

Integrated Solid Waste Management Wuxi New District, PRC

Assessment of Waste Management System



Presentation Outline

- ❖ National and Local Policies
- ❖ Institutions
- ❖ Operational Stages & Technology
- ❖ Financing
- ❖ Stakeholders' Role



National Policies - 1

	Law / Act
General	<ul style="list-style-type: none"> ▪ Environmental Protection Law of the People's Republic of China. Article 24 ▪ Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste ▪ City Planning Law of the People's Republic of China. - 1990.4.1 -
Source Reduction	
Garbage Classification	<ul style="list-style-type: none"> ▪ Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste. Article 42, Chapter 3
Collection and Storage	<ul style="list-style-type: none"> ▪ Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste. Article 40, 41, Chapter 3
Transportation and Administration	<ul style="list-style-type: none"> ▪ Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste. Article 23, Chapter 3 ▪ Regulations on the Control over Safety of Dangerous Chemicals. Article 4 ▪ Environmental Protection Law of the People's Republic of China. Article 33



National Policies - 2

Treatment and Disposal	
Landfill	<ul style="list-style-type: none"> ▪ Management Licenses for Hazardous Waste. Article 5, Chapter 2 ▪ Basel Convention. A, accessory 4
Incineration	
Circulation	
Recycle and Reuse	<ul style="list-style-type: none"> ▪ Basel Convention. B, accessory 4
Hazardous wastes (Industrial)	
Hazardous wastes (Medical)	<ul style="list-style-type: none"> ▪ Management Licenses for Hazardous Waste. Article 7, Chapter 3
Hazardous wastes (Others)	<ul style="list-style-type: none"> ▪ Safety and protection acts for radioactive isotope radial facility. Article 7, 23, Chapter 2; Article 32, 39, Chapter 3 ▪ Management Licenses for Hazardous Waste. Article 24, Chapter 2; Article 55, Chapter 6
Constrution, Demolition and Eviction	<ul style="list-style-type: none"> ▪ Construction law of the People's Republic of China. Article 41, Chapter 5



Local Policies - 1

	Technical Standard
General	<ul style="list-style-type: none"> ▪ Sanitary standard for the design of industrial enterprise. Article 2, 25 ▪ Urban environmental sanitation quality standard. No. 21, [1997] ▪ Code for planning of urban environmental sanitation facilities. GB50337/2003 ▪ Integrated wastewater discharge standard. GB8978/1996 ▪ Emission Standard for Odor Pollutants. GB14554/93 ▪ Environmental quality standard for soils. GB15618/1995 ▪ Quality standard for ground water. GB/T14848/1993 ▪ Environmental quality standard for surface water. GB3838/2002
Collection and Storage	<ul style="list-style-type: none"> ▪ Sanitary standard for the design of industrial enterprise. Article 5 ▪ Standard for location of urban environment sanitation facilities. CJJ27/89
Treatment and Disposal	<ul style="list-style-type: none"> ▪ Standard on poly chlorinated biphenyls for wastes. Article 4 ▪ Standard for the designing of industrial enterprises. Article 25, 26 ▪ Standard for pollution control on the landfill site for domestic waste. GB16889/1997 ▪ Standards for treatment Engineering Project of Municipal wastes sanitary landfill. No. 101, 2001 ▪ Technical regulations for function and maintenance of Municipal wastes sanitary landfill. CJ /93/2003 ▪ Control standards for urban wastes for agricultural use. GB8172/87 ▪ Technical regulations for function maintenance and safety of municipal solid waste composting plant. CJJ /T 86/2000 ▪ Technical evaluating targets on municipal solid waste composting plant. CJ/T3059/1996 ▪ Standards for treatment Engineering Project of Municipal wastes sanitary landfill. No. 213, 2001 ▪ Technical specification for static aerobic composting of municipal solid waste. CJJ/T52? 1993 ▪ Standard for pollution control On the municipal solid waste incineration. GWKB3? 2000



Local Policies - 2

Landfill	<ul style="list-style-type: none"> ▪ National Standard of the People's Republic of China. ▪ Standard for pollution control on the landfill site for domestic waste.
Incineration	<ul style="list-style-type: none"> ▪ Pollution control standard for hazardous wastes incineration.
Hazardous wastes (Industrial)	<ul style="list-style-type: none"> ▪ Identification standard for hazardous wastes -- Identification for corrosivity. ▪ Identification standard for hazardous wastes -- Identification for toxicity. ▪ Standard on poly chlorinated biphenyls for wastes. ▪ Standard for the designing of industrial enterprises. Article 26 ▪ Pollution control standard for hazardous wastes incineration.
Hazardous wastes (Medical)	<ul style="list-style-type: none"> ▪ Identification standard for hazardous wastes -- Identification for corrosivity. ▪ Identification standard for hazardous wastes -- Identification for extraction procedure toxicity. ▪ Standard on poly chlorinated biphenyls for wastes.
Hazardous wastes (Others)	<ul style="list-style-type: none"> ▪ Identification standard for hazardous wastes -- Identification for corrosivity. ▪ Identification standard for hazardous wastes -- Identification for extraction procedure toxicity. ▪ Standard on poly chlorinated biphenyls for wastes.



Provincial Policies - 1

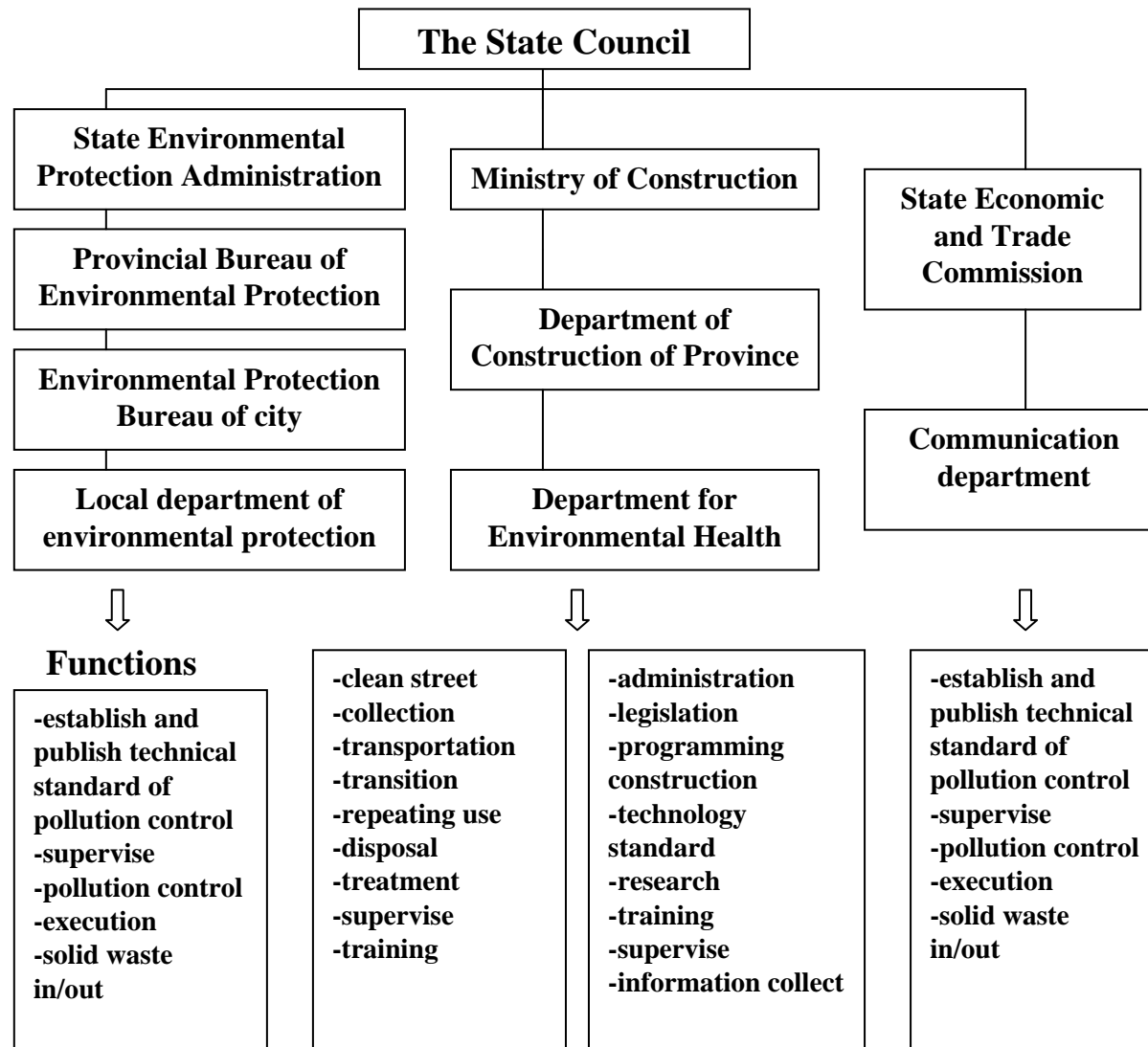
	Policy Documents
General	<ul style="list-style-type: none"> ▪ Environment Protection Act of Jiangsu Province. Article 27 ▪ Urban special refuses management rule of Wuxi City. Article 2 ▪ Urban Appearance and Environmental Hygiene management Act. No. 101, 1992 ▪ Strategy and Action Plan for Municipal Solid Waste Management. - 1993 - ▪ Urban Appearance and Environmental Hygiene management Act. - 1992.8.1-
Garbage Classification	<ul style="list-style-type: none"> ▪ Environment Protection Act of Jiangsu Province. Article 34 ▪ Urban special refuses management rule of Wuxi. Article 6
Collection and Storage	<ul style="list-style-type: none"> ▪ Urban special refuses management rule of Wuxi. Article 8
Transportation and Administration	<ul style="list-style-type: none"> ▪ Environment Protection Act of Jiangsu Province. Article 35 ▪ Measures for Implementation of Work Safety Licenses of Hazardous Chemical Production Enterprises of Jiangsu Province. Article 3, Chapter 6 ▪ Urban special refuses management rule of Wuxi City. Article 9, 12
Treatment and Disposal	<ul style="list-style-type: none"> ▪ Urban special refuses management rule of Wuxi City. Article 14 ▪ The regulations on franchising for civil public utilities. No.126 ▪ The documents on franchising for the License of Municipal Waste Treatment. No.162 ▪ Measures for the License Administration of Qualification for Operation of Environmental Pollution Control Facilities. No. 23 ▪ The notion for enhancing the construction and management of municipal solid waste disposal plants. No. 225, 2004 ▪ The notice of implement charge system for municipal solid waste disposal to facilitate industrialization on solid waste disposal.



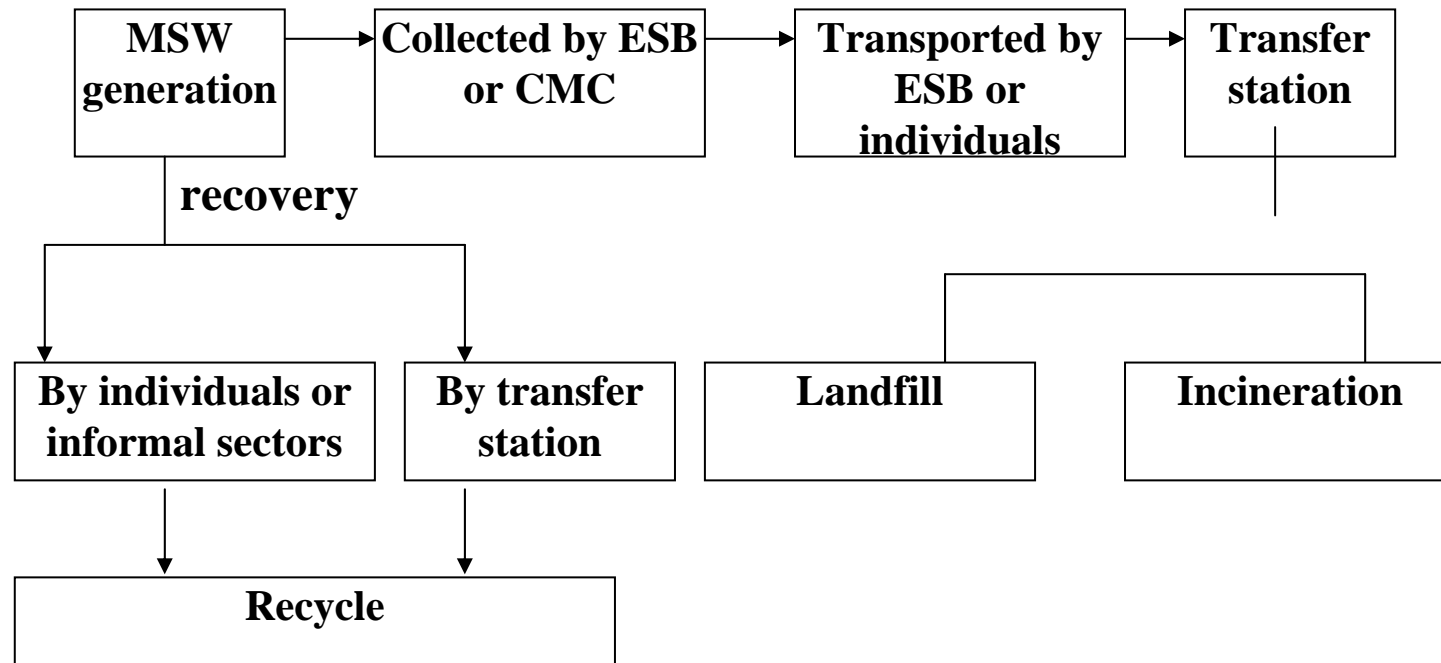
Provincial Policies - 2

Incineration	<ul style="list-style-type: none"> ▪ Catalogue for the Guidance of Foreign Investment Industries. Article 27, Chapter 16 ▪ The document on waste incineration for electricity by The national development and reform committee
Recycle and Reuse	<ul style="list-style-type: none"> ▪ Environment Protection Act of Jiangsu Province. Article 34 ▪ Technical Policy of Municipal Solid Waste Treatment and Pollution Prevention. No. 120
Hazardous wastes (Industrial)	<ul style="list-style-type: none"> ▪ Environment Protection Act of Jiangsu Province. Article 35 ▪ Measures for Implementation of Work Safety Licenses of Hazardous Chemical Production Enterprises of Jiangsu Province. Article 7, Chapter 6 ▪ Strengthen administration of Hazardous Municipal Waste displace ▪ Measures for Implementation of Work Safety Licenses of Hazardous Chemical Production Enterprises.
Hazardous wastes (Others)	<ul style="list-style-type: none"> ▪ The inform for strengthen administration work of Hazardous Waste displace ▪ Urban Appearance and Environmental Hygiene management Act of Wuxi City. Article 37
Constrution, Demolition and Eviction	<ul style="list-style-type: none"> ▪ Urban special refuses management rule of Wuxi. Article 2 ▪ The rule for Municipal Construction Solid Waste administration of Jinagsu Province.

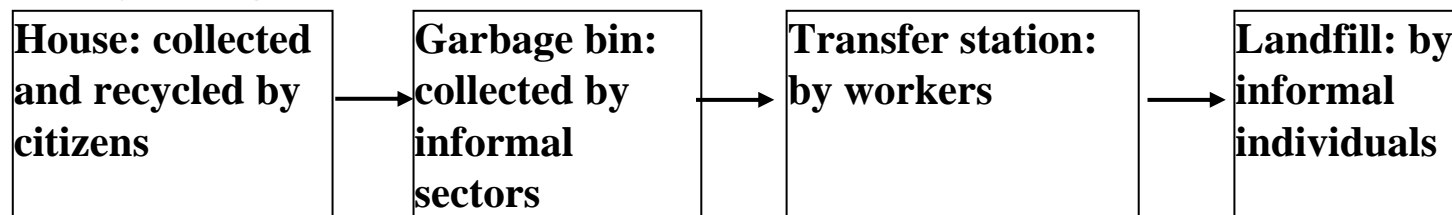
Institutional Arrangements



Operational Stages (MSW)



Recycling Process

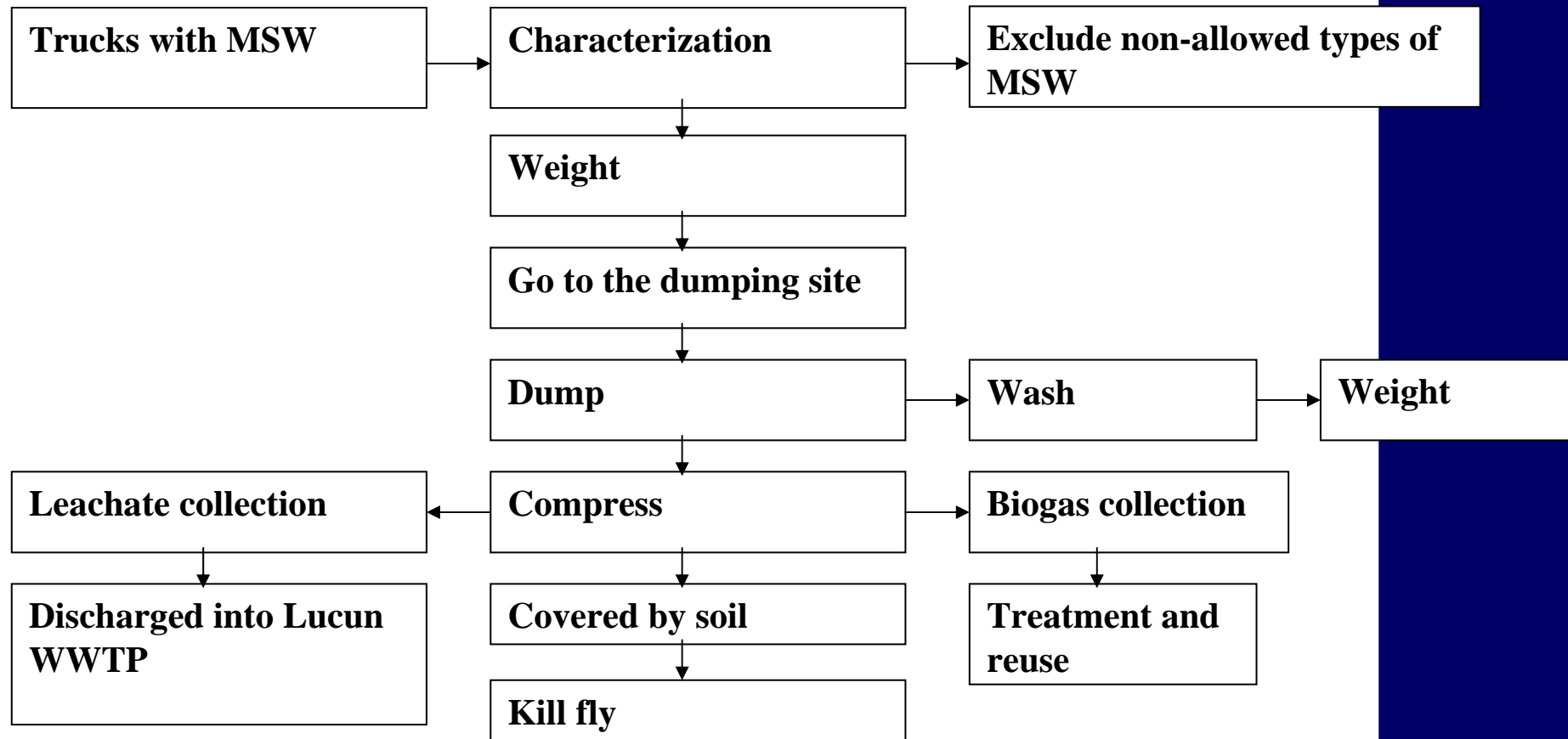


Technology (MSW)

- Garbage bins and residential trash storage – communities to transfer the waste through small carts & vehicles (open and basic)
- Seven transfer stations – Environmental Health Department / Environment has covered waste collection vehicles for transporting waste for incineration and/or landfill
- Simple compacting facilities in Jingyi Road Transfer Station
- About 29% (120tons/day) for safe landfill
- About 45% (186 tons/day) for incineration
- Rural areas may still practice open dumping as 26% (109 tons/day) is not yet collected



Sanitary Landfill



Peach Blossom Mountain MSW Sanitary Landfills covers 406 acres and was built in 1998 costing 49.96 million RMB having designed life of 12-15 years – About 45 million tons of MSW has been disposed of by end of 2005



Incineration - 1

Yiduo Incineration Plant was built in 2003 costing 258 million RMB with a capacity of 1000 tpd waste disposal and 200 million kilowatt-hours electricity generation

Due to high moisture content in MSW, 20% of coal is required for incineration

Phase-II, expected to be completed by July 2007, will have an additional capacity of 250 tpd of MSW disposal and 500 tpd sludge drying and disposal from WWTP – and C12MW generator

Bottom-ash is about 50%-70% of in-feed mass or 15% of in-feed volume requires safe transportation for sanitary or safe landfill disposal or used for producing construction materials

Fly-ash is about 5% and due to its hazardous nature requires special and expensive treatment and disposal



Incineration - 2

MSW with 50% moisture content and low heat-value averaging 100Kcal/kg - The incineration time is above 3 seconds

The temperature is above 850°C and the oxygen amount is controlled at 6-8% - The residue waste < 0.5% after incineration

“Half Dry Method” removes sulfur and chlorine is used to accelerate the reaction of Calcium Hydroxide and gas – woodiness active carbon is added to remove the gas – de-dusting facility rate is 99.9% and the gas discharge meets EU standards

160oC to dry sludge from 80% to 40% moisture content

The facility is built on an automation system of “Europe 6000”

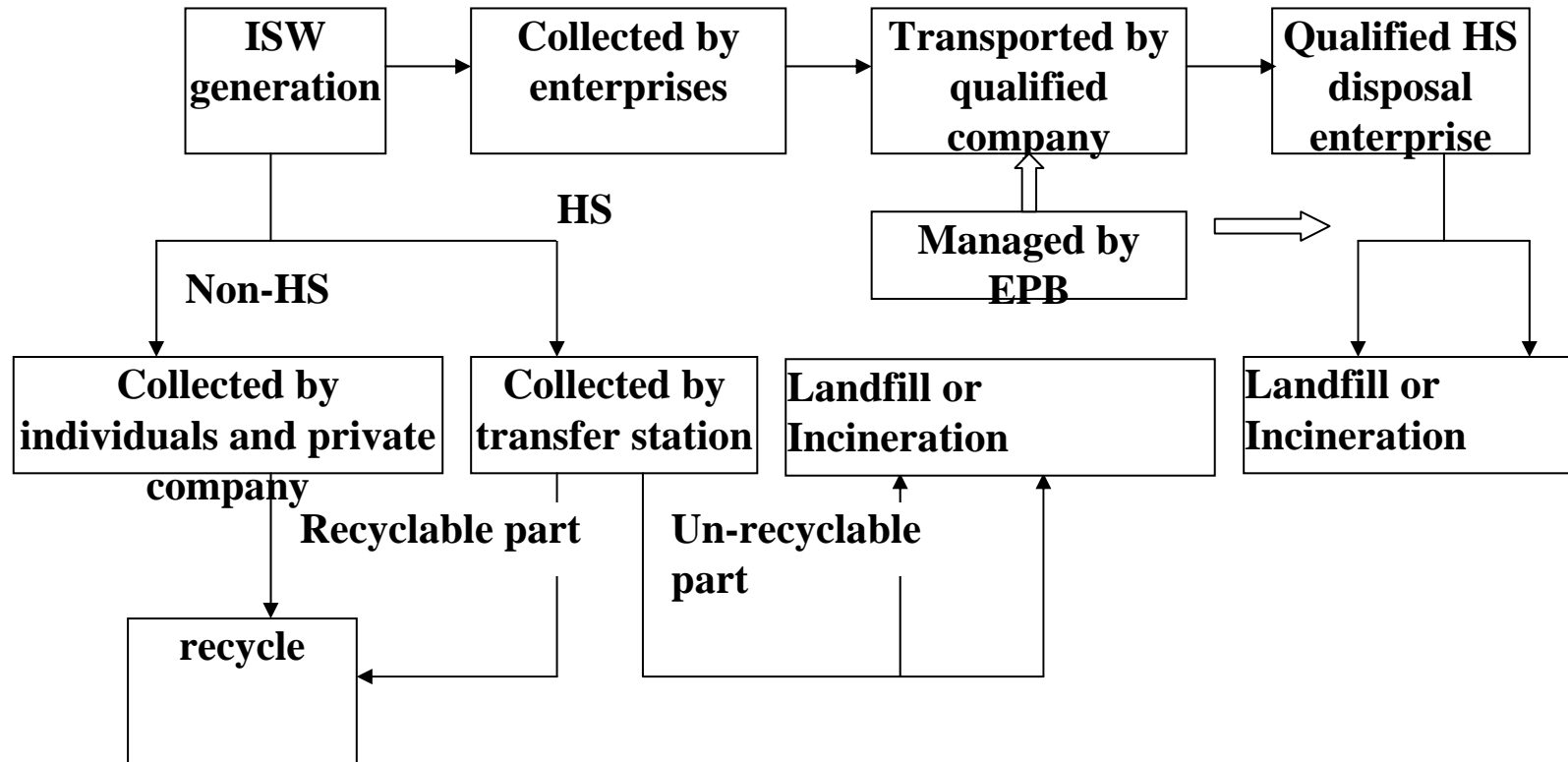
Annually, 360,000 of MSW and 360,000 tons of sludge is treated

Power generation and construction materials are obtained

Heat value of MSW, sludge and power generator is equal to 80,000, 30,000 and 50,000 tons of coal respectively



Operational Stages (ISW)



Hazardous Solid Waste Treatment

Hazardous waste is collected, treated and disposed of by specialized/qualified companies registered with provincial government

Fangtian EPC, hazardous treatment facility, covers 2767 square meters having sedimentation pool, oil-separating pool, oxidation trough, digestion pool, pre-aeration pool, transition pool, regulating pool, clarification pool, one set system of acidification-demulsification, one set of EX60W solvent reuse reactor, and UG-12-7-1 high efficiency membrane separating facility

Treatment capacity: 10,000 tpa of oil-wastewater, 200 tpa of waste acid and alkali liquid respectively and 100 tpa of waste organic solvent



Hazardous Solid Waste Landfill

The pre-treatment process includes checking, segregation and crush, and stabilization

Leachate is collected and treated before discharging into municipal wastewater system

The capacity of the landfill is 100,000 cubic meters

Three kinds of hazardous waste, including metal, acid/alkali wastes and inorganic waste are disposed

The moisture content is less than 40% and liquid waste is not allowed



Financing - MSW

7 RMB/person/month is deducted from salary

3 RMB/family/month for community committee to transfer waste up to transfer station

15 RMB/company/month from individually-owned businesses

Street	Financial budget (×1000 RMB)	Financial expense (×1000 RMB)
Wangzhuang street	1200	1200
Fangqian street	136	136
Meicun town	65	65
Shuofang town	265	265
Hongshan town	262	262
Nanzhan street	65	65



Financing - HSW

800-1000 RMB/ton and 300-1000 RMB/ton of liquor for incineration and disposal respectively at Zhongtian

300 RMB/ton for discarded emulsification liquor and 700-800RMB/ton of discarded acid of base liquor

Temporary price for disposing at secured landfill:

1.7 RMB/kg for ashes from incineration

2.8 RMB/kg for discarded batteries

9-12 RMB/kg for virulent solid waste

2.7 RMB/kg for heavy metals

1.6 RMB/kg for inorganic sludge



Financing Policies

Yiduo incineration plant do not have to pay taxes and government buys its electricity at 0.57RMB/kilowatt to encourage incineration based electricity generation

The private sector handles industrial waste

Polluter-pay-principle is also applicable to all the private businesses, government entities and others; however:

Joint-ventures and overseas-funded enterprises in high new district are free of this charge

Industries are charged at 1000 RMB/ton for hazardous waste only which is not treated at site

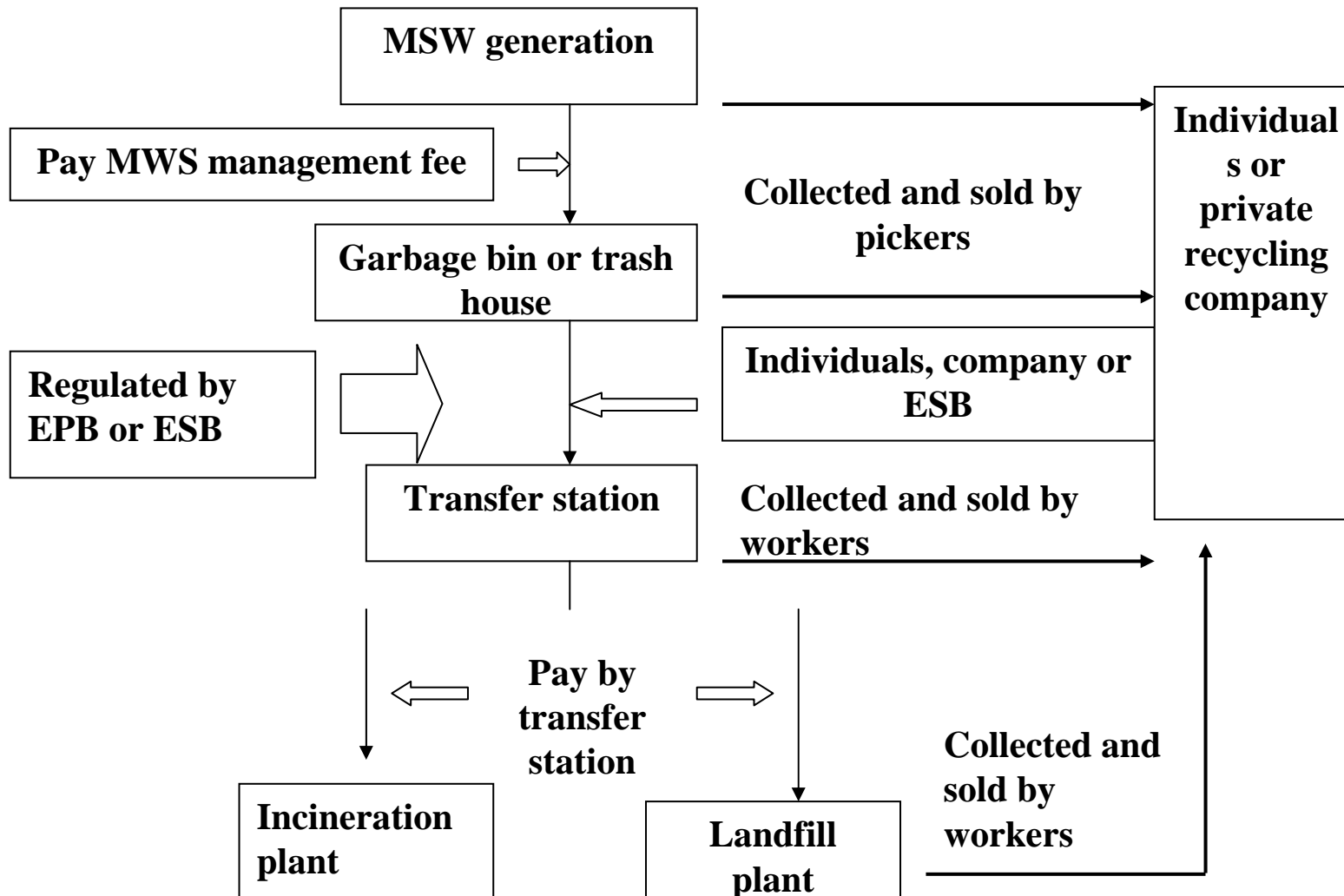


Stakeholders' Role

Waste streams	Management/ Operational Stage	Stakeholders
Municipal solid wastes	Collection and transportation	Citizen, citizen community committee, household management company, ESB, private transportation
	Reuse /recycling	Citizen, waste picker, workers in transfer station
	Incineration	ESB, incineration plant, EPB
	Landfill	ESB, landfill plant, EPB
Industrial wastes	Collection and transportation	Enterprises, transportation company, EPB
	Reuse /recycling	Enterprise, individuals, recycling company, partial environmental protection company
	treatment	Enterprises, environmental protection company
	Disposal...	Enterprises, landfill plant, incineration plant, EPB
Hazardous wastes	Collection and transportation	Enterprises, transportation enterprises, EPB
	treatment	Environmental protection company, institute, university, EPB
	incineration	environmental protection company, EPB
	Landfill	Safe landfill, EPB



Role in Recycling





Thank You...

