China Environmental Protection Industry Overview Report 2008

by

China Economic Indicator

Understanding China's Economic Indicators

1 Table of Contents

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3 Industry Snapshot

For many years the importance of China's economic growth far outweighed the environmental consequences of that growth. Urbanisation and industrialisation have resulted in environmental degradation country so serious that 16 of the world's 20 most polluted cities are in China.

In response to this growing threat, the Chinese government's objectives, as detailed in China's 11th Five-year Plan for Environmental Protection (issued on November 22, 2007) are threefold.

- To place equal emphasis not only on economic growth, but also on environmental protection.
- The second objective is to shift strategies for economic growth towards development that promotes environmental protection, not degradation.
- The third objective is administrative and attempts to apply more comprehensive legal, technological and necessary administrative frameworks to better facilitate and enforce environmental protection policies.

With the Chinese government promising to spend 1.35 percent of its gross domestic product (GDP) over the next three years on environmental protection projects, a broad range of market opportunities have presented themselves.

Local players are unable to meet the demands of the relatively new, booming, domestic market and China relies on imports for advanced equipment and high technology. In addition to this, China's World Trade Organisation (WTO) accession has accelerated legal and regulatory reform measures that play an important role in guaranteeing fair competition in the local market.

Foreign companies are increasingly entering this growing market, and foreign products and services are both popular and competitive. Internationally active firms are predominantly from the United States, Europe, and Japan, and competition is fierce.

This sector report provides an operational overview of the Chinese environmental sector, focusing mainly on market development and strategies. Investigating the whole sector, the report aims to determine the business opportunities for foreign companies and help investors target markets.

4 Environmental protection

4.1 Introduction

China's determination to generate growth to improve the material lot of its population for many years was pursued at any cost; not least that of the environment. Over the past few decades, first at the hands of its lumbering, State-owned industries, and later as at unseen consequence of its market-socialist reform, China's environment has become the victim of a wide number of environmental issues.

In spite of bold goals outlined in the 11th Five-Year Plan, it remains to be seen how effectively China can implement them and incorporate them into their economic development plans for the future.

China's acute environmental problems stem from a deteriorating natural resource base, dense population, heavy reliance on soft coal, outmoded technology, under-priced water and energy, and breakneck industrial growth. The World Bank estimates that health costs of air and water pollution in China amount to about 4.3 percent of its GDP. By adding the non-health impacts of pollution, which are estimated at approximately 1.5 percent of GDP, the total cost of air and water pollution in China is about 5.8 percent of GDP.

Dominated by hostile geographic terrain, half of China's population lives on only 13.5 percent of its land. Since only 10 percent of China's land is arable, a mere 7 percent of the world's cultivated land feeds 22 percent of the world's population.

China's environmental problems have become a global issue with nations embarking upon multilateral efforts to reduce greenhouse gas emissions. No country exists in isolation; China's airborne particle pollutants settle in Japan and are even partially to blame for Los Angeles' smog cloud. Pollutants originated in China have even been located as far away as Lake Tahoe in the western United States.

The 10th Five-year Plan failed to meet its objectives to reduce total pollution discharge by 10 percent from 2000 levels and instead saw only a 2.1 percent reduction in CO2 emissions and an actual 27.8 percent increase in SO2 emissions that it set for its 2005 target [unsure how to unpack this sentence-MS]. Through edicts in the 11th Five-year Plan, the government has unleashed new rounds of environmental legislation and called for the shut down of thousands of factories with the aim of once again reaching a 10 percent reduction of the 2005 levels of emissions for CO2 and SO2. Still, local enforcement of environmental laws is spotty, and investment in pollution control infrastructure is inadequate.

Competition from domestic firms in the environmental protection field is increasingly strong. Products enjoying the best sales prospects include low-cost flue gas desulphurisation systems, air and water monitoring

instruments, drinking water purification products, vehicle emission controls and inspection devices, industrial wastewater treatment equipment, and energy efficient and resource recovery technologies.

Government policy and policy-making organs

4.1.1 The structure of environmental authorities

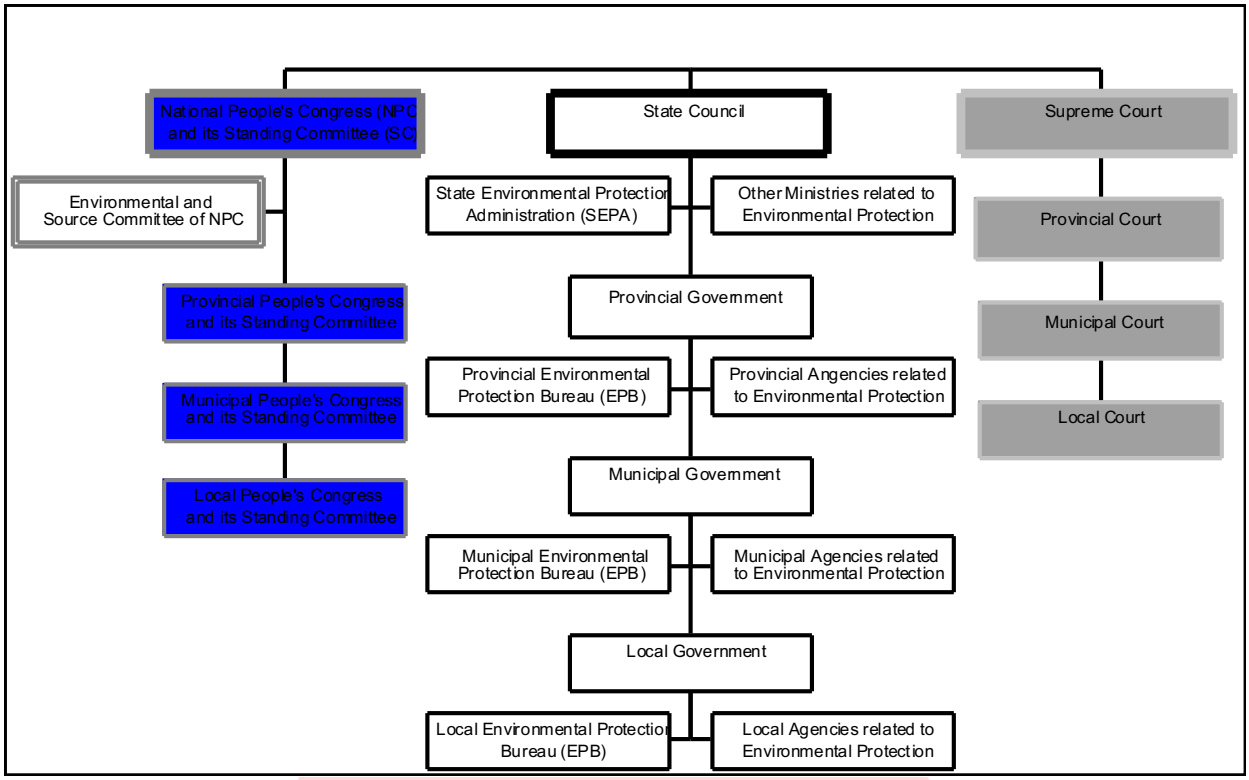
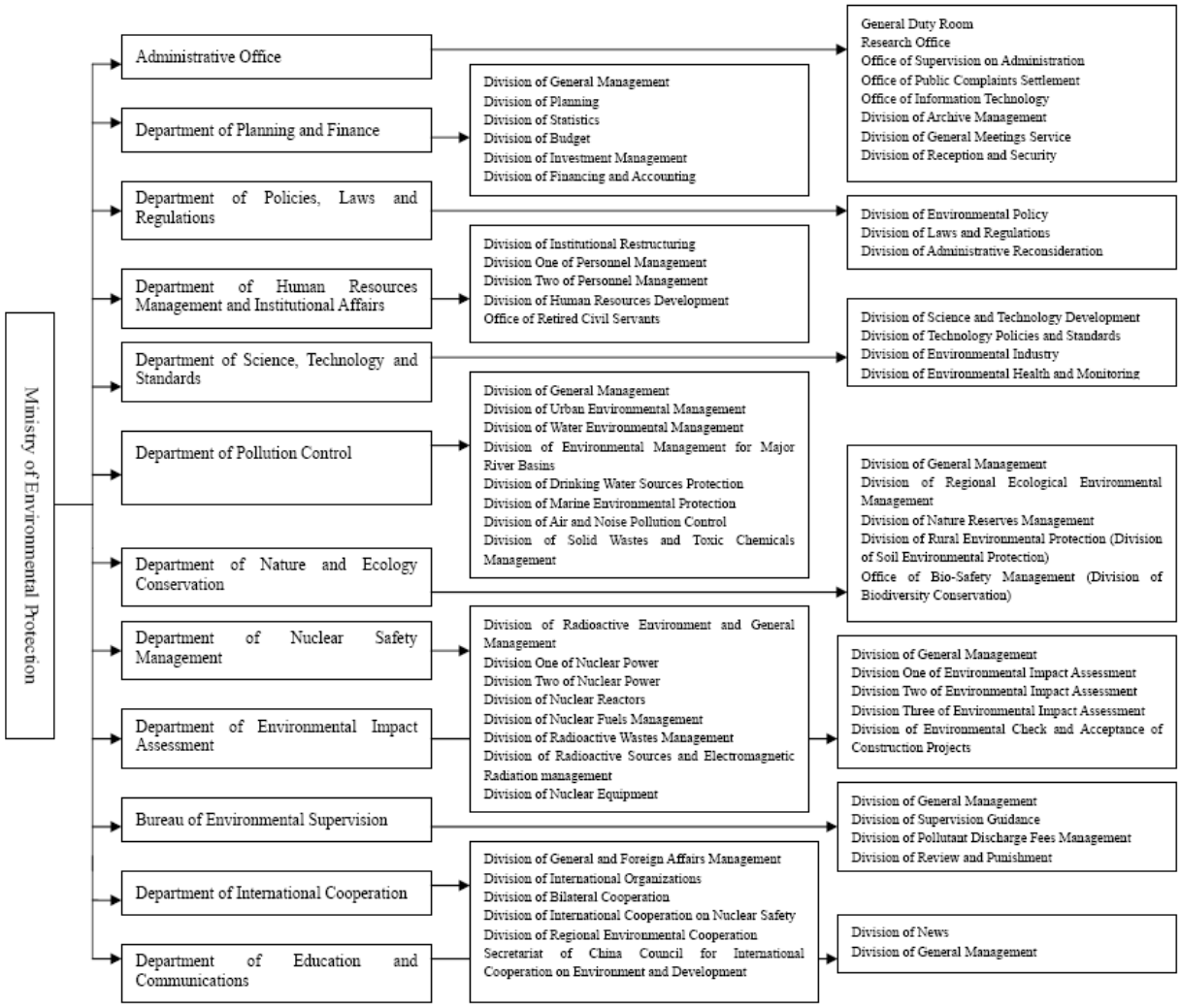


Table 2.2.1.1 the structure of environmental authorities



Source: SEPA

4.1.2 Legislative and judicial authorities

In China, only the National People's Congress (NPC) and its Standing Committee (SC) have the power to legislate laws, though in practice most laws derive directly from central directives. New laws and amendments must be adopted and promulgated by either of these two authorities.

Courts at all levels are judicial authorities, in charge of enforcement of environmental laws under their own jurisdiction. If disputes related to environmental protection arise between two parties, parties can go to the Environmental Protection Bureau (EPB) or directly to court. However, the power of Chinese courts to challenge entities with vested state interests is often stronger on paper than in reality. Ultimately, local officials choose GDP growth over enforcement of environmental laws because it figures more prominently in their Party evaluations.

4.1.3 Ministry of Environmental Protection (MEP)

Political power rests with the Communist Party, with governmental Ministries performing executive branch functions. The State Environmental Protection Agency (SEPA) was recently elevated to the ministry level and renamed as the Ministry of Environmental Protection (MEP) The most powerful environmental body in the country is the Environmental Protection Committee, which is a member committee of the State Council. [is this still true??] It is responsible for researching environmental protection and drafting environmental laws and regulations. The drafts of environmental laws or its amendments will be delivered to the National People's Congress or its Standing Committee, which can approve the drafts and promulgate them.

Beijing has good intentions in the environmental protection sector; these good intentions have, however, had a limited impact thanks to the vast, decentralised bureaucracy through which it governs the entire country. Much of the environmental protection rhetoric generated at the national level dissipates as it diffuses through the multi-layered state structure, producing outcomes that have little concrete effect.

Although SEPA has been elevated to Ministry status, it remains underfunded and understaffed. It must battle for influence with other agencies, such as the Construction Ministry that handles water and sewage treatment. Bureaucratic rivalries mean there is no cooperation and no sharing of the often patchy data collected with limited funds.

Around the country, local branches, known as Environmental Protection Bureaus (**EPB**), are supposed to monitor pollution, enforce standards, and collect fines. However their loyalties lie with their local governments, whose priorities are to maintain growth and employment in their jurisdiction. Furthermore, without funding many of the EPBs actually depend solely on the fines they collect from polluters to operate and pay staff. This leads to perverse incentives where the EPBs become dependant on those they are supposed to punish.

The 11th Five-year Plan recognises these shortcomings and current administrative limitations of environmental protection body and has set forth provisions to improve it. The plan aims to: make institutions responsible for environmental protection; carry out their responsibilities by enhancing national level supervision; strengthen local supervision; apply both constraining and incentive mechanisms in order to facilitate greater corporate responsibility; and work toward greater interdepartmental co-operation between and within different levels of government. Efficacy of the plan has yet to be measured

MEP not only enforces environmental laws, but also works as an intermediary and maintains contact with international governmental and non-governmental organisations (**NGO**) as well as granting environmental licenses. Its International Cooperation Division and Foreign Economic Cooperation Office both concentrate on international cooperation with foreign governments, international organisations, and other foreign agencies.

Some large foreign investment projects need to be approved by the International Cooperation Division and executed by the Foreign Economic Cooperation Office.

4.1.4 Other governmental bodies

Besides these vertical environmental authorities, horizontal agencies take responsibilities related to environmental issues at each level. The State Planning Commission, State Economic Commission, Ministry of Construction, State Science and Technology Commission, Ministry of Water Conservancy and State Environmental Sanitation Commission are subordinate commissions under the State Council. Some of the administrative functions they execute regard environmental protection. These overlapping and often conflicting jurisdictions can lead to administrative inefficiency and conflicts of interest.

4.1.5 Other institutions

Some environmental research institutes, universities, and other non-government organisations (NGOs) also investigate the environmental sector. They are not governmental agencies, and have no power. Normally their research provides information for special studies, statistics, and legislation. Their roles generally focus on the prevention and control of pollution and improving public awareness. Some have been able to utilize 'soft-power ' to mobilize people and attract media attention to various causes ultimately helping to stop projects like the controversial dams in the southwest.

4.2 Key environmental policies

Key environmental policies at a national level as established by the 11th Five-year Plan are primarily centred on controlling the total emissions of major pollutants and ensuring safe drinking water in both urban and rural settings.

Eight major focal areas are included in the National 11th Five-Year Plan for Environmental Protection. They are listed below with their subheadings as issued in the Plan:

(1) Reduction of CO2 emissions and improvement in the quality of water

- Ensure the achievement of CO2 reduction target
- Ensure safety of drinking water sources
- Facilitation of the prevention and control of water pollution of key river basins

(2) Reduction of SO2 emissions to prevent and control air pollution

- Ensure the achievement SO2 emission reduction target
- Comprehensive improvements in urban air quality
- Enhancement in the prevention and control of industrial waste gases
- Strengthening the prevention and control of vehicle emission pollution
- Intensification of noise pollution control
- Control in the emissions of greenhouse gases

(3) Control solid waste pollution and promote recycling and reuse of solid waste

- Implementation of projects to dispose of hazardous and medical waste
- Implementation of innocuous disposal of domestic garbage
- Promotion of comprehensive utilisation of solid waste

(4) Protection of ecological environment, improvement in level of security for ecological safety

- Development of national zoning for areas with 'ecological functions '

- Initiation of activities for the conservation of key areas with 'ecological functions '
- Development of quality for nature reserves
- Strengthening the conservation and safety management of species resources
- Intensification of environmental supervision on development and construction activities

(5) Control of Rural Environment, Promotion of the Development of New Socialist Countryside

- Focus on the prevention and control of soil pollution
- Comprehensive environmental control in rural areas
- Prevention and control of rural pollution

(6) Strengthening marine environmental protection, focusing on the prevention and control of pollution as well as ecological damage of coastal sea waters

- Work toward reducing pollutants from land-based activities
- Acceleration of pollution control in key sea areas
- Prevention and control of port and ship pollution
- Protect marine ecological environments
- Prevent and control marine environmental disasters

(6) Strict supervision and management to ensure nuclear and radiation environmental safety

- Improvement in the quality of construction of nuclear facilities and operation safety levels
- Improvement in management of radioactive isotopes and radiation devices
- Acceleration in control of radioactive pollution
- Improvement in prevention and control of electromagnetic radioactive pollution

(8) Enhance management capacity building and raise law enforcement supervision

- Establishment of advanced environmental monitoring and early warning systems
- Establishment of a complete environmental law enforcement supervision system

- Development of an environmental emergency response system
- Improvement in China's comprehensive environmental assessment capacity
- Development of the 'Jinhuan Project' (a national and local environmental protection information system)
- Strengthening the supporting capacity in the innovation of environmental science and technology

4.3 General sector information

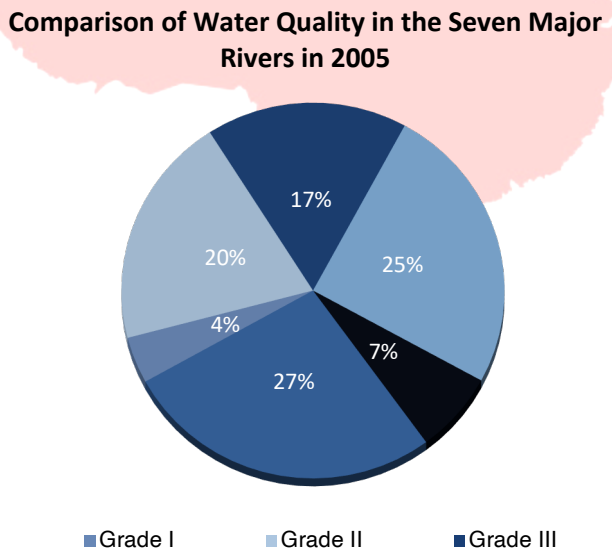
4.3.1 State of the Environment

According to State of the Environment report published in 2007 by the State Environmental Protection Administration (SEPA), China's general environmental condition has remained largely unchanged since the previous year. With worsening soil erosion, urban pollution, acid rain, and other environmental headaches, the situation is described as 'remaining stable '.

The quality of urban air, surface water, offshore sea water and the ecological environment either remained 'similar' or 'unchanged' or had 'no remarkable improvement', according to SEPA's annual report. More than half (54 percent) of the inland seas, lakes and river are of Grade IV quality or worse

According to the report, the seven major rivers and 25 out of the 27 major lakes in China were polluted. The Haihe River in north China is the most polluted river in the country, followed by the Liaohe River, Huaihe River, Yellow River, Yangtze River, and Pearl River.

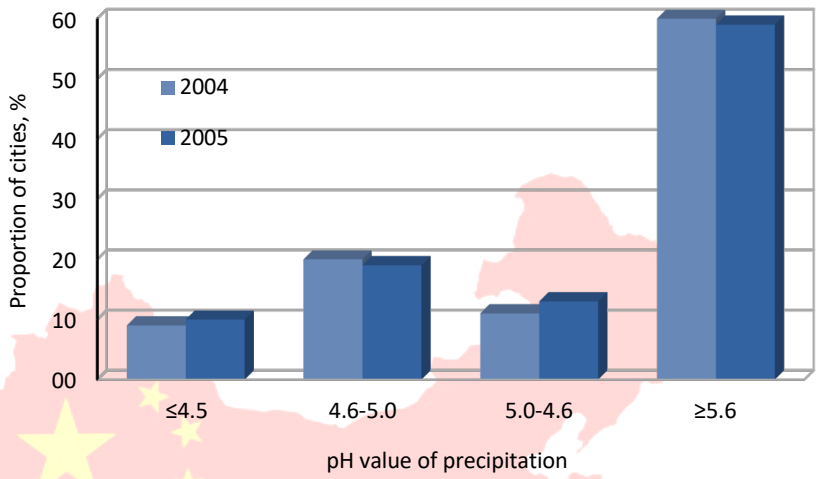
160 municipalities began monitoring underground water quality, of which 139 cities were at or above prefecture level and 21 at county level. The area of underground water monitoring sites totalled 1.11 million sq km.



Compared with the previous year, the overall quality of underground water in major cities is reported to have 'remained stable'. The monitoring results indicated that the pollution of underground water in the Northwest, the Northeast, and the Southeast areas worsened, 14 cities in North and Northwest China improved, and 123 cities witnessed stable underground water quality.

More Chinese cities than before suffered from acid rain as a result of increased air pollution. Among the 62 cities that have SO2 regulations, 45.1 percent had annual average SO2 levels meeting Grade II standards, an increase of 4.5 percentage points. 54.9 percent failed to meet Grade II standards, out of which 13 cities surpassed Grade III standards, comprising [huh? taking up?] 21.0 percent of surveyed cities and down by 8.7

3.1.2 Comparison of Water Quality in the Seven Major Rivers in 2005



percentage points. Of the comparable cities in acid rain controlled zones [huh? monitored cities or what? what is comparable city? what is an acid rain controlled zone], 73.9 percent had annual average SO2 levels meeting Grade II standard, up by 0.9 percentage points from the past year; and 4.5 percent failed to meet Grade III standard, down by 2.5 percent from the previous year. 218 cities reported serious acid rain (lower than pH 5.6), accounting for 41.4 percent of the total monitored cities.

Statistics of 500 Chinese cities show that only 32.33 percent of domestic sewage and 57.76 percent of domestic garbage was treated in these cities on average in 2004.

Facilities for waste treatment in Chinese cities are inadequate and unable to support current growth trends. In terms of sewage, the total discharge amount of wastewater across the country amounted to 52.45bn tons (among which the industrial effluent came up to 24.31 billion tons, and domestic sewage amounted to 28.14bn tonnes). The chemical oxygen demand (COD) emission totalled 14.142 million tons (including 5.548 million tons from the industrial sector and 8.594 million tons from domestic sources). 1.498 million tons of ammonia were released (including 525,000 tons from industrial sources and 973,000 tons from domestic sources) of which less than 35 percent was treated.

In terms of solid waste, 1.34 billion tons of industrial solid wastes were generated across the country, while the discharge of industrial solid wastes was 16.547mn tons, down by 6.1 percent compared with that of the previous year. The amount of industrial solid wastes under integrated reuse totalled 770 million tons, resulting in an integrated utilization rate of 56.1 percent, the same as that of the previous year.

Hazardous waste disposal, particularly medical waste, improved substantially but still remained at dangerously low levels, especially in rural areas.

The total area of land affected by water and soil erosion in mainland China reached 3.56m sq km, accounting for 37.1 percent of the total national territory. Of these 3.56m, 1.65m sq km were affected by water erosion and 1.91m by wind erosion. This erosion occurred mainly in mountainous areas, hilly land, and windy regions, especially in the middle and upper reaches of China's major rivers. It is estimated that 5 billion tons of soil are lost due to water and soil erosion across the country every year.

Urbanisation has been increasing at the rate of 4 percent in recent years, a phenomenon that has boosted productivity growth. This trend is likely to intensify if the *hukou* system-a residency permit system used to restrict migration--is abolished. About 43 percent of the population lives in urban areas. Important nation-wide policy differences between urban and rural areas have resulted in significant disparities between the populations in these areas. Increased urbanisation will raise energy consumption as well due to city dwellers using 3.5 times more energy on average than people in rural areas

Environmental problems are nothing new to China, but many of the problems have accelerated in the past two decades. In terms of international cooperation, China has seen a sharp increase in its efforts to enlist foreign expertise in attempts to tackle its environmental problems over the last ten years. Officials ascribe much of the worsening environmental problem to rapid industrialisation and economic growth.

4.4 Frequently Asked Questions (FAQs)

- **What environmental solutions does China need most?**

Environmental needs vary from region to region in China, but water and wastewater treatment, flue gas desulphurisation (used by coal-fired power plants to reduce sulphur dioxide emissions), energy efficiency improving technologies, and river basin management and flood control rank at the top of the list. Water reuse projects and sludge treatment and disposal are also high priorities for local planners.

Because environmental projects often lack funding, demand for market-based environmental solutions that allow investors to reap financial benefits is growing. Opportunities exist in the areas of environmental treatment, clean production, energy efficiency, and recycling and reuse technologies. Though local planners have shown an interest in industrial waste recycling and municipal waste composting, the market for recycled products remains small, and quality standards for these products are lacking. Demand for remediation of industrial sites is also growing since factories must relocate to make way for residential areas, but local governments have limited resources available for cleanup.

- **Which regions in China need which environmental projects most?**

Though it would be convenient to attribute environmental problems to specific regions in China, the nature of air, land, and water pollution are such that environmental problems tend not to stay in one place for very long. Generally speaking, northern China suffers from soil erosion, air-pollution, desertification, and drought; southern China suffers from silting and acid rain; industrial cities choke from air pollution; urban areas lack proper sewage and water treatment; and many of China's rivers and lakes are seriously polluted.

Fortunately, environmental projects are sprouting up throughout China, from dust control in Inner Mongolia to wastewater treatment in Chongqing, to hospital waste disposal in Shanghai. Beijing 's hosting of the 2008 Olympics has cast a spotlight on the city 's environmental protection effort, leading to a host of infrastructure, transportation, and conservation projects. Shanghai 's 2010 World Expo plans have spawned similar 'green' projects such as clean mass transit, energy-efficient buildings, and auto emissions control. To prepare for the Expo in 2010, Shanghai launched a three-year (2003-05) environmental protection plan that focuses on water, air, solid waste, forestation, industrial pollution, and agricultural contamination problems. Nearly 300 projects are planned, including several large sewage treatment plants along the Yangtze River and medium-scale plants on Hangzhou Bay.

Following the leads of Beijing and Shanghai, many cities and provinces have launched environmental protection campaigns to obtain funding from the central government or attract the attention of foreign investors. But many of these projects offer companies low returns on investment. Like much of China's

development, many of the reliable and well-funded projects are located in the coastal regions, where competition is intense.

- **How should my company approach World Bank- and Asian Development Bank-financed projects?**

It is important to identify projects that are likely to receive World Bank (WB) or Asian Development Bank (ADB) funding early in the process by networking with local design institutes, government authorities, foreign engineering firms, and bank project officers. Equipment requirements and specifications for these projects are usually identified before the loan is finalised, well before the tender opportunity is made public. Having a local presence in the market, either through a sales office or a sales agent, helps companies learn about projects early, introduces their technologies, and follow up as the project unfolds. Embassies and Consulate Generals may be able to help foreign firms through liaison officers at the WB and ADB. *(for a list of currently active World Bank projects, please see the Appendices)*

- **Is there much demand for environmental consulting services?**

Although consultants have traditionally had difficulty selling their services in China, the opening of China's services market to foreign competition, improved environmental standards and compliance requirements, and the demand for sophisticated technologies have led to more consulting opportunities. Many European firms have been successful in bundling consulting services with turnkey design-and-build projects. Some equipment providers offer free consulting services up front to develop sales later in the project. WB and ADB projects usually include substantial consulting and technical assistance components that are open to bids from international firms.

Though it may be difficult to sell consulting services to China's state-owned enterprises, the steady stream of foreign investment into China has created a niche for consulting services that offer their expertise to foreign manufacturers throughout the country. Foreign consulting firms that sell environmental due diligence, environmental health and safety, or environmental impact study services to major corporations outside China should consider offering these services to their clients' China operations, if they haven't already. Many environmental consulting firms target multinational corporations in China's burgeoning manufacturing, information technology, semiconductor, pharmaceutical, and petrochemical industries.

- **Is it true that the PRC government plans to invest billions of dollars in wastewater treatment?**

PRC government plans call for massive investment in this sector, but most projects are either financed in Chinese yuan or lack financing altogether. Foreign companies that want to access a larger portion of this market must be willing to accept local currency, make equity investments in projects, or offer competitive financing terms on equipment and technology sales.

Although multilateral bank loans represent a drop in the bucket compared to China's investment needs, there are several USD multimillion WB and ADB projects currently in the planning pipeline, including urban environmental planning, acid rain control, river basin management, and wastewater treatment in Anhui, Beijing, Jiangsu, Shanghai, Sichuan, and Zhejiang, to name a few projects. These projects usually offer international competitive bidding opportunities and payment in hard currency.

- **Do build-operate-transfer (BOT) projects make sense for wastewater treatment projects?**

BOTs are possible but there are few, if any, profitable BOT projects in China's wastewater sector. Because environmental projects perennially lack funding, local officials hope to attract foreign investment into this sector by offering 20-30 year operating concessions to foreign companies in return for building the facilities. Since the government commonly subsidises domestic treatment plant operation, domestic project planners and their foreign counterparts often disagree on the technology and investment required to turn a profit. Low tariff rates, fragmented fee-collection systems, irregular accounting practices, and lack of payment guarantees are key barriers to developing viable BOT projects. These projects make more sense in the water-supply sector where increasing demand combined with gradually rising water tariffs in residential, commercial, and industrial sectors make investment more attractive.

- **Are there any good environmental trade shows in China?**

There are a number of trade shows in China, but most of them are small and regional, and many are not well organised. The biannual China International Environmental Protection Industry Conference is the country 's largest and will take place in Beijing June 5-4, 2009 (*see* http://www.chinaenvironment.org/index_en.aspx). The conference will cover a wide range of sectors including air pollution, water, wastewater, solid waste, recycling, green transportation, and energy conservation. The Fifth Guangzhou International Environmental Protection Exhibition, which will occur November 19-22 (*see* www.gdepi.com.cn), is also broad in scope. The China Environmental Protection Industry Association plans to organise a large show in Shanghai in October 2004 [2008? 2009?-MS]. Foreign firms should consider participating in technical seminars and conferences to network and learn the latest trends. Local government bureaus are often eager to co-organise workshops and technical seminars to introduce foreign technologies. *(for more Fairs and Conferences, see the Appendices at the end of this report.)*

5 Sector Breakdown by Industry; Water, Air, And Land

5.1 Wastewater and drinking water

5.1.1 Market overview

At present, China is encountering severe water shortages, resulting from both a large population and water pollution caused by rapid economic development with little regard for environmental impact. Although the country has significantly improved its water and wastewater infrastructure, 400 of the 600 metropolitan area suffer from water shortages. Accelerated urbanisation and high-speed economic growth in China continue to aggravate the water shortage problem.

The water and wastewater treatment industry was a public good in China's past, with only limited fees paid for consumption of the resources. This system led to huge amounts of water being squandered and polluted, as well as to a scarcity of capital in the construction, renovation, operation, and maintenance of water and wastewater infrastructures or facilities. Fortunately, the Chinese government realised the need to value water as a resource and introduced market mechanisms in the water supply and wastewater treatment sector. China revised its main legislation, the Water Resource Law, in 2002. Water tariff and wastewater treatment fees are rising to rational levels, and public water infrastructure was opened to foreign and non-state-owned capital financing. China's water market is quite brisk, and China's WTO accession significantly affected water market reforms.

The World Bank has established a very strong partnership with the Chinese government in water resource conservation, and has supported China with an extensive portfolio of projects, analytical and advisory services, and technical assistance. The total World Bank investment in urban wastewater treatment in China is expected to top USD 10bn by 2012.

5.1.2 Market end-user analysis

The wastewater and drinking water treatment market in China has many different end-users, including municipal wastewater treatment, industrial wastewater treatment, and smaller treatment units for hotels/hospitals and new housing additions. Increased enforcement of current environmental standards forced many companies to begin investing in wastewater treatment technology.

At this stage, due to financial problems of enterprises, the government still bears most of the burden for wastewater treatment costs. This renders municipal wastewater projects financially unfeasible for most foreign and domestic firms. The government is however making other funds available. It has been estimated that 60 percent of the government 's spending on the environment, and a large part of private spending, will be on wastewater treatment offering tremendous opportunities for foreign companies.

While financing is mentioned as a major factor in entering the market and winning contracts, creative approaches are also important; this includes pilot projects, demonstrations, training courses, and/ or alignment with a research institute. Equally important is identifying end-users. The current water situation has prompted many new housing additions and five-star hotels to purchase their own water treatment facilities offering opportunities for small or medium sized firms.

Industrial wastewater treatment in China is the fastest growing sector of the wastewater treatment market. The industries to focus on are pulp and paper mills, dye and paint factories, chemical factories and food processing, and breweries. Many companies are looking for pollutant specific technology.

5.1.3 Market opportunities

China's water market reforms have created many opportunities for foreign enterprises. Significant amounts of new water infrastructures are to be built, and the operation and maintenance of all existing and newly built municipal water and wastewater treatment plants have been or will be transferred to authorised enterprises. Many forms of private and public partnership are now accepted by the Chinese government for supplying technology and equipment and for providing long-term investment opportunities for foreign enterprises.

The following technology needs offer the most opportunity:

- Biological denitrification and phosphorus removal technologies
- Membrane separation and manufacturing technologies and equipment
- Manufacturing technology of anaerobic biological reactors
- High-concentration organic wastewater treatment technology and equipment
- Series-standard water and wastewater treatment equipment with high efficiency
- Water-saving technologies and equipment
- Water treatment agents
- Monitoring instruments
- Natural water-body rehabilitation technology

A large number of water supply and wastewater treatment projects will be implemented in China to strengthen the existing water infrastructures.

From now until 2010 China needs to spend over USD 20bn to increase its capability to provide drinking water by 20 percent. In addition, China must extend and renew the existing water supply and wastewater collection piping systems.

Water Supply and Wastewater Treatment Technology and Equipment

The construction of new water and wastewater treatment plants and piping systems, as well as the reconstruction of outdated water and wastewater treatment plants and piping systems, creates a large market demand for relevant technology and equipment.

Water and Wastewater Treatment Technology and Equipment

High-efficiency treatment technologies are needed in both the water supply and wastewater treatment sectors. In the water treatment sector, pollution of surface water and groundwater creates demand for deep treatment technologies. In the municipal wastewater treatment sector, nitrogen and phosphate removal technologies are needed. In the industrial wastewater treatment sector, technologies that can efficiently remove non-biodegradable organics are needed in various sectors, including the pulp and paper, textile, chemical, and petrochemical industries.

The following specific technologies and equipment represent the best market potential in China:

- Municipal wastewater treatment
- Standardised water and wastewater treatment equipment
- Biological denitrification and phosphorus removal technology with high-efficiency and energy-saving technologies
- Manufacturing technology of anaerobic biological reactors such as upward-flow anaerobic sludge bed reactors, anaerobic filters, anaerobic attached-film expanded beds, and anaerobic fluidised bed reactors
- Immobilized microbe technology
- Membrane manufacture technology
- Low-speed and variable-speed multi-pole centrifugal blower
- Sludge treatment and disposal equipment Packaged thickening and dewater belt presses Horizontal screw centrifugal dewatering Methane electric generators
- Automatic control equipment for water treatment

- Industry wastewater treatment
- High-concentration organic wastewater treatment technology and equipment
- Membrane separation technologies, such as reverse osmosis, nano-filtration, ultra-filtration, micro-filtration, and ion exchange
- Wastewater deep treatment and reuse technology and equipment in industry sectors, such as surface treatment, coal and mining, pulp and paper, metallurgy, petroleum

New municipal wastewater treatment plants are rapidly being constructed in China's cities. The South-to-North Water Diversion Project, the Three Gorges Project, the comprehensive pollution control and ecological rehabilitation project in the Three-Rivers and Three-Lakes regions, and the National Western Development Project will account for an anticipated total investment of approximately USD 22bn in water supply and wastewater treatment facilities before 2013. Besides key state projects, there are several water and wastewater treatment projects in special economic regions, such as the Beijing-Tianjin-Tangshan Economic Delta, the Shanghai Yangtze River Economic Delta, and the Pearl River Economic Delta.

China intends to greatly expand its sewage treatment rate in large cities for which a great deal of hi-tech equipment is needed. Equipment with the best sales prospects for foreign companies includes, but is not limited to:

- Flow meters/hydraulic pressure gauges
- Water quality monitoring systems
- Large pumps
- Disinfecting equipment
- Reverse-osmosis water treatment systems
- Physical and chemicals analysers or monitors
- Valves
- Screening presses
- Digester agitators
- Aerating brushes for oxidation ditches
- Shaft-less screw conveyers

- Methane generators and meters
- Adjustable outlet wires
- Sludge scrapers
- Suction devices and aerators
- Computerised monitoring systems

Industrial specific treatment methods are also needed in the following industries:

- Paper mills
- Dye factories
- Food processing plants
- Pharmaceutical
- Chemical
- Fertiliser

Supervision and management related projects also offer good opportunities for the consulting sector specialised in water management.

The following table shows proposed spending on municipal wastewater plants.

Year	Budget (USD bn)	5.1.3.1.1 Number of Plants	Capacity (mn^3/day)
2001–2008	1.17	78	3.785
2009–2013	0.77	57	2.905
Total	**1.94**	**135**	**6.690**

Table 2.7.3.1 Construction Plan for Municipal Wastewater Treatment Plants: Source; PRC, State Environmental Protection Administration, 'The Progress on the Wastewater Treatment on the Eastern Route of the South to North Water Diversion Project'

5.2 Air pollution

5.2.1 Market overview

Overall pollution levels are still high and SO_2 and NO_2 are major pollutants. Some cities have high concentrations of them making some regions heavily polluted. Ambient concentrations of suspended particles are extremely high in most cities, and sulphur dioxide concentrations and acid rain are also high in areas where high-sulphur coal is consumed. The scope and frequency of acid rain remains out of control. Acid rain still affects up to 30 percent of the country. In general, northern cities have more serious particle pollution because coal is used for space heating, while southern cities have serious sulphur dioxide pollution due to regional coal with higher sulphur contents. In addition, carbon emissions and related greenhouse problems are also major air pollution sources.

Air pollution resulting from coal-fired furnaces, industrial exhaust gases, and, in particular, auto emissions continues to be a major problem. Steps have been and are being taken to reduce air pollution through cleaner production programs, the introduction of emission controls, and the conversion in some cities of taxies and buses to cleaner fuels. Thus, carbon emissions also provide opportunities for foreign companies.

Urban air

China's major cities have some of the highest levels of air pollution in the world, often with pollutant concentrations at multiples of the levels considered safe for human health. The Chinese government has undertaken a series of actions to address the problem including:

- enacting a series of laws, regulations and standards
- the establishment of governmental organisations responsible for environmental protection
- environmental monitoring
- energy conservation and investment in environmental infrastructure
- installing pollution control devices
- utilising cleaner production technologies
- installing natural gas infrastructure for cooking.

Despite these measures, concentrations of pollutants such as reparable particulate and sulphur dioxide continue to exceed ambient standards in most major cities, and concentrations of pollutants such as oxides of nitrogen and ozone are increasing.

Vehicle emissions

China has placed great emphasis on the development of the vehicle industry and the number of vehicles is expected to rise from 12 million in 1997 to 49 million by 2010, leading to a substantial rise in air pollution. Discharge levels of many domestic vehicles are five to ten times higher than in developed countries, largely due to the use of outdated technology.

In an effort to cut down on auto emissions, the Chinese government has issued stringent regulations and emphasised enforcement. As of January 1, 2000 all automobiles had to be equipped with an electronic fuel-injection system and auto emissions control equipment creating market opportunities in the vehicle emission area.

Acid rain

Coal burning accounts for more than 90 percent of China's sulphur dioxide emissions, and is a major cause of acid rain. Central, South, Southwest, and East China experience serious acid rain impact with no substantial improvement in recent years. State authorities are encouraging many thermal power stations and large factories to install desulphurisation equipment when burning high-sulphur coal. Some cities are replacing coal with cleaner energy, such as electricity or natural gas, in central heating systems and for daily use.

In 1998, the Acid Rain Control Zone and a Sulphur Dioxide (SO_2) Control Zone were created. New construction projects in these zones must use low-sulphur coal, or be equipped with desulphurisation and particle control equipment. Existing industries must switch to low-sulphur coal and adopt other measures to reduce emissions of particulate and SO_2 discharges. The deadline for compliance is 2010.

There is still a severe shortage of advanced, practical control technologies. Under the 11th Five-year plan-updated with the tightening of some emission limits, the introduction of total emission control, and the designation of special control zones (covering 39 percent of the population) [not sure what he means here-MS]. The rate of emission charges was trebled. Desulphurisation technology is still confined to the experimental and demonstration stages, not yet available for large-scaled practical use. The technology for treating polluting gases produced by medium-sized and small industrial furnaces and kilns still needs to be improved.

There is a huge demand for financial input for industrial renovation due to the large, long-term debts incurred. Estimated pollution treatment costs for China's old industrial enterprises are at least CNY 200bn, and most industries are unable to meet this additional cost. These enterprises must take measures such as technical

innovations, cleaner production processes, reform of industrial structures and distribution to control pollution;

Large and medium-sized cities are to establish timetables for food service establishments to convert from coal to natural gas, liquefied petroleum gas (LPG) or electricity and for household cooking stoves to convert either to clean fuel--i.e. gas or electric-- or to coal briquettes. Construction sites and other sources of airborne dust must adopt dust-control measures stipulated by local environmental authorities. Cities are urged to expand per-capita green space, pave over barren areas, and control road dust. SEPA will conduct comprehensive audits of these local dust-control measures.

Key issues include:

- Energy efficiency improvement.

  Policies promote industrial modernisation; cleaner and more efficient production technologies and processes, economies of scale, and better enterprise management; high-efficiency industrial equipment such as boilers, electric motors, fans and pumps; and industrial energy conservation such as plant or equipment renovation, energy housekeeping, and demand-side management.

- Cleaner coal and energy diversification.

  Policies encourage coal washing, gaseous fuels for residential and commercial use, and research and development in low, or zero-emission energy sources and technologies. In the short to medium term, increasing use of imported gas and oil could reduce demand for coal and overall emissions.

- Emission control.

  Emission would fall if high-efficiency dust precipitators were installed in industrial boilers and furnaces, high-efficiency electrostatic precipitators were installed in power plants and large point sources, and sulphur dioxide emissions were controlled in areas burning high-sulphur coal.

The government is developing market-based policies to shift incentives, institutional reforms, and regulatory changes. In addition, changing the energy pricing system, implementing air standards and other regulations, releasing environmental reports and improving public awareness are also important. At the end of the day though, enforcement remains an issue with some plants going so far as to install desulphurisation equipment, but then fail to use it.

5.2.2 Market and sales prospects

Industry

China is the world's biggest producer and consumer of coal. Only 22 percent of coal undergoes dressing and cleaning. Coal for energy use is predominantly raw coal. The prospects for briquette and coal washing technologies are large. Local coal washing products do not meet the technological standards and demand in this sector. At the same time, China plans to significantly lower its sulphur discharge by equipping coal burning power plants with flue gas desulphurisation equipment.

The chemical sector is the biggest polluter, but the metallurgical industry, power plants, paper mills, cement plants, and the leather and textile industry contribute significantly as well. China needs electrostatic precipitators consisting of dry, plate, and horizontal type equipment, as well as fabric filters, and cyclone particulate collectors for its particulate removal market.

Vehicle emissions

China has recently taken major steps to improve vehicle emissions control. This has created a huge demand for catalytic converters, electronic fuel injection systems, fuel evaporation control systems, retrofit technologies, and emission detecting instruments. The Chinese government is also advocating conversion from coal or gasoline/diesel fuelled engines to natural gas.

Monitoring stations

China has over 4,000 environmental monitoring stations but much of the equipment used is outdated and in poor condition. Newly built monitoring stations are required to have new and advanced equipment. Some higher quality equipment with more advanced technology needs to be imported, including satellite remote sensing monitoring systems.

5.3 Ground pollution

5.3.1 General situation

China's ground waste is enormous, not only in quantity but also in variety causing serious pollution. According to the data from SEPA, in 2004 the total amount of generation of industrial solid waste was 1.2bn tons. The total amount of discharged industrial solid waste was 17.92m tons, while hazardous waste reached 9.63m tons. In 2006, the generation of industrial solid waste increases to 1.51bn tons, industrial solid waste discarded increased to 13.0bn tons, and hazardous waste reached 10.8m tons.

Solid waste refers to all kinds of solid, semi-solid and highly concentrated liquid waste generated from production, consumption, living and other activities, such as hazardous industrial waste, radioactive waste, municipal solid waste and used materials. Annually, a large quantity of solid waste is generated in China. For industrial solid waste, the stack-up volume over the years has exceeded 6bn tons, with a comprehensive utilisation rate of only 40 percent and a relatively low disposal rate. Most of the industrial solid waste is simply piled up, causing serious pollution in surface and ground water. Obviously, management of hazardous waste and radioactive waste is the most important component to reform

Demand for solid waste treatment is rising and a lack of regulatory enforcement has retarded development of local solid waste industry and quality is low. For this reason supply from local players cannot match demand and end users increasingly import advanced treatment technologies and equipment. One problem however is the prohibitively expensive cost of these technologies and equipment, as small-scaled enterprises cannot afford it. It is expected that the market for solid and hazardous waste treatment equipment, services, and technologies will grow as enforcement efforts are stepped up.

5.3.2 End user analysis

Usually, the end-users are municipal governments, state-owned enterprises, quasi-private enterprises (which are formerly state-owned enterprises that are now organised on a corporate model, with private and public shareholders) and foreign invested enterprises. These enterprises are required to comply with discharge limits imposed by central and local government regulations. Most enterprises have an urgent need for more sophisticated equipment but lack financial resources to procure it. Therefore, the majority of opportunities typically surround multinationals, multilateral bank projects or projects seeking foreign investment.

Other end-users include large multinational manufacturing facilities, large international hotels in major cities, or private sector recycling operations.

5.3.3 Market prospects

Due to the urgent nature of the hazardous waste sector technology and equipment transfers from foreign countries, scientific research and construction of demonstration projects for disposal of hazardous waste are in high demand:

China is currently attempting to establish demonstration projects in the following areas:

- Electroplating waste minimisation
- Chromic slag recycling
- Safe landfill and incineration of hazardous waste
- Recycling of plastic waste

The disposal of medical waste poses a serious problem in China, particularly people 'robbing' one-time-use medical waste at the dump and re-handling the waste into new 'medical product'. This is an area requiring specialised technology, which can only be foreign sourced. Foreign companies will find a ready market in this area.

There exists at present a huge market for paper and plastic recycling and a considerable amount of scrap plastic and paper is imported into China every year creating a huge potential market for foreign firms in terms of raw materials and recycling equipment.

Solid waste pollution in China is growing increasingly severe, and has been dealt with less comprehensively than water and air pollution. The government has only recently begun to encourage the development of the national solid waste treatment and local industry clearly lacks the experience and technology to satisfy the rapidly growing demand. As a result, the increasing demand for waste management technology cannot be met by local industry.

A number of local and municipal authorities plan to make significant purchases of technology and equipment during the next few years as the Solid Waste Management System is developed. Best prospects include the following products:

Urban waste collection and transfer vehicles

- Compressed refuse collectors
- Facilitated refuse dumpsters

- Mechanical transfer station of refuse, related equipment.
- Special urban vehicles with large capacities: garbage trucks, night-soil trucks, and highway cleaning trucks.

Auxiliary equipment and technology for landfills

- Landfill machinery: garbage compacting machinery such as landfill site slope compacting equipment
- Liner materials: the liner laying and welding
- Quality guarantee system: site-detecting system, monitoring system and instruments
- Anti-seepage material and waste water drainage systems and materials

Landfill treatment

Local landfills usually use clay as anti-leaching material. Chinese producers generally cannot provide anti-leach materials, landfill wastewater collection systems, methane gas collecting and recycling equipment, and new style landfill covering materials.

Waste sorting equipment

Local producers generally can provide cylinder screeners and permanent magnetic cylinder screeners used in compost sorting processes. Chinese firms generally cannot produce a large scale sorting system to select the recyclable wastes.

Gas-fired incinerating technologies

Drum incinerator for centralised industrial hazardous wastes treatment: features should include high pollutant removal rate, preventing secondary pollution, lost heat collection, automatic monitoring and control system.

Recycling and comprehensive utilisation

- Circulated / Pressured fluidised bed combustion furnace using coal refuse -- Metals recycling and utilisation equipment:
- Large sized waste steel recycling equipment such as 1,500-tonne-grade waste steel cutting machinery, large sized crushing appliance, 800-ton-grade three dimensional waste metal packaging machine, and related attached appliances
- Small sized waste metals compacting equipment and heavy metal waste liquid recycling equipment.

- Copper, aluminium, and lead recycling equipment, including equipment of waste metal crushing, screening, and casting

- Composting technology and related equipment: China needs large sized composting technology and simple composting equipment.

- Management services, monitoring equipment and software

Integrated solid waste management system and software to provide unified truck and site management for all Shanghai districts This may include discharge and emissions monitoring equipment for stations and sites.

Radioactive waste facilities and monitoring equipment

5.4 ISO14000 license

With China's entry to the WTO, the problem of 'green barriers ' has arisen more often. If Chinese products cannot reach international environmental standards they cannot access foreign markets. The international standards system for environmental protection – ISO14000 – is an important instrument for China. ISO14000 offers key solutions to environmental requirements as one of the leading non-tariff barriers in international trade, helping enterprises and organisations set up and improve environmental management systems including the economical use of energy. Chinese enterprises need ISO14000 certification, because it inevitably will benefit business.

Many foreign certification bodies are eager to enter the Chinese environmental market and compete with local players. With the market open and international competition, the environmental service industry will develop rapidly.

5.5 Entering the market

Considering the size of the country, the number of its inhabitants, and the scope of the environmental deterioration the market for environmental technology in China is virtually unlimited. The Chinese market, however, is still a difficult one. The fact that China is still a developing country should not be ignored. Major constraints often include lack of finances; price is still the primary concern for most buyers.

Foreign competition is fierce in this sector in China. As most projects are financed in local currency (RMB), foreign firms tend to target a small pool of prosperous Chinese cities with foreign exchange reserves and projects financed in foreign currencies by the World Bank and the Asian Development Bank.

In addition, a number of foreign governments have very aggressive concessionary financing and tied aid programs. Japanese and European companies have been particularly successful in leveraging their government aid programs to land contracts.

According to statistics developed by MEP [what 's this?-MS], more than 20,000 Chinese enterprises were actively involved in the environmental protection and pollution control sector in 2003. These enterprises are concentrated in coastal and riverside areas in China.

In short, the environmental industry has benefited from large-scale investments by the central government, Multilateral Bank and Foreign Government Aid programs. This has led to an increase in the number of local manufacturers and service providers who are hoping to cash in on the recent surge in environmental spending. The vast majority of local firms have targeted the air/emissions and wastewater sector. Local firms are very competitive in fabrication, civil engineering, and facility construction, but generally lack technology, systems integration, and over-all facility management expertise.

Key players on the vast environmental technology market in China are Great Britain, Germany, France, and the United States. Finland is active in the air pollution control market. Apart from Japan, aggressively promoting environmental business in China, there are few regional players. Korea and Malaysia have only recently been discovering the Chinese environmental market. They have the price tag advantage, but seldom offer the best technology. US players are actively pursuing alternative energy development and energy efficiency improvements in China.

Many foreign companies also cite illegal copying of advanced technologies as a major hurdle to doing business in China.

5.5.1 Market access

Price and financing are usually the determining factors for procurement decisions by private firms and municipal government organisations alike.

The most important counterpart for foreign companies selling environmental technology is still the government. As a result, keeping the good relationship with government bodies is the shortcut for getting a chance. Also, updated information on Chinese environmental policies, regulations, and markets should be required for this [what?-MS].

The Chinese environmental market is not monopolistic. Great diversity exists in different regions in terms of possibilities, specific needs, and ways or mentality of doing business. Adequate knowledge of the Chinese business culture and customs must be obtained in order to operate successfully in the different segments of this vast market. Patience and informal contacts are essential for success.

There are also several ways to enter the Chinese market in the field of environmental technology. Setting up a representative office may be the best way for foreign companies to enter China. Alternatively, for companies new to the market, finding capable agents or distributors is a good way to enter the market. Another possibility is establishing a Chinese partnership/joint venture. Foreign investors are increasingly encouraged by the Chinese government to establish joint ventures, or even wholly foreign owned projects, in the environmental sector.

The best route may be to team up with a government-linked firm, since the government currently accounts for a large proportion of environmental investment. Joint ventures often help determine and develop suitable technology and equipment, and at the same time reduce production cost.

5.6 Competition

According to statistics developed by MEP, more than 20,000 Chinese enterprises were actively involved in the environmental protection and pollution control sector in 2003. These enterprises are concentrated in coastal and riverside areas in China.

Foreign competition is also fierce in this sector in China. As most projects are financed in local currency (RMB), foreign firms tend to target a small pool of prosperous Chinese cities with foreign exchange reserves and projects financed in foreign currencies by the World Bank and the ADB.

Competition for water and wastewater infrastructure projects in China is fierce. China's domestic technology, equipment, and service sectors do not compare favourably to imported products; however, they do compete favourably with low prices, easy access to domestic markets, and continuous improvements in quality. Foreign enterprises from France, Germany, and the United Kingdom gained a comparatively strong market share in China's water market. The long investment history of successful foreign enterprises in China helped these enterprises build solid relationships with the Chinese government and sound reputations for providing technology and services. These foreign enterprises also gained a good understanding of China's market status and its associated business risks.

In addition, a number of foreign governments have very aggressive concessionary financing and tied aid programs. Some Japanese and European companies have been particularly successful in leveraging their government aid programs to land contracts.

In short, the environmental industry has benefited from large-scale investments by the central government, multilateral banks, and foreign government aid programs. This has led to an increase in the number of local manufacturers and service providers who are hoping to cash in on the recent surge in environmental spending. The vast majority of local firms have targeted the air/emissions and wastewater sector. Local firms are very competitive in the fabrication, civil engineering, and construction of facilities, but generally lack technology, systems integration, and overall facility management expertise.

5.7 Financing

Since China is still a developing country, hard currency for investment in environmental technology is not easily available. In most cases, the end-users of environmental equipment will be public authorities (an estimated 50 percent) or state-owned enterprises (around 15 percent). Provincial and municipal governments are dedicating more and more money from their budgets to environmental investment. Therefore, close contact should be maintained with provincial and municipal planning commissions and financial departments, as well as with local environmental protection bureaus for information regarding regulations, projects and financing. At present, projects backed by multilateral funding (about 30 percent) are subject to international competitive bidding. These projects generally have adequate hard currency backing, which greatly simplifies project finance.

In addition to government and international funding, opportunities are sometimes presented by private industrial enterprises, large office buildings, hotels or hospitals and residential areas. As far as bigger projects are concerned, the concept of cluster-finance may offer a possibility. Under this concept, various forms of financing--multilateral loans, such as World Bank, bilateral subsidies or grants, commercial loans and Chinese contributions-- may be combined to cover the total cost of the project.

With a growing awareness that polluters and consumers should pay a realistic fee for the services of clean-up activities, the possibilities for these types of projects may increase. The Chinese government especially hopes that foreign companies will invest in BOT and BOO schemes in its water infrastructure, including advanced water treatment technology and new management structures. It will, however, only consider BOT schemes for big projects. Smaller joint ventures may be an alternative, but only as long as foreign companies are willing and able to bear a substantial burden of this form of cooperation.

Joint venture projects may be eligible for tariff exemption or reduction on the importation of capital equipment because investment in the environmental protection area is a preferred category of foreign investment. Equipment to be acquired through foreign investment must be approved by local government authorities in the course of preparing the feasibility report and obtaining contract approval.

5.8 Tariffs

China plans to reduce tariffs on environmental protection equipment and products from the current average rate of 13.4 percent to 6.9 percent by January 1, 2008. China reduced 70 percent of line item tariff rates to 8.85 percent in 2003, and further reduced 98 percent of line item tariffs rate to 7.03 percent in 2005.

5.9 Tendering

Tendering is required for major projects funded through international funding entities. Such business opportunities may be located through the China Daily newspaper, China Tendering magazine or at www.chinatendering.com.cn and www.chinatender.gov.cn

5.10 Quality certification

Foreign equipment exporters should consider obtaining a voluntary quality certification. MEP issued Measures for Management of Environmental Protection Product Certification, which became effective January 1, 2002 (hereafter referred to as Certification Measures). The Certification Measures purport to promote technological progress of the local environmental protection industry, promote development of environmental technology trade, and implement environmental protection product certification work.

Environmental protection products subject to these measures include equipment, environmental monitoring apparatus, biological agents, and materials used for control of pollution, improvement of the ecological environment and protection of natural resources. All products governed by the Certification Measures, the manufactures or their sales agents (domestic and foreign) may apply for product certification. The certificate is valid for three years and may be extended upon request and re-examination.

Conclusions

There has been a general increase in water projects creating a large, diverse and growing market for water treatment technologies, including municipal water treatment facilities for drinking water, as well as drinking water treatment equipment for the bottled water and home treatment sectors.

The government 's inability to invest and to fill the huge capital demand creates opportunities to involve non-state-owned or foreign investment. The Chinese government is encouraging non-state-owned and foreign investment participation. These policies include preferential tax policies for the industries and projects listed in the Foreign Investment Industry Guideline. Guided by the state 's policies, local governments established relevant policies applicable to local areas. Companies can obtain details on these policies from the local governments and taxation bureaus.

Forming a private and public partnership (PPP) is a common method for non-state-owned and foreign participants in the water supply and wastewater treatment sector. For specific projects, build operate-transfer (BOT), and design-build-operate (DBO) schemes are often used. Because the concept of PPP is a new one in China, the Chinese government has not set specific regulations or guidelines regarding schemes. Foreign companies and investors are likely to encounter a dilemma in assessing the opportunities and challenges for participation and the accompanying financial risks.

Clean fuels, desulphurisation, coal washing, air quality monitoring, and other related technologies for prevention and control of air pollution are also required.

As for the solid waste treatment sector, advanced equipment and technology are always welcome, especially for the treatment of hazardous solid waste and medical solid waste.

Whilst research centres have been created advanced environmental technology for hazardous solid waste treatment is still essentially in the research stage and is only recently being put into practice. This means there is a large-scale environmental market in China offering a wide range of market opportunities for foreign companies.

6 Appendix

6.1 Environmental projects

Area	Projects
Hebei Province	**Hebei Cangzhou Qingxian South Korean Industrial Base Sewage Treatment Plant Project** Investment: CNY 153 million Area of this project is 404, 685 square meters. Recent project construction scale is 20,000 tons/day, further project is 45,000 tons/day. Sewage treatment technology is 'cast'. Contact: Li Guoqing TEL: +86(317)407 8600
	Sewage Treatment Project in Dongguang County Investment: CNY 128.36 Million Area of this project is 242, 811 square meters. It will be designed as sewage treatment ability of 60,000 tons a day, annual ability is 21.9m cubic meters. Contact: Ma Fucheng TEL:+86(317)772 1726
	Cangzhou Lingang Chemical Industrial Park 50,000 tons Sewage Treatment Project Investment: CNY 122,320,000 This project is mainly about treatment of urban water consumption and enterprise waste water. Contact: Tang Jinlin TEL:+86(317)548 8543

Area	Projects
	Cangzhou Lingang Chemical Industrial Park 23.3000 tons/year of Industrial Wastes Incineration and wastes landfill project Investment : CNY 89,730,000 This project is about urban wastes and industrial wastes of Cangzhou City. Treatment fee for one ton is USD 93.With the higher environmental criteria, more wastes will have to be treated which will make more profit. Contact: Tang Jinlin TEL: +86(317)548 8543
	Sewage Treatment project in the West Handan city Investment: CNY 117.633 million This project deals with waste water of Handan City. Service area is 215,400 square meters, and covering 450,000 people. Contact: Zhang Xinjun, Wei Hong TEL: +86(310)302 6427, 312 2819
	Wanlidawa Sewage Treatment Plant of 40,000 tons In Cang County Water is strategic economic resource, and with more and more pollution, we need more sewage treatment plants to clear the polluted water. Contact: Sun Hongxiang TEL:+86 (317)305 3116

Area	Projects
	Cogeneration of Straw Renewable Resources in Botou City Botou Thermoelectric Co., Ltd is planning to build a 2*12mw straw renewable resources cogeneration project. The area is 485,622 square meters, annual generated energy is 132 million degrees, annual heat loading is 963,200gj, and annual straw consumption is 240 thousand tons. Contact: Xing Weimin TEL: +86(317)556 1970/818 4541
	Sewage Treatment Plant and Urban Pipe Net Reconstruction in Qinglong Manchu Autonomous County of Qinhuangdao City Investment: CNY 49,030,000 It is being planned to build a sewage treatment plant of 21,000 tons and reconstruct urban pipe network in county.
	Advanced Degradation of Meal Boxes in Luan County, Tangshan, Hebei With the development of the third industry, the number of meal boxes is growing fast; with the strengthened ideas of environmental protection, degradation of meal boxes is in the direction of future development. Two reasons for choosing this place: 1. Convenient traffic, well-developed communication, rich water and power resources. 2. Rich materials.
	Wastes Treatment Project in Zunhua City Investment: CNY 22,490,000 Annual garbage produce is 100,000 tons in Zunhua, consistent with the growth in population. Garbage land fills are full, and garbage elimination is the main obstacle of economic development. This project contains waste storage warehouses workshops, distributed processing workshops, biological transformation workshops, mill workshops, and fertiliser workshops. TEL: +86(315)282 1720

Area	Projects
	Sewage Treatment Plant in Zunhua City The capacity of this sewage treatment plant is 80,000cm a day. At present, Zunhua city lacks good drain systems, as all of domestic and industrial sewage is piped to Shao River, Qingshui River, Laozhua River and the city moat, which in turn pollutes water in the rivers. So sewage treatment plants are needed. TEL: +86(315)282 1720
Shanxi Province	**Completely-closed Intelligent Handling of Used Batteries in Yangquan, Shanxi** Investment: CNY100 million Used batteries are the main pollutants of the world environment. Recently, production of batteries has grown fast, and statistics show that 11bn batteries are used each year and this figure is growing. So we need factories for handling these batteries. Contact: Liu Lindi TEL: +86 (353) 806 0777/662 6777
	Sewage Treatment Project in Niangziguan Contact: Wei Delin, Zhang Aibao TEL: +86 (353)603 272 20353—603 1156
	Sewage Treatment Plant in Pingding County Sewage recycling project relies on water quality. It is in charge of Pingding County Sewage Plant. Planned scale of project is 21,600 m3/d, and it needs an investment of CNY 18.1m.

Area	Projects
	Urban Living Wastes Landfill Project in Yu County It aims at getting rid of 220 tons a day of garbage.
	Sewage Treatment Plant in Yinying Town, Yangquan city This project is being planned to use BIOLAK technology of a German company (Von Nordenskjold Verfahrenstechnik GmbH). It is popular with a lot of sewage treatment plants Contact: Bai Chaohui TEL: +86(353)505 3325
	Comprehensive Ecological Environmental Development in Longhai Moutain The main peak (Jade Emperor Mountain) of the Longhai Mountain is over a thousand meters tall. It is the source of Yijing River, faces the monument of 'Great Battle of Hundreds of Regiments' and Shinaoshan Forest Park. The project contains: 1.Botanical garden. 2. Breeding park. 3. Pond fish culture. 4. Sightseeing, holiday project. 5. Road 6. Ancient temples reconstruction. 7. Water, power, and heating Contact: Wang Chunhai TEL: +86 133 035 373 73
	Sewage Reutilization Project in Datong Development Zone Expected investment ways include joint venture, wholly-owned or a shareholding system. Contact: Wu Deyuan, Zhang Zhongcheng TEL: +86 139 352 938 28, 130 080 801 33

Area	Projects
	Living Wastes Treatment Project in Datong The expected investment ways are joint venture, wholly-owned, shareholding or cooperation. Datong daily waste is a thousand tons, feces 600 tons. This project will give a lot of benefits to Datong. Contact: Xu Yuefeng TEL: +86(352)201 6280
Jilin Province	**Sewage Treatment Project in Baicheng City** Beicheng city has a total of 41,160 m3/d of sewage, total mileage of sewage pipes equal 61.8 km. The sewage exit is located in southeast of city. The sewage is piped through a pumping house to Mingqu and Dacaodian. The project aims at a sewage treatment plant of a capacity of 50,000 tons/d, 6 pumping houses, a 46 km sewage pipeline, reconstruction of old 3 pumping houses and some additional pipelines. Uses oxidation ditch processes Contact: Guo Shuping, Li Chuang TEL: +86(436)324 7732
	The 5th Water Purification Plant in Changchun Changchun is the capital city of Jilin Province. It is a fast-developing city which requires a large amount of water, so purification of underground water and water resource are listed as goals of water resource construction of Changchun. The 5th water purification plant will be important to the industrial and living water supply and it will play a big role for 'the eleventh five-year plan' in Changchun. Contact: Li Shiyong, Sun Jiansheng TEL: +86(431)590 6068, +86(431)590 6058

Area	Projects
	East Sewage Treatment Plant in Changchun East sewage treatment plant mainly deals with industrial and living sewage in Economic-Technological Development Area and Jingyue Development Zone. It clears Yitong River which is beneficial to the scenery as well as clearing river water that can be used for garden watering, car washing, cooking, and city construction.
	Project of High Energy Environmental Protection Blake Pads in Changchun Guangda Frication Production Co., Ltd was listed as a project of the national key new product. Its main product is 'brake pads' made by carbon fibre composites for cars. Contact: Wang Chao, Zheng Shuju TEL: +86(431)852 0138
	Southern Sewage Treatment Plant in Changchun This plant will be located in high-tech development zone. It has an area of 80,000 square meters. It contains a sewage treatment plant with the treatment ability of 150,000 tons a day.
	Living Wastes Treatment Project in Changchun The purpose of this project is to enhance the treatment level of living wastes and the environment as well as to solve the contradiction between the fast growth of living wastes and antiquated environmental protection equipment. This project has been approved by relevant authorities and experts. It will use well-developed landfill methods. This method has the advantages of low cost, mature technology and easy management. It has sustainable development potential.
	Sewage Treatment Plant of Western Xinkai River, Changchun This project is to build a sewage treatment system, pre-treatment system, biological sewage treatment system, sludge treatment system and commensurate equipment. The plant will treat 100,000 tons a day, with 70,000 tons to be reused. Contact: Cheng Shuchun TEL: +86(431)590 2277

Area	Projects
	Garbage Incineration Power Station Engineering Jilin city has daily garbage weighing 700-1,000 tons which led to the establishment of a garbage incineration power station. The municipal government has decided to build garbage incineration power station which contains two sets of 400 ton garbage burning boilers and two 6,000 KW condensation turbo-generators. Contact: Qiu Jixiang TEL: +86(432)204 9412
	Sewage Treatment Project of Sewage Treatment Company in Jilin city Jilin city is located upstream of the Songhua River, and is its main pollution source .With the development of the city, more and more polluted water is piped to the Songhua River bringing harmful, polluting bacteria. In order to get rid of pollution, and protect the health of the river, Jilin is going to set up a sewage treatment plant. Contact: Qiu Jixiang TEL: +86(432)204 9412
	Urban Sewage Treatment Project in Meihekou City This project is to protect drinkable water resources and the water quality of the downstream regions of the Huifa River. It is necessary to replace antiquated urban sewage equipment and the urban tension water supply. Its plan is to build a sewage treatment plant with the capacity of 6,000 tons a day as well as reuse 3,000 tons a day. Contact: Zhang Yongping TEL: +86(4410) 422 2270

Area	Projects
	Environmental Protection Catering Units Project in Changling County This project uses the skin of sunflower seeds to make disposable catering tools to completely stop 'white pollution'. Changling county is abundant in sunflowers. This project will be good for the environment and it also has a huge potential market. Contact: Lian Weiyi , Gai Changqing TEL: +86(438)722 3393
	Urban Sewage Treatment Project in Jiaohe city Jiaohe city is located upstream of the Songhua River. With the development of the economy, pollution has grown. It is estimated that the quantity of pollution will reach 30,000 tons a year in 2010. In order to preserve the biological environment and reduce pollution in Songhua River, a sewage treatment plant will be established with a total scale of 60,000 tons of daily treatment. Of this, the treatment ability of the 1st phase is 30,000 tons/day. A sewage interception pipe will be 3,400 meters long, a sewage pipeline 1,800 meters long, and a reconstructed pipeline 9,800 meters long Contact: Qu Jie TEL: +86(432)726 7005 +86(432)726 7006
	Water Treatment Project of Southern, Northern River in Siping City Contact: Qi Decai Phone number: +86(434)508 1915
	Sewage Treatment Project in Tonghua City Contact: Ren Hongfei TEL: +86(435)361 8391

Area	Projects
	Green Large Seedlings Exchange Market and Biological Leisure Center 485,622 square meters-large seedlings exchange area 404,685 square meters-large leisure centre Contact: Guo Fanjin TEL: +86 139 513 881 48
	Environmental Protection, New Energy Production Investment options: Wholly-owned, joint venture, cooperation Products of environmental protection and new energy are the trend of resource development, rendering this a potential market.
Jiangsu Province	**Urban Sewage Treatment Project: Phase Ⅱ** Phase I is for improving sewage treatment ability to meet popular need. Its main project items are a sewage collection net (of between 400—1400metres long, long 9.98 km; 2 lifting pump stations, total scale is 48,000 m3/day.
	Water Treatment Plant Project Guangfeng County is a strong economic county in Jiangxi Province with a population of 770,000. Guangfeng city has a population of 150,000 and an area of 15 square km. It is a 'National Hygiene City' and 'Civilized City of Jiangxi Province'. Sewages are mainly for domestic sewage and industrial sewage. Sewage treatment plants are connected to construction and sustainable development of a city. At present, sewage threatens the environment. Because at present Guangfeng County lacks a sewage treatment plant, construction of one will produce huge economic and social benefits. Contact: Shen Jiayi TEL: +86 (10)883 590 82 transfer 103, +86 136 911 61556

Area	Projects
	Taishan Seedlings and Flower Technology Pilot Park Project The project covers an area close to Panhe Street, linked to the Jing-Hu and Jing-Fu expressways in the east, and to State Highway 104. This project is a provincial level agricultural pilot park approved by Shandong Provincial Science Department and Financial Department. Planned area: 700 hectares, core area: 200 hectares. The park is designed with three areas of different functions: Germplasm resources district, Factory seedling district and Exhibit and Sales District. So far, the park has attracted 200 greening, fruit tree, flower and Chinese medicines of high quality from home and abroad, with 20 qualified seedlings produced annually. Eight science institutions moved into the base, and developed many a types with independent intellectual property rights. Taishan Flower Exhibition Centre phase one and phase two has been completed. The Park has held several International Flower and Seedling Exhibition. Contact: Mr. Liu/ Mr. Sun TEL: +86 (538) 699 0963/699 1091
Jiangxi Province	**Dawenkou Cultural Heritage Tourism Resource Development Project** Joint-venture, partnership, exclusive investment This project aims to protect Dawenkou Cultural Heritage, as well as rebuild and conserve surrounding places of historic interest, and support infrastructure and facilities such as roads , hotels and restaurants for tourism. Contact: Mr. Liu/ Mr. Sun TEL: +86 (538) 699 0963/699 1091
Shandong Province	**Jiaozuo Municipal Construction Investment and Development Co., Ltd. Medical Waste Disposal Centre Project** Contact: Wang Xiaojun TEL: +86 (391) 358 5840

Area	Projects
	Residential Garbage Treatment Project for Wuzhi County Wuzhi County Municipal Construction Investment and Development Co., Ltd, established in March, 2004, is a wholly state-owned company with registered capital of CNY112, 680, 000. Investment return circle: 12 years. Contact: Feng Wei TEL: +86 (391)7289799, +86 138 391 231 11
Henan Province	**Hengde Environment Protection Industry Park Seeks Cooperation Project** Hubei Province Xiantao Municipal Investment Promotion Bureau Contact: +86 (728) 331 2265, +86 139 979 945 01
	Chaoyang District Water Treatment Plant Project Phase One This project covers 11 hectares. The initial investment is CNY 255, 000, 000 to set up a Water Treatment Plant with daily capacity of 75,000 tons, and pipeline of 14.5 km and a midway pump station. Capacity of the pump station is 75, 000 tons/day in dry days and 15,000 tons/day in rainy days. After completion, this Plant is to serve Chaoyang district. Water level after treatment is State level 1. Investment return period: 20 years. Contact: Zhang Guangxing TEL: +86 135 468 823 93, +86 (754)383 5714

Area	Projects
Hubei Province	**Chaonan District Liangying Waste Water Treatment Plant Phase 1** Joint investment, exclusive investment Liangying Waste Water Treatment Plant covers an area of 60 mu. Designed capacity for its first phase is 30,000 tons per day with supporting pipeline of 19.68 km long. The designated investment is 88 million CNY.. Investment return will be from waste water treatment fee. Investment return period: 17 years. Location of the Plant: Liangying Town, Chaonan District, Shantou Contact: Zhou Ruolin TEL: +86 138 228 575 66, +86 (754)557 1729
Guangdong Province	**Puding County Water Treatment Plant** Puding county now has a population of over 40,000 people. The daily waste water released equals 5,000 tons. Yelang Lake of Puding county is a provincial level tourism site. As surveyed by relevant experts, it is planned to set up a daily domestic water treatment plant of 13,000 m3. Contact: Huang Wen / Zhou Xianbin TEL: +86 (53) 822 2137

Area	Projects
	10,000 ton/daily capacity Waste Water Treatment Plant Project Through joint investment, partnership, exclusive investment, and other methods, the Yunnan Yanglin Industrial Development Region (municipal development region) seeks investment. By the end of 2004, this region had established 70 projects and 28 of them had established businesses. Daily waste water capacity is 15,000 tons. This current project is to set up a Waste Water Treatment Plant of 10,000 tons/daily capacity at Longhe river to offer water treatment service to enterprises within the development zone. Investment methods preferred by the development zone management office are partnerships, joint investments and exclusive investments. Contact: Luo Jiafu, Chen Qingbo TEL: +86 (871) 604 5309
Guizhou Province	
Yunnan Province	

6.2 Active World Bank Environmental Projects in China

Project	ID	Product Line	Date Approved
Han River Urban Environment Improvement Project	P087224	IBRD/IDA	29.Apr.08
Anhui Highway Rehabilitation and Improvement Project	P099112	IBRD/IDA	22.Apr.08
Mainstreaming Climate Change Adaptation in Irrigated Agriculture Project	P105229	Global Environmen t Project	17.Apr.08
Shandong Minhe Poultry Manure Biogas	P102567	Carbon Offset	28.Mär.08
Gansu Cultural and Natural Heritage Protection and Development Project	P091949	IBRD/IDA	20.Mär.08
China Bengbu Integrated Environment Improvement Project	P096925	IBRD/IDA	11.Mär.08
CN-PCF-Meishan CDQ Projec	P104601	Carbon Offset	03.Mär.08
Guiyang Transport Project	P093963	IBRD/IDA	08.Jan.08
China Guangdong Huizhou CCGT project	P108516	Carbon Offset	19.Dez.07

China-PCF-Tianjin Landfill Gas Recovery and Utilization	P086035	Carbon Offset	29.Jun.07
China-GEF-Liaoning	P090375	Global Environmen t Project	26.Jun.07
China-Second Liaoning Medium Cities Infrastructure Project	P092618	IBRD/IDA	26.Jun.07
Western Provinces Rural Water Supply, Sanitation and Hygiene Promotion Project	P095315	IBRD/IDA	26.Jun.07
Micro and Small Enterprise Finance Project	P096285	IBRD/IDA	19.Jun.07
CN-Second Guangdong Pearl River Delta Urban Environment Projec	P081776	IBRD/IDA	21.Mär.07
Shaanxi Ankang Road Development	P075613	IBRD/IDA	13.Mär.07
CN-GEF-Second Shandong Environment Project	P090377	Global Environmen t Project	27.Feb.07
SECOND SHANDONG ENVIRONMENT PROJECT	P077752	IBRD/IDA	27.Feb.07
Third National Railway Project	P086515	IBRD/IDA	23.Jan.07
Guangxi Integrated Forestry Development and Conservation Project	P088964	IBRD/IDA	14.Dez.06

Guangxi Integrated Forestry Development and Conservation Project	P087318	Global Environmen t Project	14.Dez.06
CN-CF-Inner Mongolia Huitengxile Wind F	P087292	Carbon Offset	27.Okt.06
China-PCF-CDCF Hubei Guangrun Hydropower	P094795	Carbon Offset	27.Okt.06
Capacity Building for Highly Pathogenic Avian Influenza Prevention and Human Influenza Pandemic Preparedness	P104264	Recipient Executed Activities	18.Okt.06
Fujian Highway Sector Investment	P091020	IBRD/IDA	12.Okt.06
Sichuan Urban Development Project	P083322	IBRD/IDA	07.Sep.06
GEF-Ningbo Water and Environment Project	P090336	Global Environmen t Project	29.Jun.06
Facilitating Afforestation Program	P090649	Carbon Offset	29.Jun.06
Demonstration of alternatives to Chlordane and Mirex in Termite Control Project	P082992	Global Environmen t Project	29.Jun.06
China - Nanjing Steel Convertor Gas Recovery Project	P088106	Carbon Offset	29.Jun.06

Liaoning Medium Cities Infrastructure Project	P099992	IBRD/IDA	27.Jun.06
Changjiang/Pearl River Watershed Rehabilitation Project	P081255	IBRD/IDA	27.Jun.06
HENAN TOWNS WATER SUPPLY AND SANITATION PROJECT	P081348	IBRD/IDA	27.Jun.06
Third Jiangxi Highway Project	P093906	IBRD/IDA	27.Jun.06
China Economic Reform Implementation Project	P085124	IBRD/IDA	11.Apr.06
Follow Up to CRESP Phase I	P096158	IBRD/IDA	07.Feb.06
CN-Heilongjiang Dairy	P086629	IBRD/IDA	24.Jan.06
China HFC-23 Emissions Reduction and Sustainable Development Benefits Project	P094388	Carbon Offset	19.Dez.05
PCB Management and Disposal Demonstration Project	P082993	Global Environmen t Project	15.Dez.05
Fuzhou Nantai Island Peri-Urban Development Project	P070519	IBRD/IDA	15.Dez.05
China: Fifth Inland Waterways	P085333	IBRD/IDA	11.Okt.05
Irrigated Agriculture Intensification Loan III	P084742	IBRD/IDA	11.Okt.05
Shanghai Urban Environment APL Phase 2	P075732	IBRD/IDA	05.Jul.05

CN-PCF Xiaogushan Hydropower Project	P087153	Carbon Offset	22.Jun.05
POOR RURAL COMMUNITIES DEVELOPMENT PROJECT	P071094	IBRD/IDA	21.Jun.05
Chongqing Small Cities Infrastructure Improvement Project	P081161	IBRD/IDA	21.Jun.05
China - Renewable Energy Scale-up Program (CRESP)	P067625	Global Environmen t Project	16.Jun.05
Renewable Energy Scale-up Program (CRESP)	P067828	IBRD/IDA	16.Jun.05
LIUZHOU ENVIRONMENT MANAGEMENT PROJECT	P081346	IBRD/IDA	24.Mai.05
Agricultural Technology Transfer Project	P069862	IBRD/IDA	28.Apr.05
CN-Ningbo Water and Environment Project	P086505	IBRD/IDA	17.Mär.05
Heat Reform and Building Energy Efficiency Project	P072721	Global Environmen t Project	17.Mär.05
Inner Mongolia Highway and Trade Corridor	P068752	IBRD/IDA	15.Feb.05
CN-PCF Jincheng Coal Bed Methane Project	P087291	Carbon Offset	1-Dec-00
Hunan Urban Development Project	P075730	IBRD/IDA	16.Sep.04

TAI BASIN URBAN ENVIRONMENT PROJECT	P057933	IBRD/IDA	03.Aug.04
Italian Trust Fund for Environmental Protection in China	P088764	Recipient Executed Activities	30.Jun.04
Hubei Shiman Highway Project	P081749	IBRD/IDA	24.Jun.04
Guangdong Pearl River Delta Urban Environment Project	P075728	IBRD/IDA	08.Jun.04
CN-GEF Guangdong PRD Urban Env	P084003	Global Environmen t Projec	08.Jun.04
Hai Basin Integrated Water and Environment Management Project	P075035	Global Environmen t Project	15.Apr.04
Fourth Inland Waterways Project	P077137	IBRD/IDA	25.Mär.04
Pro-Poor Rural Water Reform Project	P088116	Recipient Executed Activities	19.Mär.04
Wuhan Urban Transport Project	P069852	IBRD/IDA	09.Mär.04
Zhejiang Urban Environment Project	P066955	IBRD/IDA	29.Jan.04
Jiangxi Integrated Agricultural Modernization Project	P065463	IBRD/IDA	20.Nov.03
Basic Education in Western Areas Project	P073002	IBRD/IDA	09.Sep.03

Gansu and Xinjiang Pastoral Development Project	P065035	IBRD/IDA	09.Sep.03
Gansu and Xinjiang Pastoral Development Project	P077615	Global Environmen t Project	09.Sep.03
Second Anhui Highway Project	P076714	IBRD/IDA	24.Jun.03
Shanghai Urban Environment Project	P070191	IBRD/IDA	17.Jun.03
Second Tianjin Urban Development and Environment Project	P040599	IBRD/IDA	20.Mai.03
Lake Dianchi Aquatic Biodiversity Restoration Project	P068239	GEF Medium Sized Program	26.Mär.03
Yixing Pumped Storage Project	P068058	IBRD/IDA	20.Mär.03
Energy Conservation Project, Phase II	P067337	Global Environmen t Project	24.Okt.02
Xinjiang Highway Project (03)	P058847	IBRD/IDA	05.Sep.02
Hubei Hydropower Development in Poor Areas Project	P068049	IBRD/IDA	25.Jun.02
Sustainable Forestry Development Project	P064729	IBRD/IDA	16.Apr.02

Sustainable Forestry Development Project (Natural Forest Protection)	P060029	Global Environmen t Project	16.Apr.02
Tuberculosis Control	P071147	IBRD/IDA	21.Mär.02
Liao River Basin Project	P051859	IBRD/IDA	19.Jun.01
Montreal Protocol Ozone Depleting Substances Phase Out Project (03)	P003409	Montreal Protocol	22.Jun.95
Ertan II Hydroelectric Project	P003507	IBRD/IDA	22.Aug.95
Montreal Protocol Ozone Depleting Substances Phase Out Project (04)	P039838	Montreal Protocol	

Contacts

6.2.1 National contacts

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Ministry of Science & Technology Department of Industrial Technology 15B Fuxing Rd, Beijing, China 100862 Tel: (86-10) 6851 2626 Fax: (86-10) 6851 5004	**State Environmental Protection Administration** (SEPA) International Cooperation Division and Foreign Economic Cooperation Office 115 Xizhimennei Nanxiaojie Beijing, China 100035 Tel: (86-10) 6615 1934 Fax: (86-10) 6615 3366
China National Technical Import and Export Corporation (CNTIC) Jiuling Building, 21 Xisanhuan Beilu Bejing, 100089, People's Republic of China Tel: (86-10) 6840-4106 Fax: (86-10) 6840-4105 E-mail: cntic@cntic.genertec.com.cn Internet: www.cntic.com.cn	**Ministry of Foreign Trade and Economic Cooperation (MOFTEC)** 2 Dongchangan Jie, Dongcheng Ku Beijing, 100731, People's Republic of China Tel: (86-10) 6708-1526 Fax: (86-10) 6708-1513 Internet: www.moftec.gov.cn
Ministry of Land and Natural Resources (MIR) 64 Fuchengmennei Dajie, Xicheng Qu Beijing, 100812, People's Republic of China Tel: (86-10) 6612-7001 Fax: (86-10) 6617-5348	**Ministry of Water Resources (MWR)** 2 Baiguang Lu, Ertiao, Xuanwu Qu Beijing, 100761, People's Republic of China Tel: (86-10) 6320-3069 Fax: (86-10) 6320-2150

State Environmental Protection Administration (SEPA) No.16 Guangqumenneidajie, Chongwen District Beijing, People's Republic of China Tel: (86-10)-6711-6195 Fax: (86-10) 6711-6195 E-mail: info2@zhb.gov.cnInternet: www.zhb.gov.cn	
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6.3 Chinese Institutes, Research Centres, and Associations

Environmental Science Research Centre, Xiamen University Huandao Rd., Xiamen, Fujian 361005 Tel: (86-592) 218 7783 Fax: (86-592) 209 5242	**New Technology Development Centre (NIDC) of China Association for Science & Technology** (CAST) No. 86 Xueyuan Nan Rd., Haidian District, Beijing, China 100081 Tel: (86-10) 6217 9149 Fax: (86-10) 6210 3249
The Association of Municipal Environmental Sanitation of China Shangjialou, Chaoyang District Beijing, China 100028 Tel/Fax: (86-10) 6467 1214	

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