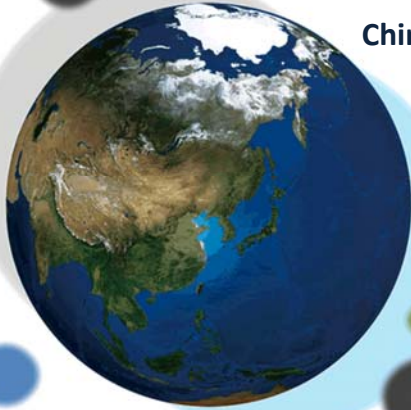




Examining Industrial Innovation Challenges in China through the Lens of Environmental Protection Industry

China Everbright International Limited – Chen Xiaoping
June 2013 (Hong Kong)



Examining Industrial Innovation Challenges in China through the Lens of the Environmental Protection Industry

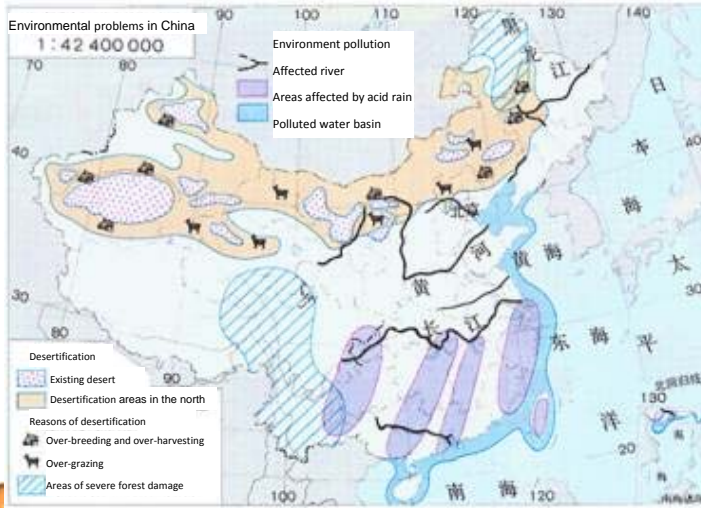
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1. Environmental Crisis in China

Rapid economic development underscores environmental problems in China

China's rapid economic development has caused destruction to the environment and waste of resources and has worsened environmental problems.



- Polluted river
- Areas affected by acid rain
- Polluted waters
- Desert
- Severely damaged forest

1. Environmental Crisis in China

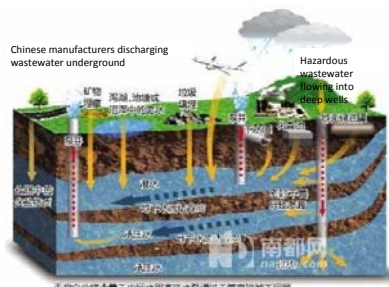
Water pollution (1)



Huaihe River water pollution



Cyanobacterial bloom in Dianchi Lake



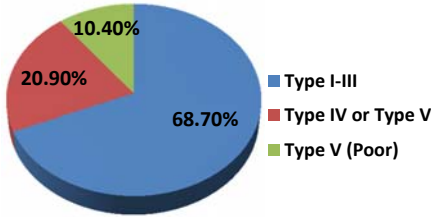
Weifang groundwater pollution



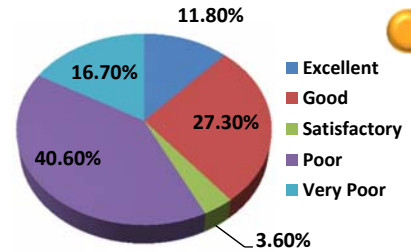
Red tide in Bohai Bay

1. Environmental Crisis in China

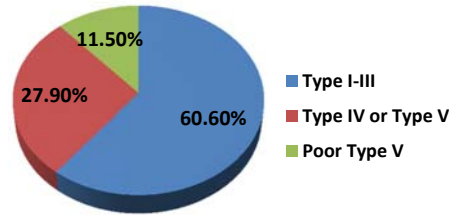
Water pollution (2)



Statistics on Water Quality of 10 Key River Basin in China



Statistics on Groundwater Quality in China



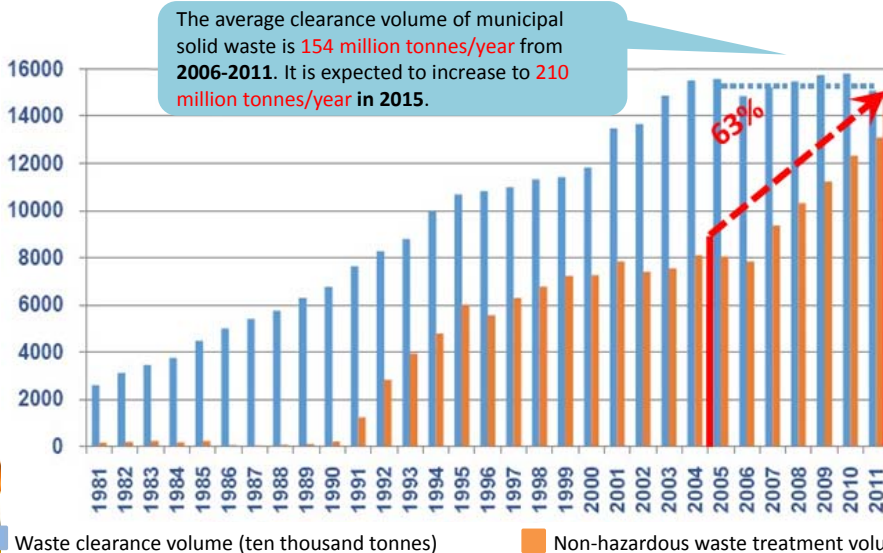
Statistics on Water Quality of 61 key Lakes and Reservoirs in China

Source: "Communique on Land and Resources of China 2012", Bulletin of China's Environmental Conditions 2012, Ministry of Environmental Protection.

1. Environmental Crisis in China

Solid waste pollution (1)

Urban waste piling up



Source: China Urban Construction Design & Research Institute



1. Environmental Crisis in China

- ✚ Solid waste pollution (2)
- ▶ Urban waste piling up (Beijing as an example)

Photo Exhibition of Wang Jiuliang in 2011 “Beijing Besieged by Waste”



Waste piling up outside a small community in Liyuan, Tongzhou District, Beijing

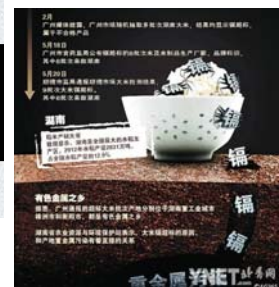
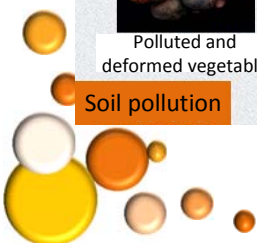
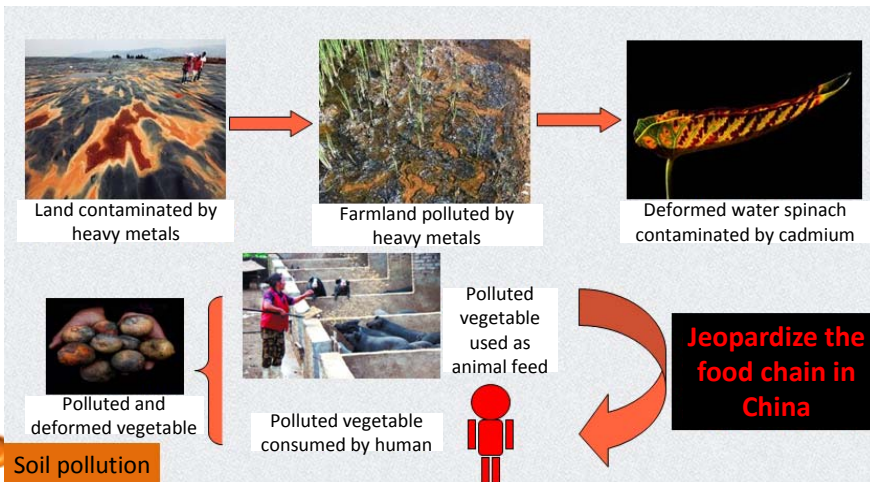


Note: The yellow marks indicate landfills of different scales



1. Environmental Crisis in China

- ✚ Solid Waste Pollution (3)
- ▶ Soil pollution (Cadmium-Tainted Rice Scandal)



1. Environmental Crisis in China

Air pollution (1)



1955, Los Angeles Photochemical Smog
(400 deaths)



1952, London Smog (12,000 deaths)



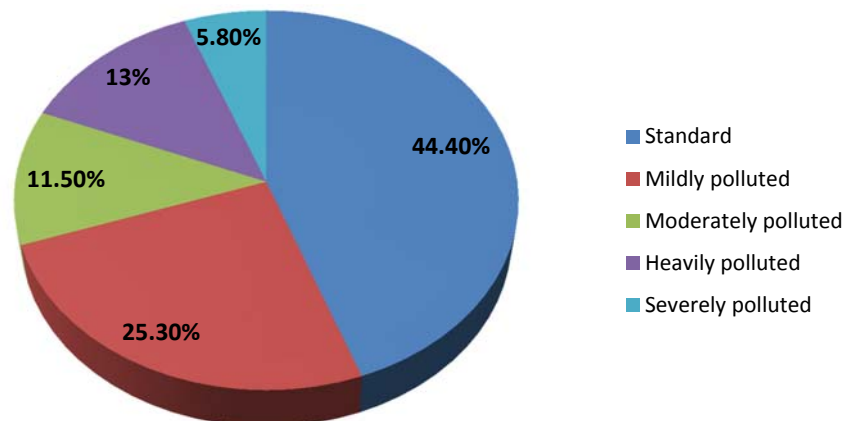
2012, Beijing Smog (?)



1. Environmental Crisis in China

Air pollution (2)

Air quality in 74 major cities in China in the first quarter of 2013

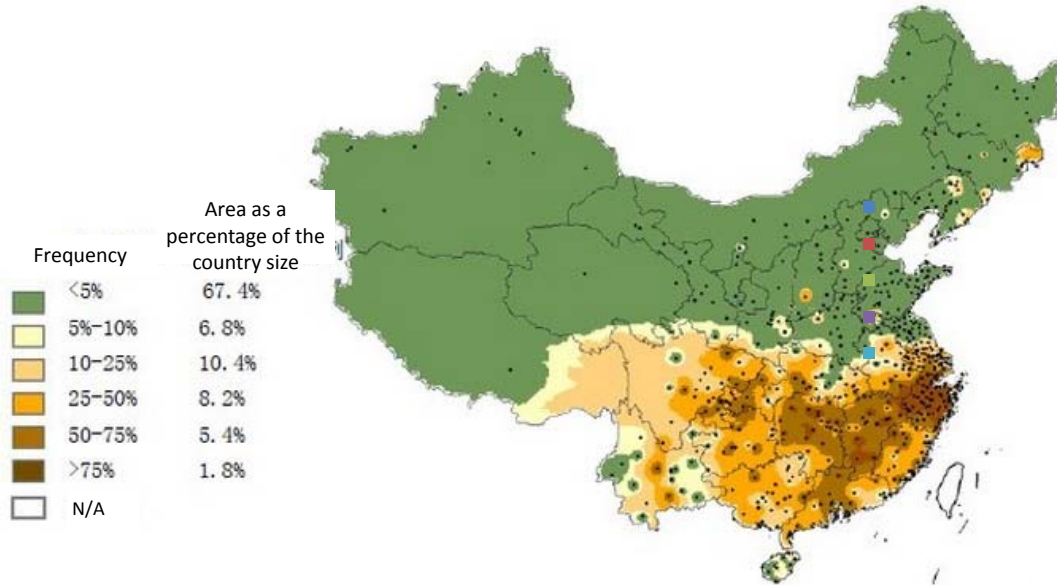


Source: Ministry of Environmental Protection of the People's Republic of China, "Air quality in 74 major cities in China in the first quarter of 2013"

1. Environmental Crisis in China

Air pollution (3)

2012 National Distribution of Acid Rain in China

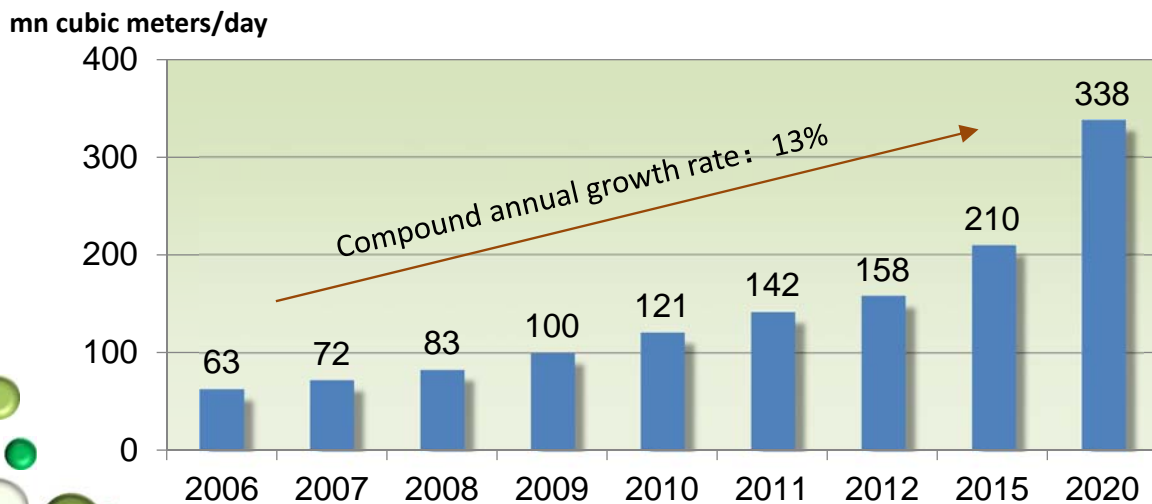


Source: China Environmental Monitoring Centre

2. Environmental Crisis Breeds Opportunities for Environmental Protection Business

Urban and rural sewage treatment (1)

Capacity of waste water treatment in China is growing rapidly

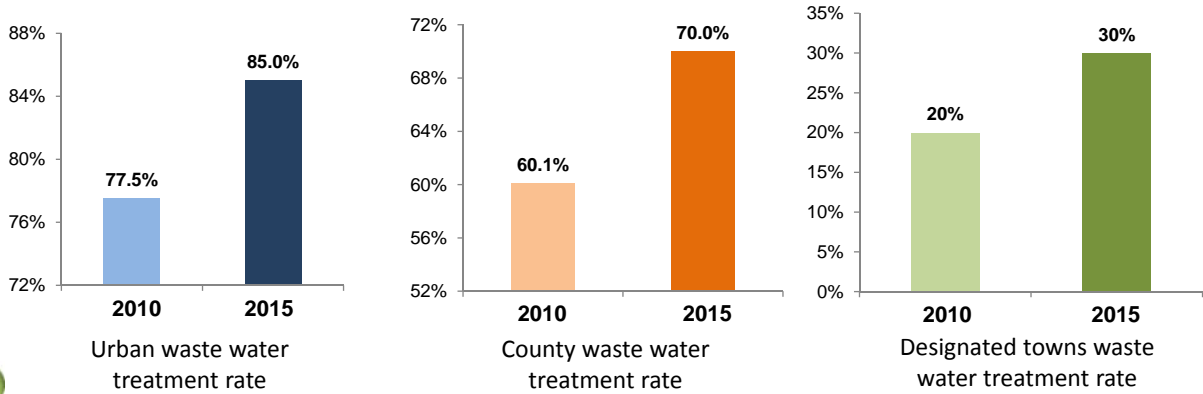


Source: Ministry of Housing and Urban-Rural Development of the People's Republic of China

2. Environmental Crisis Breeds Opportunities for Environmental Protection Business

Urban and rural sewage treatment (2)

Urban and Rural Waste Water Treatment Rate and Target (During the Twelfth Five Year Plan)

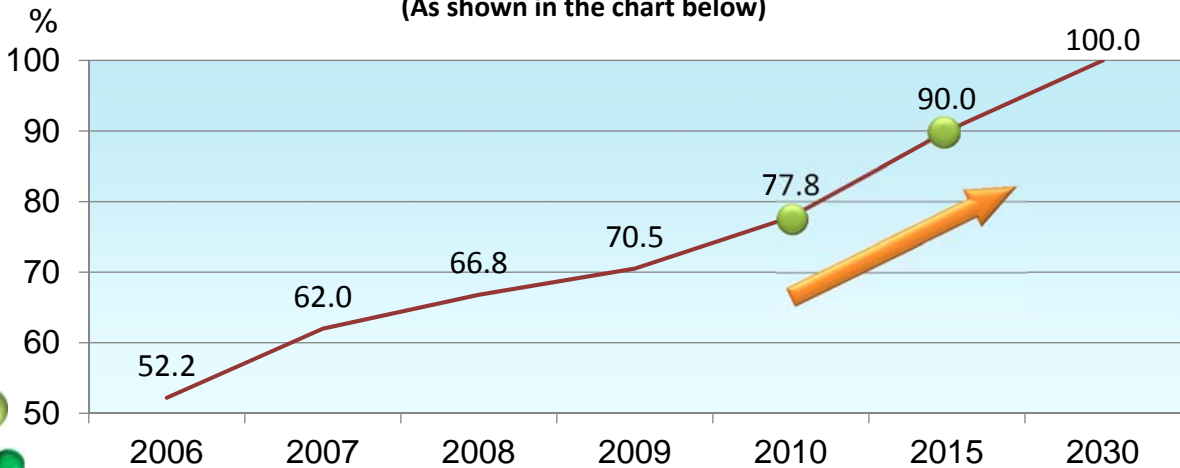


Source: Twelfth Five-Year Plan on National Urban Wastewater Treatment and Recycling Facilities Construction Program

2. Environmental Crisis Breeds Opportunities for Environmental Protection Business

Household waste disposal (1)

Non-hazardous treatment rate of urban household waste in China
(As shown in the chart below)

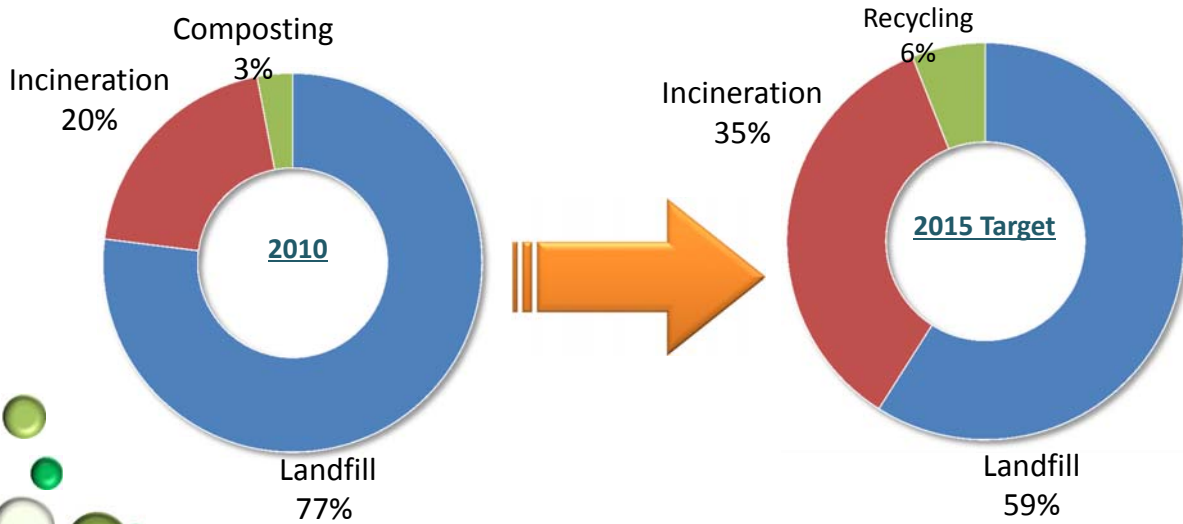


Source: United Nations Statistics Division, National Bureau of Statistics of China, Ministry of Housing and Urban-Rural Development

2. Environmental Crisis Breeds Opportunities for Environmental Protection Business

Household waste disposal (2)

The distribution of different non-hazardous treatment methods of urban household waste in China (see chart below)

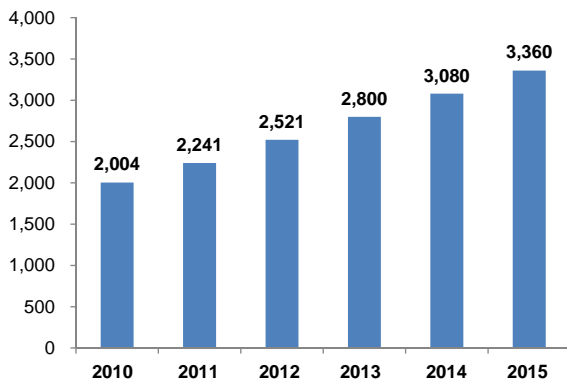


Source: The National Plan for the Construction of Facilities for Treatment of Urban Household Waste in a Non-Hazardous Way under the 12th Five-Year Plan

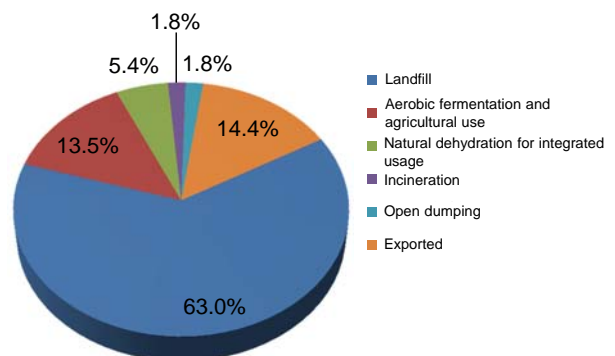
2. Environmental Crisis Breeds Opportunities for Environmental Protection Business

Sewage sludge disposal

Ten thousand tonnes



Wet sewage sludge produced by urban waste water plants in China (water content 80%) Generation and forecast (2010-2015)

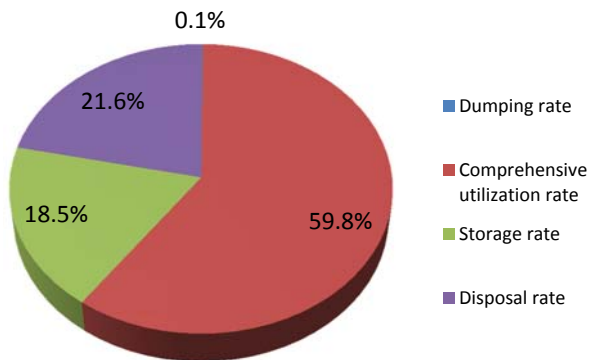


Ratios of different sludge treatment methods in China (2010)

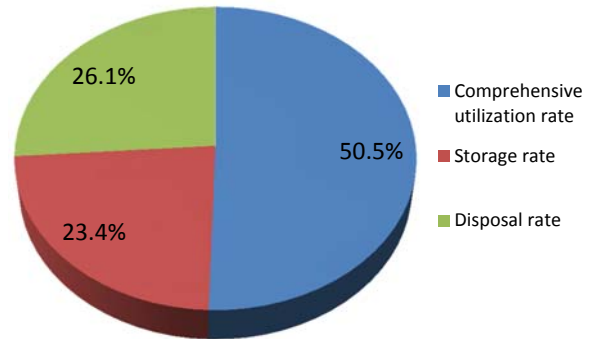
Source: survey data from h2o-china.com and quarterly figures from Ministry of Housing and Urban-Rural Development; "2013-2017 In-depth Survey and Investment Strategy Planning Analysis on Sludge Treatment and Disposal in China"

2. Environmental Crisis Breeds Opportunities for Environmental Protection Business

Industrial solid waste generation and treatment status



Ratios of common industrial solid waste treatment methods in China in 2011 (Generated a total of 3,265,370,000 tonnes)

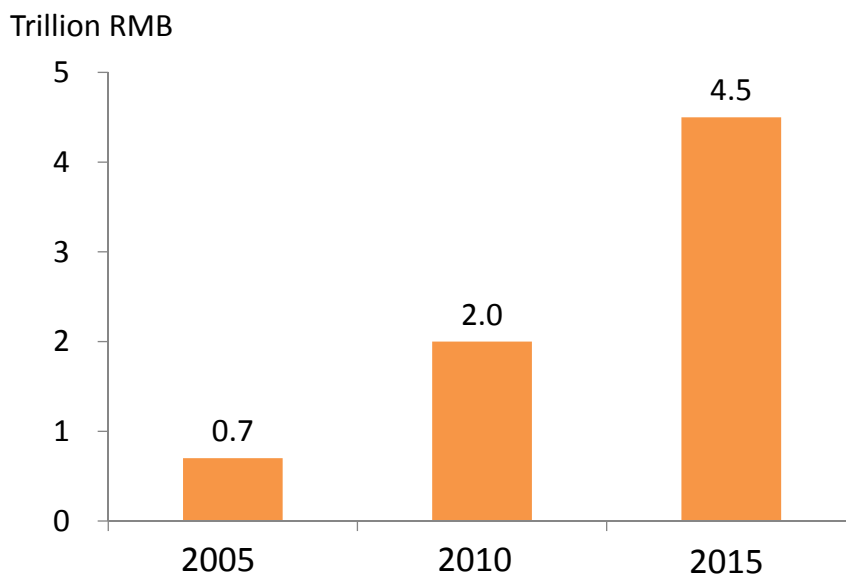


Ratios of hazardous waste treatment methods in China in 2011 (Generated a total of 35,140,000 tonnes)

Source: Ministry of Environmental Protection of the People's Republic of China, "Yearbook of Environmental Statistics 2011"

2. Environmental Crisis Breeds Opportunities for Environmental Protection Business

Environmental protection industry total value

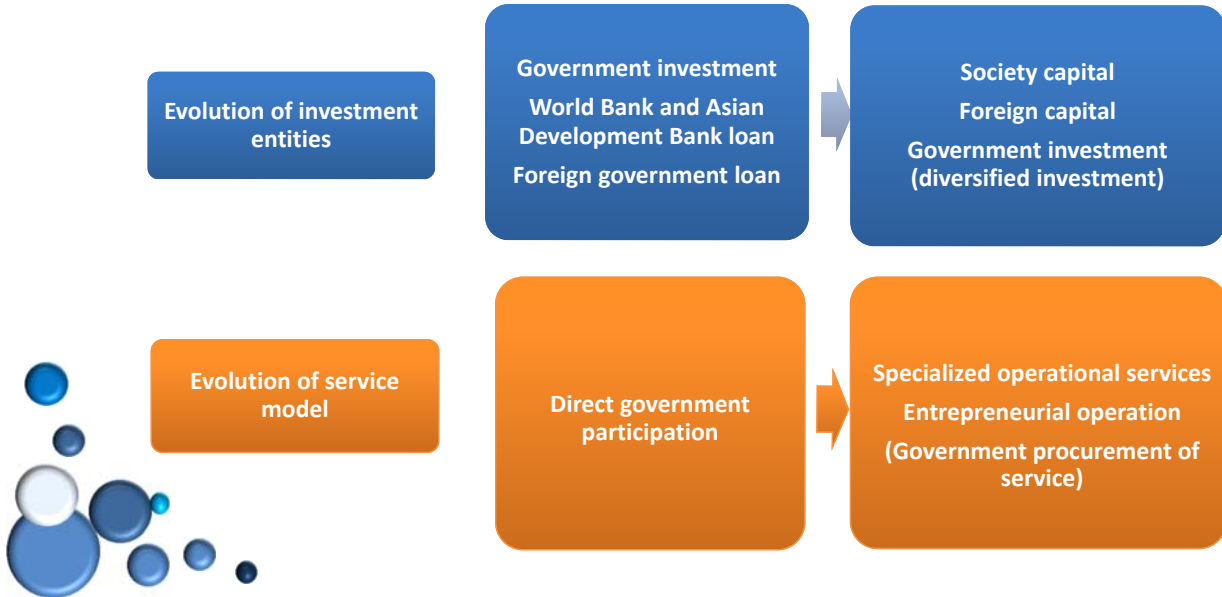


Source: the 10th, 11th and 12th Five-Year Plan for the Energy Conservation and Environmental Protection Industry

3. Innovation and Challenges in the Environmental Protection Industry in China

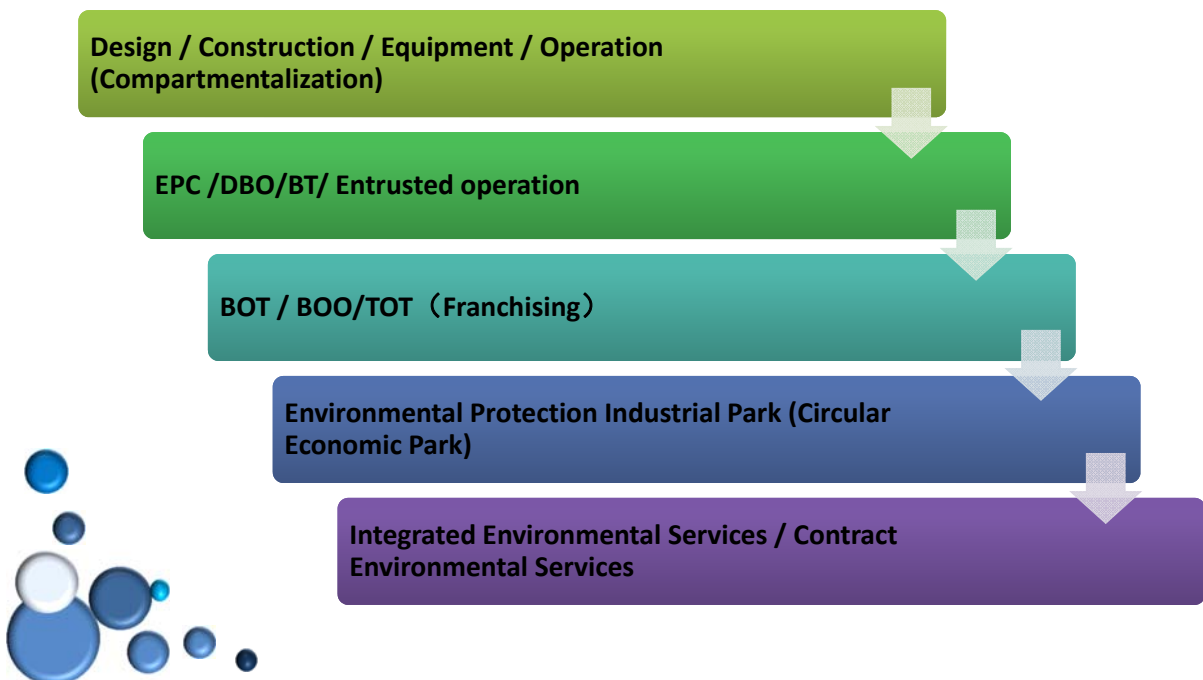
System innovation

The Ministry of Construction issued the “Opinions on Speeding up the Marketization Process of Public Utilities” in 2002



3. Innovation and Challenges in the Environmental Protection Industry in China

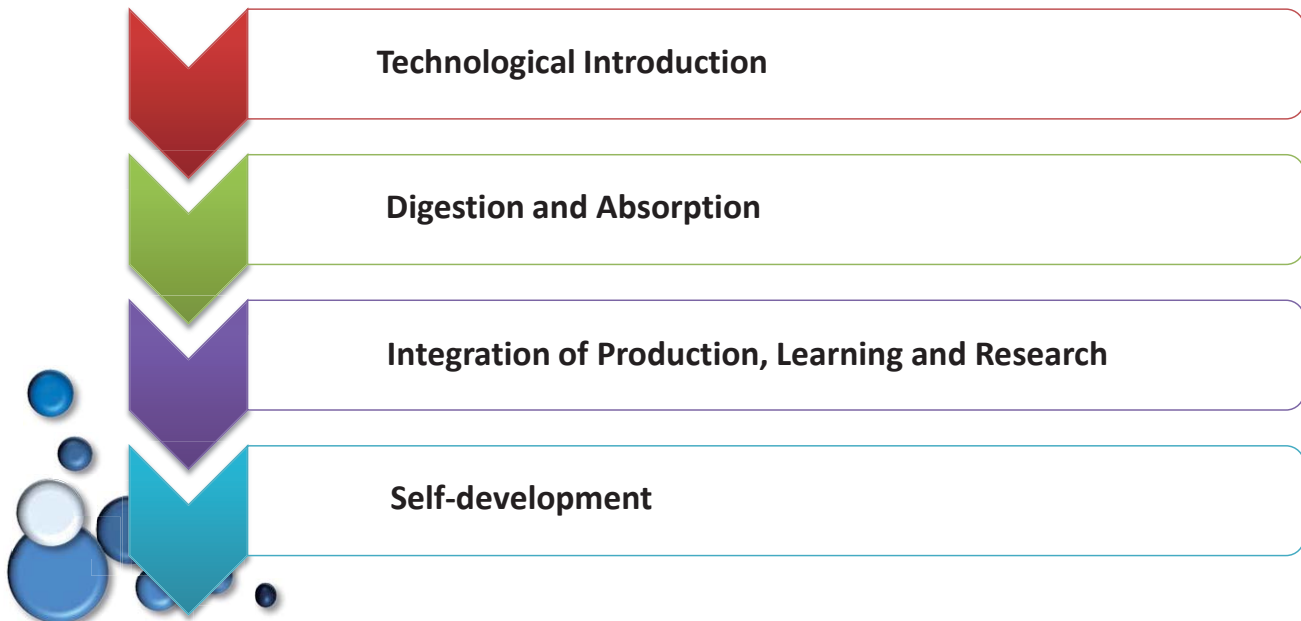
Business model innovation



3. Innovation and Challenges in the Environmental Protection Industry in China

✦ Technological innovation

Focusing on the characteristics of environmental protection industry in China



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3. Innovation and Challenges in the Environmental Protection Industry in China

✦ Industrial innovation challenges (1)

Challenges in System Innovation

- Local protectionism still exists
- Project bidding market has yet to be regulated
- Market entry and exit mechanisms have yet to be established
- Domestic capital market/stock listing system have yet to be improved

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3. Innovation and Challenges in the Environmental Protection Industry in China

Industrial innovation challenges (2)

Challenges in Business Model Innovation

- The design of national industrial policy is not compatible with the market environment
- Tax incentives and other complementary policies are extremely backward

Challenges in Technological Innovation

- Technological standards in some areas are extremely backward or even absent
- Use of research funding and conversion efficiency have yet to be improved
- A severe lack of corporate innovation capability and resources
- A lack of intellectual property protection

3. Innovation and Challenges in the Environmental Protection Industry in China

Everbright International's practice of innovation in the environmental protection industry in China (1)

Technological innovation



Mechanical grate boiler



Fuel gas purification system



Landfill leachate treatment system



Reusable water



Water source heat pump

3. Innovation and Challenges in the Environmental Protection Industry in China

Everbright International's practice of innovation in the environmental protection industry in China (2)

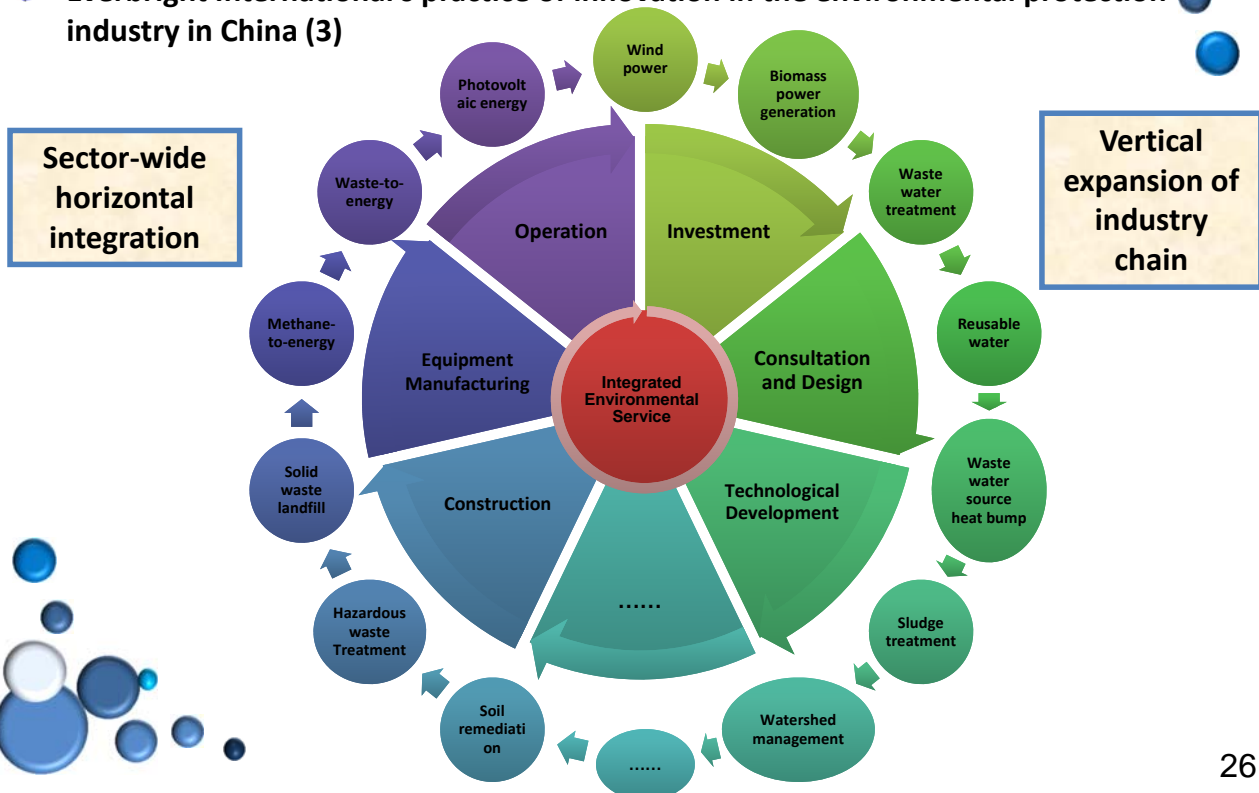
Business model innovation

Environmental Protection Veinous Industrial Park Model



3. Innovation and Challenges in the Environmental Protection Industry in China

Everbright International's practice of innovation in the environmental protection industry in China (3)



Examining Industrial Innovation Challenges in China through the Lens of Environmental Protection Industry

✦ Conclusion (1)

The environmental protection industry innovation is still faced with many challenges in the system, business model, and technological innovation.

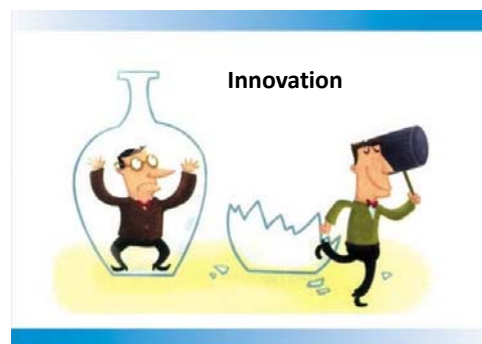
I believe that the solution to the environmental crisis in China is not about solving technical or funding issues, rather, it is about the government's courage and determination to improve the environment, and ultimately the public's awareness to protect the environment and take responsibility for our actions



Examining Industrial Innovation Challenges in China through the Lens of Environmental Protection Industry

✦ Conclusion (2)

I believe that the environmental protection industry will become a new driving force for the industrial development in China



Thank you!

