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Research on Economic Policies for Centralized Disposal of Medical Waste

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Foreword »

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Since its opening-up and reform, China has been in the process of rapid economic development with its people enjoying an increasingly improved standard of life. Meanwhile accompanying this dramatic economic growth is the degradation of environment which has, to some extent, damaged the gains of the opening-up and reform and prevented the economy from a healthy and sustainable development. The Chinese government is increasingly aware of that without addressing the environmental issues it is facing now will jeopardize its long term goal of the great rejuvenation of the Chinese nation. Given the magnitude and complexity of the environmental issues in China, there is no easy way in addressing them and the solution to them entails an equal priority being given to environmental protection, ecological conservation and economic development or even higher than the latter by mainstreaming the former into the overall socio-economic decision-making process. As a matter of fact, China has been in the struggle against environmental

pollution since the very beginning of its economic take-off and trying to explore a pathway that could help address China's environmental issues in the way most suitable to China's specific circumstances.

In recent years, especially since the 12th Five-Year Plan period, the enhanced measures including legislation, policy, regulatory and economic means have been taken by the Chinese government in dealing with environmental problems, of which environmental policies have played an important role in this regard. Corresponding to this situation and in meeting the demand of governments at different levels for environmental policy tools, the environmental policy research projects on topics of a wide range have been conducted by some Chinese environmental research institutions including the Chinese Academy for Environmental Planning (CAEP).

CAEP founded in 2001 is a research advisory body supporting governments in the

development of key environmental planning, national environmental policies, and major environmental engineering projects. In the past more than 10 years, CAEP has accomplished the development of the overall planning of national environmental protection for the 10th, 11th and 12th Five-Year Plan periods; water pollution prevention and control planning for key river basins; air pollution prevention and control planning for key regions; soil pollution prevention and control planning; and some regional environmental protection plans. In the same period of time, CAEP also actively engaged in research on such topics as green GDP, environmental taxation, emission trading, ecological compensation, green financing, etc. By so doing, CAEP has become an indispensable advisory body in the environmental decision-making in mainland China. According to *2013 Global Go To Think Tanks Report and Policy Advice* published by University of Pennsylvania, CAEP was ranked 31 in the field of environment in the world. Many of CAEP's research results and project outcomes regarding environmental policies have drawn great attention of decision makers and international institutions, and have been utilized to contribute to the formulation of national environmental policies concerned.

The Chinese Environmental Policy Research Working Paper (CEPRWP) is a new internal publication produced by CAEP for the purpose of facilitating the academic exchange with foreign colleagues in this field, in which the selected research papers on environmental policies from CAEP are set out on the irregular basis. It is expected that this publication will not only make

CAEP's research results on environmental policies be known by foreign colleagues but also serve as a catalyst for creating opportunity of international cooperation in the field of environmental policies, and environmental economics in particular, with a view of both the academic research and practical policy needs.

With the development of medical care in China, the amount of medical waste is also increasing, the disposal and management of medical waste is particularly important. However, China has limited legislation and management experience in the treatment of medical waste. Especially after the outbreak of "SARS" in 2003, such problems became more prominent. Since then, CAEP has begun to carry out relevant research in the field of medical waste management and technology. We started the preparation work for the formation of "National Hazardous Waste and Medical Waste Disposal Facilities Construction Planning", and promised to provide more than ten years of technical support. We also participated in the project of sustainable environmental management of medical waste in China, undertaking the sub-project of "Research on the Economic Treatment of Medical Waste Disposal" and "Study on the Construction and Operation Mode of Medical Waste Disposal Facilities", at the same time providing technical support for the demonstration activities. We also participated in the compiling of "Technical Specifications for Steam Autoclave Centralized Treatment Engineering on Medical Waste" and "The Best Feasible Technical Guidelines of Medical Waste Disposal", which cultivated a professional research team for our academy.

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1 INTRODUCTION

In order to prevent and control the pollution of persistent organic pollutants (“POPs”), the international community has enacted the Stockholm International Convention on Persistent Organic Pollutants (“the Stockholm Convention”), which was formally signed by China on May 23, 2001, and took effect on November 11, 2004. To ensure the efficient implementation of the Stockholm Convention in the country, a National Working Group for the Implementation of the Stockholm Convention, led by the former State Environmental Protection Administration and consisting of 11 relevant ministries including the Ministry of Foreign Affairs, the National Development and Reform Commission, the Ministry of Science and Technology and the Ministry of Finance, was approved by the State Council in May, 2005, and the former State Environmental Protection Administration established a Special Office for the Implementation of the Stockholm Convention (“the Implementation Office”). On April 14, 2007, the National Implementation Plan for the Implementation of the Stockholm Convention (“National Implementation Plan”) was approved by the State Council, which marked the full implementation of the Stockholm Convention in China. The National Implementation Plan aims to reduce, eliminate and prevent the health and environmental risks posed by POPs, to sustain human health, and to maintain the safety of the ecological environment. With the goal of promoting sustainable development, eight preferred areas for development are identified, including the introduction and development of alternative technology, best available technology/best environment practice (“BAT/BEP”) and contaminated site remediation technology, control of dioxin emissions in

key industries with BAT/BEP, development of project demonstration and comprehensive promotion. The national objectives stipulated in the National Implementation Plan are that by 2008, a management system of effectively implementing BAT/BEP in key industries which produce POPs unintentionally shall be basically established so as to achieve the application of BAT and the promotion of BEP in new sources of key industries, that by 2010, a more well-established management system of implementing BAT/BEP in existed sources of key industries which produce POPs unintentionally shall be established and the corresponding demonstration activities shall be accomplished, and that by 2015, BAT/BEP shall be widely applied in key industries and the increase trend of dioxin emissions shall be basically controlled.

Medical waste incineration is identified in the National Implementation Plan as one of the key industries which produce POPs unintentionally with priority control. In order to prevent and control the POPs pollution caused by the medical waste incineration industry, China’s Sustainable Environmental Management for Medical Waste Project” was designed by the Ministry of Environmental Protection with the assistance of international agencies, and was jointly implemented by the Environmental Protection Cooperation Center and the United Nations Industrial Development Organization. Combined with the implementation of the National Plan on the Construction of Hazardous Waste and Medical Waste Disposal Facility, this project aims to incorporate the management concept of the whole process of medical waste lifecycle into China’s medical waste management and disposal practices, to fully promote the application of BAT/BEP



required in the Stockholm Convention, and to improve the ability of managing and disposing medical waste in China, thus facilitating the environmentally sound management of medical waste. In view of several problems existed in China at that time such as ineffective guarantee of facility operation funds for medical waste disposal

and insufficient incentive policies related to medical waste disposal, the economic policies for medical waste disposal is included in the overall design of the project as one important respect. The main consideration of this project is to figure out how to support disposal facilities to achieve expected performance with economic policies.

2 STATUS QUO OF MEDICAL WASTE DISPOSAL INDUSTRY AND ITS ECONOMIC POLICIES

2.1 Status Quo of Medical Waste Disposal Industry

The development of medical waste disposal in China is undergoing a process “from decentralization to centralization” and this transformation reflects that China is witnessing a more standardized and industrialized medical waste disposal industry. The outbreak of SARS in 2003 acted as the “catalyst” for the rapid development of China’s medical waste disposal industry. Before the SARS outbreak, medical waste disposal was limited to dispersive disposal inside hospitals, and only a small number of cities adopted the model of centralized disposal of medical waste. At that time, the main features of medical waste disposal could be summarized as incompetent disposal and low centralized disposal rate; inadequate legal and regulatory system; low disposal level and serious secondary pollution; insufficient technical support; and a vague understanding of technology route for medical waste disposal. During the SARS outbreak, faced with the requirement of safe disposal of medical waste and the country’s disadvantaged medical waste disposal industry, the State Council attached great importance to the issue and

organized relevant departments to conduct researches and propose solutions. In 2003, Medical Waste Management Ordinance (GWYL[2003] No.380) was promulgated and implemented and in the same year, National Plan on the Construction of Hazardous Waste and Medical Waste Disposal Facility (“Plan”) was approved. The Ordinance established the direction of medical waste centralized disposal and industrialized development in legislation, and the Plan would put centralized disposal into practice; that is, 277 medical waste centralized disposal facilities were to be built in the country’s prefecture-level cities. At the same time, a series of regulations, standards and norms have been introduced to strengthen the functional management of medical waste and explore the industrialization for medical waste disposal.

After more than ten years of rapid development, China’s medical waste disposal industry has been basically on the track. By the end of 2015, more than 90% of the facilities mentioned in the Plan were put into operation. A total of 288 medical waste business licenses were issued in the country among which 24 were for the disposal facilities of both hazardous waste and



medical waste and 264 for disposal facilities of medical waste only, with disposal capacity of more than 2400t/d. The load rate of more than one third of the urban disposal facilities were 90% and one out of five of medical waste disposal facilities were in full load or overload capacity. Half of the facilities use incineration technology and the other half use non-incineration technology, with pyrolysis incineration and steam autoclave technology as the main technical solutions for medical waste disposal. Over ten engineering technical specifications for different disposal technologies were promulgated successively including centralized disposal and centralized incineration of medical waste, high temperature steam, chemical disinfection and microwave treatment. The technologies and the standard system for medical waste disposal were basically established.

2.2 Economic Policy Framework for Medical Waste Disposal

The current economic policies for medical waste disposal mainly include fund investment, land supply, disposal charge and preferential tax among which, fund investment policy and land supply policy are mainly used in the construction phase of disposal facilities while disposal charge policy and preferential tax policy mainly serve the operation stage of disposal facilities.

2.2.1 Fund Investment Policy

The government has allocated national debt funds to support the construction of centralized disposal facilities for hazardous waste and medical waste: 30% of the total construction cost will be subsidized in eastern China; 60% in central China and 75% in western China. With the support of the national debt funds, the large-scale and

organized construction of centralized disposal facilities for medical waste has been carried out smoothly. Not only the construction of medical waste disposal facilities was promoted, but also local funds were driven to flow into the construction field of medical waste disposal facilities, thus promoting the formation of medical waste disposal industry. By the end of October 2014, 197 centralized disposal projects for medical waste mentioned in the Plan were funded by a total of 1.36 billion yuan from the national debt fund, and attracted social capital of more than 2 billion yuan. About 70% of medical waste disposal facilities have used the national debt funds, and the construction of centralized disposal facilities in some prefectural cities such as Dongguan, Nantong and Wuhan are carried out with self-raised funds of enterprises. According to the different sources of funds, the investment modes of centralized disposal facilities for medical waste can be divided into three categories, namely, government investment, mixed investment and enterprise investment. In the government investment mode, the construction funds mainly come from the national debt funds and the local financial funds. After the completion of the facility, a designated public institution or enterprise will be responsible for its operation. This mode is commonly seen in the central and western regions of China, especially in the western cities. Most of the existing centralized disposal facilities for medical waste adopt the mixed investment model, with construction funds coming from financial and social funds. In the enterprise investment mode, the construction funds are all from social funds, and this mode is widely adopted in well-developed and highly market-oriented regions such as Jiangsu, Zhejiang, Guangdong and Fujian.



Attracting social funds and dealing with the construction, operation and maintenance of centralized disposal facilities for medical waste in a market-oriented manner is an imperative approach for the development of the industry. However, owing to the public property attribute of centralized disposal facilities for medical waste, a single market mechanism is far from enough. At present, both domestic and foreign environmental infrastructure is usually franchised to social capital and in China, concession is used as an operation mode in centralized disposal facilities as well as a financing mode. According to the Measures for the Administration of Concession for Infrastructure and Public Utilities jointly issued by the six ministries and commissions in 2015, the concession for infrastructure and public utilities refers to the operation mode in which legal persons or other organizations inside or outside the People's Republic of China were legally authorized by the Chinese government by means of competition to build and operate infrastructure and public utilities and earn profits, provide public products or services, with their rights, obligations and risk sharing clarified in agreements. Concession conveys the concept of equality and efficiency and it is conducive to attracting high-quality social resources to participate in the construction and operation of disposal facilities. However, in order to ensure the investment return of social funds, this model also has exclusive and monopolistic characteristics. Given that a prefecture-level city has only one centralized disposal facility for medical waste, once a certain enterprise obtain concession through competition and its disposal load does not meet the agreed proportion, other enterprises will be naturally prevented from entering the field in the concession period.

2.2.2 Land Supply Policy

In order to solve land selection and land acquisition difficulties during the implementation of the Plan, the former State Environmental Protection Administration proposed to the Ministry of Land and Resources that in accordance with the Article 6 of the Management Measures for Land Use Annual Plan (Ministry of Land and Resources Decree No. 26, November 1, 2004) promulgated by the Ministry of Land and Resources, the land use indicators that needed to be handled by the construction projects within the Plan would be collected and summarized and after the proposal of farmland transfer plan put forward before September 25 of the previous year was examined. After that, the indicators would be reported to the Ministry of Land and Resources for approval and land resources management department and the development and reform department where the land was located should be informed and include the indicators in addition to the year's land use indicators. The Ministry of Land and Resources replied to the Administration in a document (GTZT [2005] No.331) that: 1) Regarding the issue of land use indicators of construction projects, the Management Measures for Land Use Annual Plan (Order of the Land and Resources Department No. 26) stipulates that it would be examined and approved by the State Council and the relevant departments of the State Council and that the State Council would approve that the occupied indicators of land use plan of the construction project of independent location for farmland transfer would not make known to lower levels and indicators would be directly allocated when approving the land use of the construction project while the indicators of land use of other construction



projects would be arranged by the local plans. Therefore, the land use indicators of specific construction projects in the Plan such as the independent site selection projects approved by the State Council and the relevant departments of the State Council shall be arranged by the country while indicators of other projects shall be included in the local plan indicators. 2) When preparing the annual land use plan, the environmental protection department would put forward proposals and suggestions on construction projects which would use land in the year, including those in the Plan, to the Ministry of Land and Resources. The Ministry of Land and Resources would take the suggestions into full account when comprehensively balancing the plans.

2.2.3 Charging Policy

The National Development and Reform Commission and relevant ministries and commissions jointly released the Notice on Implementation of Charging System for Hazardous Waste Disposal and Promotion of Industrialization for Hazardous Waste Disposal (FGJG [2003] No.1874), which requires that the charging policy for hazardous waste disposal shall be prepared in accordance with the principle of “full compensation for cost (including collection and transportation cost) plus reasonable profits”, so as to ensure the normal operation of disposal facilities. The Notice also clarifies that hazardous waste and medical waste disposal charge belongs to business service charge, and the principles and methods of formulating charging standards. In the implementation of construction projects, each city has formulated its own management approaches and charging standards for medical waste according to the Notice, thus accelerate the pace of industrialized

development of hazardous waste and medical waste disposal.

The charging policy for medical waste disposal is at the center of the economic policy system. The reasons are as follows: 1) The construction period of medical waste disposal facilities varies from several months to several years, and the operation period can be as long as one or several decades. The economic policy adopted during the operation period has a great impact on the long-term operation of facilities while preferential tax policies are usually prepared based on the charging policies of waste disposal. 2) Investors recover cost and gain profit through the disposal charges. The preparation and implementation of the charging policy determines whether the invested funds can obtain reasonable returns and further affects investor’s enthusiasm in investing funds to medical waste disposal. 3) The preparation and implementation of the charging policy is closely linked to related stakeholders of medical waste disposal, which acts as the foothold of balancing interests of all parties as well as the point where contradictions are most easily intensified. Based on the above reasons, in-depth researches on the preparation and implementation of charging policy for medical waste disposal and proposals on practical and feasible improvement programs are necessary for improving the economic policies for medical waste disposal. Therefore, the preparation and implementation of the charging policy for medical waste disposal will be introduced in Chapter 3 of this report.

2.2.4 Preferential Tax Policies

Preferential tax policies refer to the various means such as taxation, tax increase, tax exemption and tax deduction through which



the country encourages people to engage in environmental protection activities and avoid behaviors that are harmful to the environment. There is no targeted preferential

tax policy for China's medical waste disposal industry, and preferential tax policies relating to the industry are listed below in Table 2-1.

 **Table 2-1 List of Preferential Tax Policies**

Tax Type	Name of Document	Content	Preparation Body
Business Tax	Approval of the State Administration of Taxation on Levying Business Tax on Waste Disposal Charges (GSH [2005] No.1128) (Invalid)	Waste disposal charges are free from business tax.	State Administration of Taxation
Value-Added Tax	Notice on Comprehensive Launch of Pilot Programs to Replace Business Tax with Value-Added Tax (CS[2016] No. 36)	Since May 1, 2016, pilot programs of replacing business tax with value-added tax have been comprehensively launched in the country.	State Administration of Taxation
Income Tax 2015 2015	Enterprise Income Tax Law of the People's Republic of China (2007)	Income from qualified environmental protection, energy conservation and water conservation projects can enjoy tax preference. Investments in the acquisition of special facilities for environmental protection, energy conservation, water conservation, safety production and other special facilities can offset the taxable amount based on a certain percentage. As for an enterprise's fixed assets, the total number of years of depreciation can be reduced or an accelerated depreciation method can be adopted. High-tech enterprise can enjoy a preferential income tax rate at 15% (the normal tax rate is 25%).	National People's Congress
	Ordinance on the Implementation of Enterprise Income Tax Law of the People's Republic of China (Order of the State Council No.512, 2007)	Income from public waste disposal of the enterprise can enjoy "Three-Year Exemption and Three-Year Half Reduction". 10% of money invested on the special equipment can be offset from the enterprise's tax amount payable in the same year	State Administration of Taxation
	Notice on Income Tax of Enterprise Fixed Assets with Accelerated Depreciation (GSF[2009] No.81)	As for fixed assets with rapid upgrading of products due to technology advancement and those with strong vibration and high corrosion all the year round, the total number of years of depreciation can be reduced or an accelerated depreciation method can be adopted.	
Environmental Protection Tax	Environmental Protection Tax Law of the People's Republic of China (2016)	Where an enterprise, public institution or any other producer or operator stores or disposes of solid wastes at any facility or site that meets the national and local environmental protection standards, it shall not be deemed as directly discharging pollutants to the environment, and shall not pay environmental protection tax.	National People's Congress



(1) Business Tax/Value-Added Tax

It is stipulated in the Approval of the State Administration of Taxation on Levying Business Tax on Waste Disposal Charges (GSH[2005] No.1128) promulgated by the State Administration of Taxation that waste disposal services provided by enterprises and individuals do not belong to the taxable services of business tax, and waste disposal charge collected from disposal of waste is exempt from business tax. According to this provision, before 2016, domestic waste disposal industry generally enjoyed provisions of business tax exemption, but due to the unclear policy of the medical waste disposal industry, the actual operations in different places were different. As a result, quite many cities did not enjoy the preferential policy with exemption from business tax. According to the Notice on Comprehensive Launch of Pilot Programs to Replace Business Tax with Value-Added Tax (CS[2016] No. 36), since May 1, 2016, pilot programs of replacing business tax with value-added tax have been comprehensively launched.

(2) Income Tax

Up to date, there is no clear policies on corporate income tax in the medical waste disposal industry. According to the provisions of Article 27 of the Enterprise Income Tax Law, for enterprises engaged in public sewage treatment and public waste treatment, tax is exempted in the first three years and reduced to half in the following 3 years since the year when the enterprise obtained its first operating income. The specific terms and conditions will be promulgated by the finance and taxation departments under the State Council and shall be implemented after the State Council's approval. In this Article, public waste disposal enterprises are not clearly

defined and the specific terms and conditions are not published, so the charging measures vary from place to place. As for other taxes such as property tax, land use tax, vehicle and vessel use tax and road maintenance fee, the charging items, calculation methods and local policies vary from different enterprises.

In addition, according to Notice on Income Tax of Enterprise Fixed Assets with Accelerated Depreciation (GSF[2009] No.81), for fixed assets with rapid upgrading of products due to technology advancement and those with strong vibration and high corrosion all the year round, the total number of years of depreciation can be reduced or an accelerated depreciation method can be adopted.. This income tax preferential policy was not widely implemented in the medical waste disposal industry. Medical waste disposal facilities usually use straight-line depreciation method with a decade-time limit. Based on the service life that mechanical equipment can reach after several overhauls and equally-shared value of equipment, this method calculates equipment depreciation cost in accordance with the stipulated depreciation rate. If enterprises apply for accelerated depreciation on their own, it is usually difficult to be approved.

(3) Environmental Protection Tax

The Environmental Protection Tax Law will take effect on January 1, 2018. It is stipulated in Article 4 that where an enterprise, public institution or any other producer or operator stores or disposes of solid wastes at any facility or site that meet the national and local environmental protection standards, it shall not be deemed as directly discharging pollutants to the environment, and shall not pay environmental protection tax on the corresponding pollutants. The environmental



protection tax is an indirect tax preference for medical waste disposal enterprises that comply with the relevant standards, but currently the detailed implementation rules are not yet clear.

2.3 Major Problems of Economic Policies

At present, three prominent problems exist in the economic policies for medical waste disposal in China:

(1) Excessive reliance on market functions and inadequate performance of government functions

Medical waste centralized disposal facilities are built and operated in a market-oriented way, which greatly eases the government's financial pressure, so that many local governments have benefited from that in the short term. However, some local governments lack a deep understanding of the essence of the market mechanism and have little expectation on market risks, they did not perform their duties in the implementation of the project. Most local governments have failed to give necessary economic policy support for medical waste disposal in remote areas, leading to simple disposal or loss of medical waste.

(2) Insufficient support for the operation process which makes operation extremely difficult

The long-standing problem of focusing on construction while ignoring operation in the infrastructure field virtually affects medical waste disposal facilities. Some medical waste disposal facilities are related to public welfare, therefore, in the operation process, especially in the early stage of operation, it is necessary for the government to give priority

support by introducing economic policies in finance, tax, credit and other aspects. At present, only a very small number of cities offer financial subsidies on the operation of medical waste disposal facilities, and tax preferential policy related to medical waste disposal industry cannot be fully implemented due to the lack of operation rules. Some disposal facilities in China's western region were built with national debt funds and have been left unused due to unguaranteed operation cost and absence of operators.

(3) Insufficient support for the preparation of charging policy and implementation are faced with many difficulties

First, the majority of provincial charging policies are absent and the charging policy transits directly from the national level to the municipal level, thus there lacks coordinated arrangement and unified guidance for disposal charge of medical waste at provincial level. In addition, the preparation of charging policy is not scientific and operational. In most charging standards, the management cost of medical institutions is not taken into consideration. There are no operation rules on how to include disposal charge into medical service cost. Moreover, it is quite difficult to implement the charging policy. Medical institutions are reluctant to sign disposal agreement with disposal enterprises, and part of the disposal charges are paid from the profit of medical institutions, resulting in default or less payment. However, there lack practical administrative approaches for disposal enterprises to protect their rights.



3 PREPARATION OF CHARGING POLICY FOR MEDICAL WASTE DISPOSAL AND EVALUATION OF ITS IMPLEMENTATION

3.1 Preparation of Charging Policy

It is stipulated in Article 55 of the Law of the People's Republic of China on the Prevention and Control of Environment Pollution Caused by Solid Wastes that in case that an entity fails to dispose of the waste within the specified period of time, or the disposal does not comply with the relevant State regulations, the competent environmental protection departments of the local people's government above prefecture level shall assign other entities to dispose of the waste in accordance with relevant State regulations, and the entities discharging hazardous waste shall bear the disposal cost. This article embodies the principle of paid service for hazardous waste disposal, which provides legal guarantee for the establishment of the charging system.

Before 2003, that is, before the implementation of the Plan, although China did not explicitly put forward the industrialized operation of medical waste disposal, paid service for medical waste disposal was carried out in several cities including Guangdong, Hangzhou, Fuzhou, Wuhan and Nanchang, and the charging standard and management method for medical waste disposal were prepared, laying a solid foundation for the establishment of the charging system for medical waste disposal in China.

Since 2003, a series of documents relevant to the charging policy for medical waste

disposal (Table 3-1) has been released at national level, and focuses vary from phase to phase. The changes are closely related to the development process of the medical waste disposal industry in China. In the preliminary stage, the charging policy focused on establishing a charging system for medical waste disposal. Guidance was offered on the decision-making body, preparation principle and procedure, and operational mechanism of the charging standard in some documents including the Medical Waste Management Ordinance and the Notice on Implementation of Charging System for Hazardous Waste Disposal and Promotion of Industrialization for Hazardous Waste Disposal (FGJG[2003]No.1874) ("the Notice"). With the implementation of the Plan and rapid development of construction of medical waste centralized disposal facilities, charging standards for medical waste disposal were prepared all over the country. Around 2010, a large number of facilities for centralized disposal of medical waste shifted from the construction stage to the operation stage, and conflicts and problems existed in the charging policy occurred. In light of these conflicts and problems, relevant plans and documents released in the "12th Five-Year" Plan period further elaborated on the requirements in several aspects including disposal cost sharing modes, thus greatly improved the charging policy.



Table 3-1 Documents Relevant to the Charging Policy for Medical Waste Disposal

Release Year	Name of Document	Content
2003	Medical Waste Management Ordinance	Article 31 Medical waste centralized disposal enterprises charge medical and health institutions for medical waste disposal fees. Medical waste disposal fees paid by medical and health institutions in accordance with the provisions can be included in medical care cost.
2003	Notice on Implementation of Charging System for Hazardous Waste Disposal and Promotion of Industrialization for Hazardous Waste Disposal (FGJG[2003] No.1874)	In accordance with the principle of compensation for hazardous waste disposal cost and reasonable profitability, the charging system for hazardous waste disposal shall be fully implemented so as to promote the virtuous circle in this industry. Charging management approaches shall be prepared at provincial level while the specific charging standards shall be made by the pricing department of prefecture-level cities.
2012	Pollution Prevention Plan for Hazardous Waste during the "12th Five-Year" Plan Period	Supervise and urge medical institutions to incorporate medical waste disposal fees into medical service cost.
2014	Notice on Further Strengthening Medical Waste Management	By the end of 2015, a sound charging system for medical waste disposal shall be established. The cost-sharing issue of medical waste disposal fees shall be solved by introducing medical insurance coverage and financial investment.

At present, charging policies for medical waste disposal have been established in over 200 prefecture-level cities with medical waste disposal facilities. Provincial charging management approaches for medical waste disposal have been introduced in more than 10 provinces including Guangdong, Fujian, Jiangsu, Hubei, Gansu and Jilin. Investigations reveal the charging policies (i.e., charging models, charging standards and bearing methods) in different places and details are mentioned hereinafter.

3.2 Implementation of Charging Policy

3.2.1 Charging Model

Generally, two charging models are adopted in the investigated places: in the first model, fees are mainly charged based on the number of beds, supplemented by weight classified into multi-levels while in the second model, fees are charged according to weight.

(1) Model 1: fees are mainly charged based on the number of beds, supplemented by weight classified into multi-levels

In this model, medical institutions with fixed

beds charge in accordance with the number of beds, while medical institutions without fixed bed distinguish their weights or their types of medical institutions, adopting multi-level quota charging. There are a few cities in which fees are charged according to weight. For medical institutions with fixed beds, the disposal fees are calculated as follows.

$$\text{Disposal fee (yuan/month)} = \text{number of beds} * \text{bed usage rate} * \text{charging standard (yuan/bed} \cdot \text{day)} * \text{number of days}$$

In some areas such as Zunyi and Yanbian, as for whether medical institutions shall charge based on the number of beds, there is a minimum standard for the numbers. In Zunyi,



it is stipulated that medical institutions with over 5 beds shall charge based on the number of beds, while in Yanbian, the minimum number of beds for adopting such a charging standard is 30. Medical institutions with less than 30 fixed beds shall charge in accordance with the standard of medical institutions without beds.

As for medical institutions without fixed beds, there are three main charging methods:

1) In cities such as Nanyang, Weihai, Huangshan, Zunyi, and Yangzhou, fees are charged according to different types of medical institutions classified into multi-levels and quota;

2) In most cities in Hunan Province, as well as Nanchang, Xiamen, and Liu'an, fees are charged according to weight classified into multi-levels and quota;

3) In cities such as Yanbian and Tianjin, fees are charged according to weight. In cities like Rizhao, Nanyang and Qiqihar, both 1) and 3) are optional. Medical institutions and disposal enterprises shall determine which method to adopt. Viewing the charging methods of medical waste disposal at home and abroad, medical waste disposal fees are usually charged based on the number of beds, while medical institutions without beds adopt various charging methods, among which the weight-based method with multi-levels is more widely applied. In addition, fees are also charged according to unit weight, operation areas and different levels of medical institutions. There hasn't been a mainstream charging method available in outpatient departments. As for whether to charge waste disposal in outpatient departments based on unit weight, number of outpatients, or to make it free, practices vary

from city to city.

As for the bed-number charging model, the verification of the number of beds is the most critical. In some cities fees are calculated based on the data provided by medical institutions, while in other cities the actual bed numbers and bed usage rate approved by the health department are referred to. In the actual operation, disposal enterprises are often placed in a disadvantaged position as medical institutions often conceal the real number of beds and the data from the health department cannot reveal the real conditions of bed increase in medical institutions. According to statistics, the disposal enterprises can benefit from providing services to large hospitals which pay the fees based on bed numbers. However, the disposal enterprises can barely make up the disposal cost if small-sized medical institutions also pay in this way. In some places, the waste collection rate of different medical institutions is directly stipulated in the charging document so as to protect the interests of disposal enterprises.

(2) Model 2: fees are charged according to weight

In this model, fees are charged according to the weight of medical wastes generated by medical institutions, regardless of the institution's type or whether it has any beds.

Disposal fee (yuan/month) = monthly weight of medical wastes generated by medical institutions (kg/month) * charging standard (yuan/kg).

In this model, on the one hand, every single batch of medical waste needs to be weighed, this, to some extent, leads to increase in operation difficulties. On the other hand, loss of medical waste is likely to happen



as medical institutions want to reduce disposal costs. This model is more suitable for cities with higher level of environmental supervision. This model is then improved as medical institutions are classified into multi-levels according to the average amount of wastes they generate per month and fixed fees are paid according to the classifications. The improved model is more practical as payment is fixed.

Model 1 is adopted in most cities in China while Model 2 is adopted in a few regions. Beijing, Guangzhou, Tianjin and other cities with large amount of medical waste production prefer the charging method based on weight. Guangzhou adopted the bed-number charging method before 2014 and changed to the weight-based charging

method afterwards. In Shanghai, both models are used: for medical institutions with beds, medical waste disposal fees are calculated according to the actual occupation of the number of beds, and for mental hospitals, nursing homes and community health service centers where there are beds but small amount of waste production, the weight-based model is adopted. In Suzhou, it is stipulated that medical institutions at or above level II can choose from either model while other medical and health institutions shall adopt the weight-based model. In Xuzhou, medical institutions with more than 20 beds shall adopt the weight-based model. If the medical institution cannot weigh the wastes, payment based on the number of beds is also acceptable.

Table 3-2 Advantages and Disadvantages of Different Charging Methods

Charging methods	Bed number-based	Weight-based	Weight-based with multi-levels	Quota-based
Advantages	With good operability, widely accepted.	Fees are charged according to actual amount generated, fair and reasonable.	Weighing procedure is simplified and waste collection rate increased.	Simple and easy, with stable charge income.
Disadvantages	The actual number of beds used is not easy to identify.	With poor operability, likely to lead to waste loss.	The actual waste amount is likely to be larger than approved waste amount, thus leading to increase of disposal cost for enterprises.	It is quite difficult to make different standards for different medical institutions. Cost is hard to control.
Remarks	The most commonly used	The least commonly used	Commonly used	Commonly used

Note: Weight-based method with multi-levels is in fact an improved version of the weight-based method and hereby listed separately for comparison.

3.2.3 Charging Standard

Local charging standards vary greatly from city to city while there is not much difference within provinces.

The price range of medical waste disposal charged based on bed numbers is 1.5-3.3 yuan/bed•day, mostly in the range of 2.0-2.5 yuan/bed•day. For instance, it is 2.3 yuan/bed•day in Shanghai, 2.3-2.5 yuan/bed•day in



Jiangxi, 2.0-2.5 yuan/bed•day in Hubei, 1.8-2.6 yuan/bed•day in Jilin. Charging standard in Henan is generally lower than 2.2 yuan/bed•day, while in Wenzhou and Ningbo, it is up to 3.2 yuan/bed•day and 3.3 yuan/bed•day. Some cities have further distinguished different types of medical institutions and adopt different charging standards. For example, in Nanyang, the charging standard for medical institutions with fixed beds in urban areas and counties is 1.9 yuan/bed•day, and 1.8 yuan/bed•day in townships. In Huangshan, medical institutions are classified into county-level and above and township-level. The charging standard for the former is 2 yuan/bed•day while for the latter is 0.5 yuan/bed•day.

The price range of medical waste disposal charged based on weight is 2.0-5.0 yuan/kg. For instance, it is 2.0 yuan/kg in Hubei, 2.81 yuan/kg in Shanghai, 2.8 yuan/kg in Hangzhou, 3.0 yuan/kg in Tianjin, 3.5 yuan/kg in Xuzhou. In Jilin Province, some medical institutions without beds adopt the weight-based charging method, and the charging standard is quite high, mainly around 4.0 yuan/kg, and up to 5.0 yuan/kg in Yanbian.

Quota-based charging method according to different levels of medical institutions: in Weihai, two levels of charging of 180 yuan and 70 yuan are implemented. In Huangshan, medical institutions without beds above county level charge at 50-100 yuan/month. In Zunyi, Yangzhou, Nanyang and other cities, medical institutions with different scales and at different levels are particularly divided and the corresponding quota charging standard is provided. Quota-based charging method according to weight: in Changsha, medical institutions that generate over 30 kg of waste

per month shall pay 1,000 yuan, 20-30 kg 800 yuan, 10-20 kg 600 yuan, 5-10 kg 400 yuan, 2-5 kg 200 yuan and 0-2 kg 100 yuan.

As for whether to collect waste disposal fees in outpatient departments and how much shall be charged, stipulations vary from city to city. In Nanchang and Liu'an, fees are collected according to the number of outpatients (yuan/person). In Rizhao, Weihai and Huangshan, fees are collected monthly according to fixed quota. In Changsha, Zunyi, Xiaogan and Jingzhou, medical institutions are exempt from payment. In Nanyang, Nanchang and Xiamen, 0.1 yuan/person is charged, in Tianjin it is 0.5 yuan/person and in Yangzhou it is 0.05 yuan/person for emergency department.

Floating management is implemented in terms of the charging standards for medical waste disposal in some cities, that is, a benchmark price and a floating range of the charging standard are formulated by the Government. The charging policy in Hangzhou clearly shows that the charging standard is able to drop 10% to the maximum, and the specific floating range shall be jointly determined by the disposal enterprises and medical institutions. The charging policy in Ningbo takes into account the impact of transportation distance on disposal cost, allowing disposal enterprises to raise the fees up to 10% in cities with long transportation distance such as Cixi, Yuyao, Xiangshan, Fenghua and Ninghai. In Suzhou, the maximum charging standard a 10% downward range is stipulated in the bed number-based charging policy and the weight-based charging standard has a 10% fluctuation range.

3.2.4 Collecting Method



According to Article 31 of Medical Waste Management Ordinance, medical waste centralized disposal enterprises can charge medical and health institutions for disposal fees as per relevant national provisions. It is stipulated in the Industrialization Notice that hazardous waste disposal enterprises shall follow the provision of the price control department in the charging standard, sign a centralized disposal service agreement with medical institutions, and identify the responsibilities, rights and interests of the two sides.

According to the provisions above, basically the same mode is adopted in collecting disposal fees, i.e., service contracts are signed between disposal enterprises and medical institutions; the number of beds, bed usage rate, the amount of medical wastes and other basic information and data are negotiated and determined by both parties and the disposal fees are directly paid by medical institutions to the bank accounts of disposal enterprises

It should be noted that the collecting method of medical waste disposal fees is quite different from that of urban sewage treatment fees which also belongs to urban environmental infrastructure. Urban sewage treatment fees and water charges are paid together by enterprises and individuals to a designated bank which turns in the money to the financial department. Then the financial department allocates the money to the construction department, and lastly, the construction department returns the money to the sewage treatment plant. Enterprises and individuals generating urban sewage don't directly pay the sewage treatment plants and nor does the sewage treatment plants directly charge enterprise and individuals. The sewage treatment plants shall apply for operation

funds from construction authorities and subsidies from local financial departments.

3.2.5 Bearing Method

The smooth implementation of charging policies largely depends on who bears the medical waste disposal fees. It is stipulated in the Medical Waste Management Ordinance that medical waste disposal fees can be included in medical service cost, **but how to include or charge is not specified in detail.** It is stipulated in the Notice that medical waste disposal fees can be included in medical service cost, which can be resolved by adjusting medical service prices, **but there are no detailed provisions regarding the name of services to be adjusted or how the adjustments shall be made.**

In local charging documents, it is only stipulated that medical waste disposal fees shall be included in medical service cost, but there is no specific instructions for medical institutions. The investigation finds that different interpretations to the requirement of “being included in medical service cost and adjusting medical service price”, and the different phases of medical service price reform leads to different provisions on who bears medical waste disposal fees. There are three methods in practice:

(1) Fees are included in the operation cost of medical institutions, but borne by patients. Medical waste disposal fees are actually borne by patients, and **medical waste disposal fees are added to the charging list of patients** in some cities such as Weihai in Shandong, Liu'an in Anhui and Tianjin. Approved by relevant authorities, medical waste disposal fees are collected by adjusting medical service price: for in-patients, medical waste disposal fees are added to the ward fees



and in the transfusion clinics, disposal fees are added to the treatment fee. This method is well-accepted by medical institutions and medical waste disposal fees can be collected quite easily.

(2) Fees are included in the operation cost of medical institutions but completely borne by medical institutions. In places like Fujian Province, Beijing, Rizhao in Shandong, Changsha in Hunan and Yiyang, adjustments to medical service price lag behind. Disposal fees are included in the operation cost of medical institutions, and are fully borne by those medical institutions. In Fujian Province, it is stipulated that medical waste disposal fees shall be included in medical service cost, but cannot be collected directly from patients under the name of “hazardous waste (medical waste) disposal fee”. In the above cities, it is required that medical waste disposal fees cannot be collected directly from patients. The medical service price approved by the Price Control Department shall remain unchanged, while disposal fees shall be covered by medical institutions with their operation profits. Therefore, medical institutions are likely to resist this “extra” cost, which can easily lead to false reporting of the number of beds or arrears of charge.

(3) Fees are borne by both patients and medical institutions. In some places, it is believed that medical waste disposal fees should be borne by medical institutions and patients rather than either party individually. This is a compromise method, and the specific practices vary from place to place. In Zhuzhou, Hunan, the medical waste disposal fees are mainly paid by hospitals, subsidized by public finance, and adequately undertaken by patients. In Zunyi, Guizhou, 1.85 yuan

is charged for each bed and 1 yuan is paid by the hospital while the rest 0.85 yuan is paid by the patient. In Nanyang of Henan, Huangshan of Anhui, Xiaogan and Jingzhou of Hubei, it is required that **disposal fees of medical waste generated from beds** in medical institutions shall be borne by patients, while medical institutions without beds and clinics shall cover the expenses by themselves. In addition, it is stipulated in Nanyang that patients enjoying international assistance and free treatment approved by national policies are exempt from the disposal fees. This is to ensure the division of responsibility and ease public controversies. However, it is still difficult for medical institutions to raise their awareness of paying for medical waste disposal.

As for whether disposal fees for waste disposal in outpatient departments shall be borne by patients, practices vary from city to city. In some places, the fees are already included in outpatient registration charges, while in other places, charges of this kind are explicitly prohibited. Investigations suggest that most outpatient cases don't generate any medical wastes, and that only a few outpatient cases such as topical application of drug and drug changing for trauma and infusion produce a small amount of wastes. Therefore, in accordance with the principle of “Polluter Pays”, most outpatient patients do not need to bear the disposal fees. Therefore, Nanyang's policy that medical institutions bear the disposal fees is quite reasonable and the practices have been witnessed fruitful achievements in a certain range.

Some cities in China are now carrying out final solutions to the medical waste disposal fees borne by patients. For example, in Huangshan of Anhui and Zunyi of Guizhou,



the disposal fees borne by patients can be included in the basic medical insurance for employees, basic medical insurance for urban residents, and rural cooperative medical insurance to be reimbursed on a pro-rata basis. This approach can effectively alleviate the patients' resistance to paying for disposal fees, which is conducive to the implementation of charging policy.

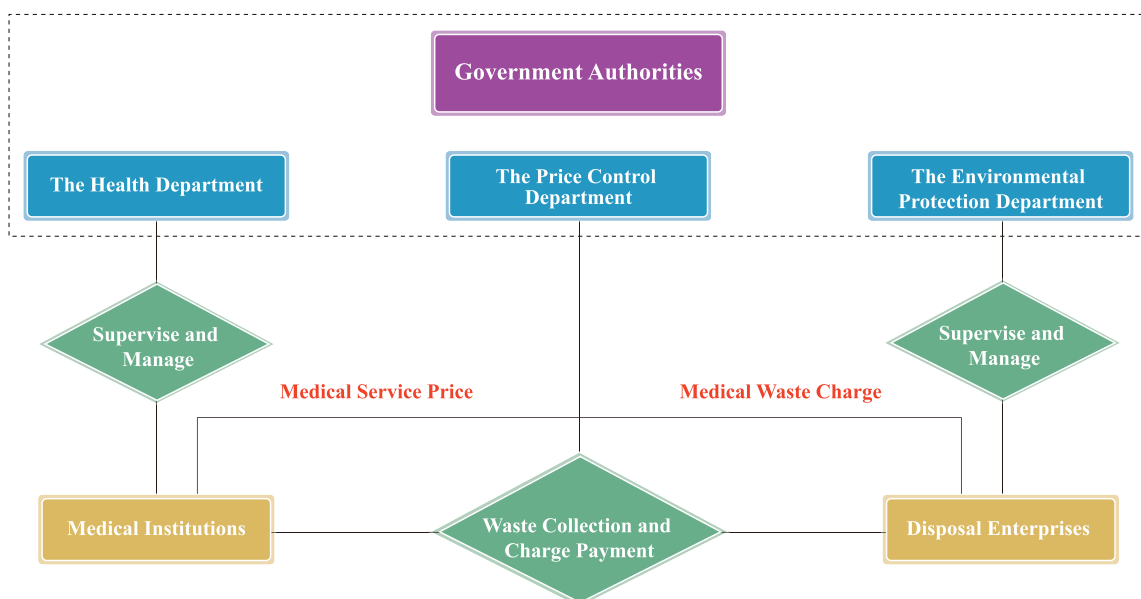
There are few cities that currently provide financial subsidies for medical waste disposal. In Changde, Hunan, before medical waste disposal fees are included in the operation cost of medical institutions, the municipal government used to subsidize half of the disposal fees (disposal fee for each bed is 2 yuan and the government subsidizes 1 yuan). In Huaihua, Hunan, medical waste disposal fees in remote areas are funded by governments at prefecture and municipal level. In Zhuzhou, Hunan, the municipal subsidizes the cost according to the actual situation of medical waste disposal. In Jiyuan, Henan, 600,000 yuan is subsidized

annually by the municipal finance department for medical waste disposal.

3.3 Major Problems

Figure 3-1 reflects the relations between government departments and disposal enterprises and medical institutions and between disposal enterprises and medical institutions. It can be seen from the Figure that the Health Department supervises and manages medical institutions, that the Environmental Protection Department supervises and manages disposal enterprises, and that the Price Control Department reviews and approves the charging standard for medical service in medical institutions and the charging standard for waste disposal in disposal enterprises. The relation between disposal enterprises and medical institutions is the interactive relation of waste collection and charge payment. Problems such as charging difficulty during the implementation process of the current charging policy are reflected in the various links shown in the Figure below.

■ Figure 3-1 How the Charging Policy Works





3.3.1 Lack of Detailed Basis for Preparing Charging Standard

As there lacks adequate research and scientific accounting when preparing the charging standard, the current standard has not yet been recognized by the supply and demand sides. During the implementation of the charging standard, there exist many discrepancies between disposal enterprises and medical institutions. Disposal enterprises claim that the charging standard being implemented is quite low, making it difficult to achieve “guaranteed low profit”, while medical institutions, especially large medical institutions, think that disposal fees are quite high which makes them unwilling to pay according to the standard, and thus arrears often occur.

There is omission in the cost accounting, and the cost accounting method is not clearly defined. The expressions about “cost” are not coherent, leading to different understandings of the concept and scope of the term. There are different expressions about “cost” in documents of different places, such as “operation and maintenance cost”, “disposal cost”, “operation cost” and so on. However, from the perspective of technological economics, the meaning and scope of these expressions are different, resulting in different interpretations and practices of the concept and scope of “cost”.

Environmental monitoring expenses are omitted in cost statistics while those expenses are very important for evaluating the disposal effectiveness of medical waste disposal enterprises and for implementing environmental supervision and regulation. According to relevant national provisions, medical waste disposal enterprises should carry out monitoring of dioxin emissions at least once a year. Air pollutants and pollutants

discharged into the water shall be monitored in each quarter, and at the same time, the online monitoring system for atmospheric emission must be in normal operation, as the data obtained from online monitoring is an important basis for process adjustment. The monitoring and maintenance charges are quite an amount of expenditure for incineration disposal enterprises, but these expenses are not yet included in the cost accounting. Therefore, enterprises are reluctant in conducting monitoring work and maintenance of online monitoring equipment, which exerts adverse impact on the normal operation of enterprises.

In addition, the goods consumption and management costs of medical waste collected separately within medical institutions are usually overlooked. Only a few regions such as Guangzhou and Ningbo allow medical institutions to retain 5-10% of disposal charges to cover the collection cost within medical institutions.

The preparation of local charging standards of medical waste disposal is usually based on the declared cost of the only enterprise within the jurisdiction, or the charging standards of the neighboring areas are used as reference. Under such circumstances in which enterprises are barely stimulated to reduce cost, cost can be falsely high^[5].

3.3.2 No Difference Shown in the Classification for different objects

Disposal costs of different types of medical institutions vary from different amounts of medical waste and transportation distances. At present, the charging standard in most cities adopts the bed-number based charging method, supplemented by classified quota divided into those with fixed beds and those



without fixed beds. Only a few cities make further classifications. This charging method cannot reflect the differences in medical waste disposal costs. For example, as for mental hospitals with beds and general hospitals, the generation intensity of medical waste in mental hospitals is generally much lower than that of general hospitals. Thus, using the same charging standard is clearly unfair. A small number of cities take into account the impact various factors have on medical waste disposal costs, so they provide certain negotiation space for disposal enterprises and medical institutions, generally 10%~20% of approved charging standard but still distant from the actual cost difference.

3.3.3 No Specific Method for the Adjustment of Charging Standard

Factors like inflation lead to rising labor and fuel cost year by year, and correspondingly, medical waste disposal cost also increases. However, the adjustment period of charging standard identified by the government is generally 6 to 10 years, which means that the adjustment of charging standard lags way behind the changes in disposal cost. In Wuhan, for example, the current charging standard was formulated in early 2006 (WJFZ [2006] No. 23), and it has been implemented for more than 10 years, while within only two years from 2011 to 2013, unit disposal cost of medical waste in Wuhan has increased by about 8%^[6]. At present, no specific stipulation has been made on the adjustment of the charging standard in relevant management methods for medical waste disposal fees all over the country. The charging policies have been implemented for more than ten years, but only a few cities once revised it and increased the fees to different degrees based on the previous charging standard.

3.3.4 Unreasonable Bearing Method for Disposal Fees

It is stipulated in the Medical Waste Management Ordinance and the Notice that medical waste disposal fees borne by medical institutions can be included in medical service cost, and medical institutions can adjust medical service price accordingly. However, no specific regulations have been made on the name of the services to be adjusted, how services will be adjusted or the specific practices of “being included in service cost”. Neither other documents nor local medical waste charging standards mentioned the details, resulting in the poor operation of this stipulation.

At present, only a very small number of cities have identified the specific ways that patients bear disposal fees in accordance with the principle of “Polluter Pays”. In most cities, disposal fees are still borne by medical institutions, easily leading to false reporting of the number of beds and arrears. In addition, the bed-number charging model is quite common, and most cities do not charge medical waste disposal in outpatient departments. However, investigations suggest that the amount of medical wastes generated from outpatient departments is rather considerable. In 2013, the disposal cost of medical wastes in outpatient department in Huangshi Medical Waste Disposal Center alone was up to over 1 million yuan. In the National Health Service Price Specification (2012 Edition) released in September 2012, more than 9,000 medical service projects were involved, among which at least 4,000 medical service projects would generate medical waste^[7]. It is not rational to simply attribute medical waste disposal charge to bed cost, which may mislead future classification and adjustment of bearing



method of disposal fees.

3.3.5 Lack of Targeted Charging Policy in Remote Areas

China's urban medical waste is basically included in the scope of centralized disposal, while safe disposal rate of medical waste in remote areas is still low with massive environmental and safety risks. Medical waste disposal in remote areas features long transportation distance, scattered distribution, low generation amount and high disposal cost. Without extra subsidies granted by the government, the only disposal enterprise in the neighborhood usually skip the disposal in those areas given limitations in transportation capability and cost. At present, one-package charging policy is adopted in most cities, while only a very small number of cities such as Nanchang and Huaihua have introduced a more detailed charging policy for remote areas. The inadaptation of policies has caused management vacancies of medical waste disposal in most remote areas.

3.3.6 Lack of Relevant Document Restraints in the Process of Charge Collection

Because of the unequal status between disposal enterprises and medical institutions, it is difficult for disposal enterprises to "ask for disposal payment". Waste disposal charge has been characterized as operation service charge in China, so collection and payment between medical waste disposal enterprises and medical institutions is entirely a kind of market behavior. The charging policy can be implemented when the buyer and the seller act in accordance with the signed agreement. But in reality, current laws and regulations have mandatory provisions that medical institutions must hand over medical wastes to

disposal enterprises for centralized disposal, and it is stipulated that medical institutions can adjust medical service prices to cover the fees. However, some medical institutions still have a negative attitude toward payment and some are even in arrears with disposal fees. Whether the medical institutions have paid for the fees is not subject to any restraints. Medical waste disposal enterprises are not law enforcement authorities, and they are often in a passive position when it comes to charge collection. Charge collection actually becomes "asking for charge" for disposal enterprises.

There are vacancies in supervising the implementation of the charging policy. The Health Department, the Environmental Protection Department and the Price Control Department have played an important role in health supervision, pollution prevention and control, and preparation of charging standards. Due to the different functional positioning of each department, more attention is paid to whether medical institutions hand over waste to disposal enterprises for disposal, whether disposal enterprises are effective in the implementation of environmentally sound waste disposal, and whether there are arbitrary charges. However, investigations suggest that problems such as incomprehensive monitoring over the implementation of charging policy by relevant authorities and inexecution or insufficient execution of the charging policy by medical institutions are easy to be ignored. Under the market-oriented operation, if there are no effective monitoring measures taken to ensure medical institutions pay the charges in full in a timely manner, it will be more difficult to promote the industrialization of medical waste disposal.



4 ANALYSIS OF INTEREST RELATIONS IN MEDICAL WASTE DISPOSAL

The analysis matrix of the power/interest of various stakeholders involved in medical waste disposal is shown in Table 4-1. A brief contrast to the powers and interests of nine direct stakeholders in medical waste disposal is carried out, and the stakeholders are classified into 4 sections in the power/interest

matrix (Figure 4-1). Government departments mainly include the environmental protection department, the health department, the financial (tax) department, the price control department, the social security and the transportation department.

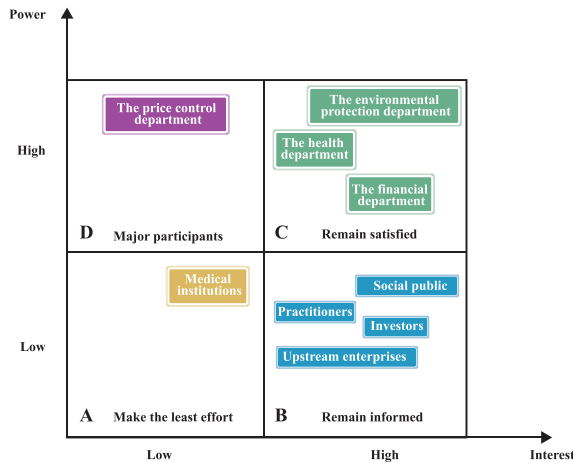
Table 4-1 Analysis Matrix of the Power/Interest of Stakeholders Involved in Medical Waste Disposal

Stakeholder	Power		Interest	
	High /Low	Specific Performance	High / Low	Specific Performance
The environmental protection department	Very High	Formulate policies, standards and plans for environmental protection, and monitor disposal facilities.	High	Realize the objective of environmental protection and increase the implementation effectiveness of the plan
The health department	Very High	Monitor medical institutions urge medical institutions to regulate waste management and improve medical waste collection rate, and promote stable and sustainable facility operation.	Quite High	The disposal of medical waste can be ensured and illegal discharges of waste by medical institutions are prevented.
The price control department	High	Approve the charging standard for medical waste disposal and decide the profitability of disposal enterprises.	Low	Regularize charging behavior of medical waste disposal and promote the stable development of the disposal market.
Investor	Low	Apply for preferential policies and take flexible measures to build partnerships with hospitals.	Very High	Gain investment returns.
Medical institution	Low	Apply for financial subsidies from the government department.	Low	Avoid legal and regulation punishment due to improper waste disposal.
Social public	Low	Participate in the promotion of medical waste disposal and clarify individual responsibilities and obligations.	High	Enjoy improved environment made possible medical waste disposal.
Upstream enterprise	Low	Develop economical and mature processing facilities and take the initiative in the development of the medical waste disposal industry.	Quite High	Gain corresponding returns from the development of the medical waste disposal industry.
Practitioner	Low	Take active measures and enhance work skills.	Quite High	Realize stable career development along with the stable development of the industry.

Note: Levels of power/profit in social security, transportation and financial departments are basically the same so details are not listed in the table.



■ Figure 4-1 Classification of Relevant Stakeholders in Centralized Disposal of Medical Waste



(1) According to the stakeholder theory, stakeholders in Section C shall be the focus of attention when preparing and implementing supporting economic policies for centralized disposal of medical waste as both their power and interest levels are high. The preparation and implementation of management systems such as Management Measures for Medical Waste Disposal needs to be promoted with joint efforts of the environmental protection and health departments, and the implementation of preferential tax policies and subsidies needs to be approved by the financial/tax departments. Therefore, it is necessary to ensure the stakeholders in Section C are the key participants in preparing and implementing supporting economic policies.

(2) Stakeholders in the Section D are the most difficult to deal with. The price control department only wants to ensure that the charging standard is reasonable and that there are no arbitrary charges. The price control department does not care about whether medical waste disposal enterprises have a reasonable profitability level, but the charging

standard approved by the price control department often determines the profitability of disposal enterprises. Therefore, the stakeholders in Section D cannot be neglected. It will be best if the stakeholders in Section C can encourage those in Section D to take the initiative to serve the policy preparation and implementation process, as they are also the main participants in preparing and implementing supporting economic policies.

(3) The interests of stakeholders in Section B are closely related to the development of medical waste disposal industry, but they don't have much power and have less influence on the preparation and implementation of supporting policies. When preparing and implementing supporting economic policies, they shall be kept informed of the latest updates such as the importance of environmentally sound medical waste disposal, the responsibility and obligation shouldered by them for medical waste disposal, and the legal basis for charging, etc. During the preparation of charging standards, opinions of disposal enterprises are necessary and their requirement on price adjustment should be promptly verified and confirmed in order to ensure that their position in the power/profit matrix remains unchanged, that is, they do not affect the policy preparation and implementation process.

(4) Stakeholders in Section A are a major obstacle toward the realization of strategic objectives, that is, the main obstacle to the implementation of supporting economic policies. Medical institutions certainly are not willing to bear corresponding medical waste disposal charges and they don't have much decision-making power in the preparation of the charging standard, so they make "the least



effort” in the supporting economic policies for medical waste disposal.

During the implementation of policies, the responsibilities of each party are as follows:

(1) National Level

The departments involved at national level include the Ministry of Environmental Protection, the National Development and Reform Commission, the Ministry of Finance and the State Administration of Taxation. Among them, the Ministry of Environmental Protection is responsible for taking the lead to organize proposals for economic policies of medical waste disposal, coordinating with the National Development and Reform Commission to solve relevant issues in investment and financing policies and charging system for medical waste disposal, coordinating with the Ministry of Finance and the State Administration of Taxation to solve the specific issues related to tax preference, verifying and responding to the preferential measures proposed by the local finance and tax department, and formulating appropriate guidance on tax preference according to the actual needs.

(2) Provincial Level

The departments involved at provincial level include the provincial environmental protection department, the health department, the financial department, the tax department, the social security department and transportation management department. It is recommended that the provincial environmental protection department should make joint efforts with other provincial departments to jointly issue management measures for medical waste and clarify the responsibilities and obligations of medical

institutions and disposal enterprises, coordinate with the financial department to study the financial subsidies in the initial operation of medical waste disposal enterprises and the specific sharing model for medical waste disposal charges, coordinate with the social security department to study relevant issues such as the inclusion of medical waste disposal charge borne by patients into the health insurance, and coordinate with the transportation department to take measures to reduce or exempt the road/bridge tolls paid by medical waste transfer vehicles.

(3) Municipal Level

The departments involved at municipal level are basically the counterparts of municipal departments. In some areas, the provincial departments perform monitoring and management functions while in other areas, the functions are performed by municipal departments. Municipal departments usually focus on implementation, and at the same time, make flexible stipulations in accordance with the real conditions of the city. The Municipal People’s Government is responsible for coordinating with various departments including the health, environmental protection, price control, finance, social security and construction departments to formulate relevant charging management approaches together, form joint supervision forces and improve the charging security. It is suggested that the health department should incorporate waste disposal into the examination and approval of medical license for medical institutions and that waste disposal contract is a must in the annual inspection. It is believed that this approach will urge medical institutions to pay for the charges and facilitate disposal enterprises



to approve the number of beds and the utilization rate of beds. The environmental protection department should strengthen the monitoring and management of medical institutions to prevent waste loss.

After the establishment of the “patients + medical institutions + finance” charge sharing model or other models, the municipal financial department should actively raise funds to subsidize medical waste disposal charges including medical waste transfer cost, fees charged in remote areas and fees occurred in serious epidemics. The specific amount should be determined according to the economic conditions of the region. It is recommended that the tax department offer the same level of preferential policies to medical waste disposal as those offered to domestic waste and sewage treatment.

It is suggested that the municipal development and reform department and the price department should monitor the cost, and widely ask for opinions and implement hearing for the approval of charging standards for medical institutions at all levels. Charging standard should be formulated based on the actual situation in the region, and there should be differences in different sizes and grades of medical institutions. The payment rate should be increased as much as possible. A dynamic adjustment mechanism for the charging standard should be implemented where the charging standard needs to be adjusted timely according to the price changes of the raw materials.

It is recommended that the municipal health department require medical institutions to explicitly include medical waste disposal charges into the charging system of medical institutions and adopt a separate charging code for disposal charge of medical waste

so as to make the statistics more clarified. Separate accounting will be made available in medical institutions and the price control department should also regularly check the income and expenditure of medical institutions in case of misappropriation or less-paid medical waste disposal charges.

(4) Project Level

The practitioner of the project, as the undertaker of medical waste disposal, shall fulfill the responsibilities and obligations stipulated in the laws and regulations. In order to ensure the environmentally sound disposal of medical waste, disposal procedures shall not be simplified and secret or reduced discharges shall be prohibited. Disposal enterprises shall take the initiative to improve the operation conditions to ensure the continued operation of disposal facilities. Payment incentive practices in Nanchang of Jiangxi, Xiaogan and Jingzhou of Hubei are encouraged to improve waste collection rate. For example, 10% of disposal charge in Nanchang of Jiangxi and no more than 5% of newly added disposal charge in Xiaogan of Hubei and Jingzhou are returned to medical institutions for classification and collection of medical waste, which to a certain extent, plays a positive role in encouraging payment.





5 SUGGESTIONS ON ECONOMIC POLICIES FOR MEDICAL WASTE DISPOSAL

5.1 Clarify Government Responsibility and Promote Innovation of Investment and Financing Mechanism

(1) Clarify Function Division of Environmental Protection between the Government and the Market

Low profits in medical waste disposal are considered a social contract between disposal enterprises and the government. Therefore during the transition period, it is essential for the government, as a defender of public interests, to financially subsidize the gap that the charging income of disposal enterprises is indeed insufficient to compensate for, including the cost of collection, transportation, transfer and terminal processing of medical waste, so as to cultivate the market. In the financial arrangement of the central and local government, operation fees should be gradually incorporated into the financial support priority so as to ensure the sustainable operation of disposal facilities. The use of funds should be shifted from the government investment to the government purchase. A fund usage mechanism that can well match the service demand of government purchase environment should be established to ease the government's pressure of one-time investment and promote the investment of social capital, thus achieving the amplification effect of government funds. In the use and distribution of government funds, performance orientation should be reflected; performance goals should be set and the follow-up assessment of performance

objectives should be strengthened. Performance assessment should be included in fund allocation and use so as to promote fund supervision and management.

(2) Encourage Diversified Investment and Financing and Innovation in Financial Service

The investment and financing mechanism should be innovated so as to attract social capital to enter the field of medical waste disposal and to give full play to the respective superiority of the government and the market funds. Pilot project of issuing bonds of urban environmental facility construction should be carried out in order to help local areas enrich the fund sources under a reasonable size. Service methods and means of financial institutions should be improved; innovation in the product and service of environmental protection enterprises should be implemented, and financial products suitable for environmental protection projects should be developed. In addition, we should encourage environmental protection enterprises to raise funds by equity financing and project financing, support enterprises in the introduction of funds from international financial institutions in accordance with relevant provisions, and support eligible enterprises' overseas listing and financing. Moreover, we should encourage the government, financial institutions and investment companies to set up investment funds for the environmental protection industry and provide financial support for pollution control projects and the development of environmental protection



enterprises. Furthermore, we should improve the credit rating system of environmental protection enterprises and issue credit loans to eligible enterprises. Lastly, new financing guarantee models such as charging right pledge and franchise pledge should be piloted and promoted.

5.2 Make Economic Policy More Reasonable and Strengthen Policy Implementation

(1) Establish Adjustment Mechanism for Price Accounting

It is recommended that some guidance documents including the accounting methods for charging standards and classification methods of medical waste disposal should be introduced at national level, that management methods of disposal charge should be formulated and improved at provincial level, and that monitoring and accounting of charging standard should be implemented at prefecture-city level, with specific reference of the implementation of the charging policy, thus forming a top-down and in-depth charging policy system. The price control department shall unify charge (price) composition and cost composition to ensure the accuracy of price accounting. According to the actual expenses in the operation of enterprises, the elements of cost should be further classified and the calculation method of fixed asset depreciation should be clarified. At the same time, cost monitoring of medical waste centralized disposal enterprises should be strengthened. Dynamic accounting and regular adjustment mechanism of charging standard should be established with clear price influencing factors. Taking economic development conditions into consideration, a detailed cost accounting should be conducted

every 3 to 5 years and charging standard should be redefined. Cities without charging standard revision for more than 5 years should carry out cost accounting as soon as possible. Under the circumstance that government guidance price is currently implemented, floating management mechanism can be introduced when revising the standard, or on the existing basis, appropriate floating range can be enlarged, giving greater freedom of consultation to both supply and demand sides.

(2) Prepare Classified Charging Standard

Based on the differences in level, size and operation of different medical institutions, charging standard will be further classified. Charging standard will be further classified for medical institutions with fixed beds based on their types. For medical institutions with fixed beds but less waste production such as mental hospitals, nursing homes and institutes of traditional Chinese medicine as well as township-level medical institutions whose medical waste production and medical income level are significantly different from urban hospitals, charging standard for fixed beds should be properly reduced. For specialized hospitals with a large amount of outpatients and a significantly small number of beds, corresponding charging standard should be formulated. Medical institutions without fixed beds should carry out different charging standards according to certain classification criteria. Medical institutions without fixed beds mainly include institutes of traditional Chinese medicine, outpatient departments, individual clinics, community health service stations, health-center clinics, dental clinics, tuberculosis control institutes, the Centers for Disease Control, maternal and child health center, blood bank and teaching



and research institute, all of which need to develop corresponding charging standards. Specifically, quota and diversified standards can be set according to the weight of medical waste generated, or the types and business areas of medical institutions, or calculated according to weight with fixed price per unit weight. Preferential policies should be encouraged in special medical institutions. For example, in Wenzhou, Zhejiang it is stipulated in the charging policy for medical waste disposal (2009) that charge deduction for special beds should be carried out. In psychiatric hospitals, charges of the approved number of beds are collected as 50% and the exceeding part as 30%. Beds in children hospitals and children beds in general hospitals are collected as 60%, and as for private hospitals whose beds actually used are less than 40% of the approved beds, it is collected as 40% of the approved beds.

(3) Promote the Inclusion of Disposal Fees into Medical Service Cost

Reasonable determination of charge bearer and the proportion of each party are actually to seek a balance of interests among medical institutions, disposal enterprises and patients, and meanwhile the local government may in a certain period bears part of the fees with subsidies to maintain balanced interests of the three parties. To include medical waste disposal fees into medical service cost is the best way to address charging source of medical waste disposal. Medical waste disposal fees can be added to ward fees in the in-patient department or medical treatment fees in the transfusion department so as to be covered in medical insurance. In the cities where medical waste disposal fees are borne by medical institutions, medical service price should be adjusted as soon as possible to

solve the source problem of disposal charge. Furthermore, medical institutions should have a comprehensive identification of medical service projects, and make scientific cost classification of medical waste disposal fees. At the same time, the cost of medical waste management and disposal should be fully taken into account, and should be included into medical service charges and be reflected in the allocation of disposal charges in the later period.

(4) Strengthen Policy Implementation

The preparation and implementation of charging policy for medical waste disposal involves the environmental protection department, the health department and the development and reform department, which requires coordination and cooperation between multiple departments. It is recommended that the people's governments at provincial and municipal level should organize relevant departments including the environmental protection department, the health department and the development and reform department to establish a joint management mechanism so as to convene meetings on problems encountered in the management of medical waste in a timely manner, actively discuss and formulate solutions and regularly carry out joint law enforcement inspection for medical institutions and disposal enterprises. Therefore, the generation, transportation and disposal of medical wastes and implementation of charging policies can be monitored; seamless cooperation between management departments such as the health department and the environmental protection department can be achieved and environmental risks can be reduced from the aspect of medical waste management.



Relevant management practices in the region should be improved timely, and the joint responsibility that medical institutions are supposed to shoulder when their arrears of disposal charge cause unsafe disposal of medical waste should be clarified. The health department can adopt appropriate ways to intervene in the implementation of the charging policy. For example, full payment certificate of medical waste disposal can be regarded as a necessary element in the process of renewal of certificates and the annual inspection of medical institutions, so that medical institutions can be urged to pay for the full disposal charge timely in accordance with the standard.

5.3 Strengthen Preparation and Implementation of Economic Policies during Operation

(1) Develop Economic Policies for Medical Waste Disposal in Remote Areas

In view of the relatively slow progress in the centralized disposal of medical waste in remote areas, it is suggested that the government should introduce effective economic policies to promote the overall improvement of medical waste disposal. Provincial and municipal charging policies should distinguish the different situations of medical waste disposal between urban and remote areas, and charging standard and bearing methods of medical waste disposal in remote areas should be determined based on accounting the disposal cost of medical waste in remote areas. Local environmental protection department should coordinate with relevant departments to implement preferential policies for the industry of medical waste disposal and actively strive for deduction in taxes and tolls according to

local conditions. Local finance departments can subsidize medical waste disposal in remote areas by investing in building transport facilities such as cold storage, or use awards instead of subsidies to improve the enthusiasm of enterprises for medical waste disposal in remote areas. In addition, the government can appropriately liberalize the exclusive franchise of medical waste disposal, thus attracting competitive and responsible enterprises to enter the disposal market in remote areas.

(2) Establish Environmental Margin System

Environmental margin system shall be jointly established by national and provincial governments to compensate medical waste disposal in case of accidents and emergencies to ensure safe disposal of medical waste under the circumstances. In the event of severe outbreaks of diseases, or disposal of some abandoned medical waste or wastes that the government determines to dispose of which requires significantly higher disposal cost, medical waste margins can be used to subsidize disposal enterprises.

(3) Accelerate Implementation of Relevant Preferential Policies

It should be clarified that medical waste centralized disposal facilities belong to urban infrastructures and lay a solid foundation for the preparation of various policies of encouragement, concession, investment and financial subsidies. It is suggested that the relevant departments including the Ministry of Finance and the State Administration of Taxation should accelerate the preparation and implementation of relevant preferential policies and provide preferential policies for main taxes in accordance with the



requirements of the Plan issued by the State Council. The local government should consider approving tax exemption or reduction in some disposal enterprises which has difficulties in paying property tax or urban land use tax and explore possibilities to reduce vehicle and vessel use tax. After performing the approval procedures, it is allowable to carry out tax deduction or tax exemption for property tax and land use tax, and the feasibility of deduction or exemption needs to be considered for vehicle and vessel use tax. It is recommended that the provincial transportation department should consider the deduction or exemption of road

tolls in order to reduce the transportation cost of disposal enterprises and promote further expansion of medical waste collection network. Moreover, it is suggested that based on corporate credit ratings, preferential policies should be given to compliance and law-abiding disposal enterprises. Preferential tax policies should also be given to transfer of waste disposal and treatment technologies, introduction and implementation of advanced process, technology, equipment, materials and technological consultation, transfer and service in accordance with relevant provisions.



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