit for the implementation of pollution discharge permits in various industries from 2017 to 2020. Prior to the end of June 2017, the issuance of pollution discharge permits in power and papermaking industries were required to be completed. By the end of 2017, the issuance of pollution discharge permits in 13 industries, including electroplating, nonferrous metals, steel, cement, flat glass, pharmaceuticals, pesticides, fertilizers, were required to be concluded. Before the end of 2018, pollution discharge permits in five industries, including non-ferrous metals, steel, chemical raw materials and chemicals, petrochemicals, and slaughtering, had to be issued. The *Environmental Protection Law* and pollution discharge permits for various industries have stimulated demands for industrial wastewater treatment.

2.3. Regional Market Demand Analysis and Prospects

2.3.1. Regional Distribution of Pollutants in Wastewater

At present, pollutants in wastewater mainly come from industrial wastewater, discharged from various factories, while the domestic sewage accounts for a relatively small proportion. Pollutants discharged from wastewater are mainly concentrated in Guangdong, Jiangsu, Shandong, Yunnan, Jiangxi, Hunan, Hubei and other regions. Among them, Yunnan and Jiangxi have relatively large discharge volumes of heavy metals, such as lead, mercury, cadmium, and arsenic. Currently, the main demand regions for industrial wastewater treatment are concentrated in Guangdong, Jiangsu, Shandong, Hunan, Yunnan, Jiangxi, Hubei, Inner Mongolia, and Gansu, among others.

2.3.2. Distribution of Industrial Wastewater Discharge Volume in Major Cities

The cities with an annual industrial wastewater discharge volume of more than 100 million tons are Shanghai, Hangzhou, Guangzhou, Chongqing, Tianjin, Nanjing, and Wuhan. Among them, the annual industrial wastewater discharge volumes of Shanghai, Hangzhou and Guangzhou exceed 200 million tons. These cities are the current key demand cities for industrial wastewater treatment.

2.3.3. Key Industries Demands

The industrial wastewater discharge industries are relatively concentrated, and the current demands in the treatment market are mainly concentrated in petrochemical, thermal power, papermaking, textile, electronics and pharmaceutical industries. In 2018, the market size of the industrial wastewater operation market was RMB 98.6 billion. The six key industries, including petrochemicals, thermal power, papermaking, textiles, electronics, and pharmaceuticals industries, accounted for about 60% of the total industrial wastewater treatment volume, with a treatment scale accounting for 75% of the overall scale of industrial wastewater treatment demands, amounting to about RMB 73.9 billion.

3. Analysis of the Supply and Competition in China's Industrial Wastewater Treatment Industry

The development trend of the industrial wastewater treatment market has attracted a large number of non-environmental protection enterprises. Meanwhile, various central and listed enterprises have set up environmental protection investment departments and acquired environmental protection enterprises in succession. Traditional water treatment industries and municipal water conservancy and garden enterprises have also actively sought opportunities to enter this field. Large enterprises have relied on their originally accumulated operating advantages and have taken full use of the power of the capital market to intervene in the industrial wastewater treatment market, which further intensified the industrial competition. According to GEP Research, the CR10 in China's industrial wastewater treatment industry in 2018 accounted for less than 10%, with low industry concentration ratio and scattered industry competition. The industry concentration ratio is expected to increase.

In terms of operation market, in 2018, the daily industrial wastewater treatment capacities of major benchmarking enterprises range from 10,000 tons to 200,000 tons, with a relatively small market share. According to GEP Research, in 2018 the CR10 enterprises in the industrial wastewater treatment operation market occupied a market share of about 1.5%, and the industrial wastewater businesses were mostly engineering projects.

4. Analysis of Profitability of Industrial Wastewater Treatment Industry

According to GEP Research, in 2018 the gross profit margin of the engineering sector in China's industrial wastewater treatment industry was 10-15%, and the gross profit margin of the operating services sector was about 20-30%. The gross profit margin of industrial wastewater benchmarking enterprises in the engineering sector was 10-20%, while the gross margin of operating services sector was 20-35%. Since the engineering investment scale was relatively small compared to the size of the operating market, the gross profit margin of comprehensive industrial wastewater treatment services of benchmarking enterprises also remains around 20-35%.

Service Type	Overall Industrial Gross Profit Margin	Gross Profit Margin of Benchmark Enterprise	Gross Profit Margin of SME
Industrial wastewater treatment project	10%-15%	10%-20%	5%-10%
Operation Services of Industrial Wastewater Treatment Facilities	20%-30%	20%-35%	20%-30%

*Table 4 Profitability Status of Industrial Wastewater Treatment Industry.
Data source: GEP Research.*



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