

## Environment Profile<sup>1</sup> - SHNGI, China

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## 1. SECTOR OVERVIEW

The Yangtze River Delta (YRD) incorporates Shanghai and the surrounding provinces of Anhui, Zhejiang and Jiangsu. With Shanghai at the forefront, the Delta is one of China's largest economic regions and has pulled ahead of the rest of the country in terms of foreign investment, market size, regional GDP per capita, trade and consumer spending. However, this surging economic development is placing strong pressure on the environment.

The central and local government is aware of the impact on the environment and has taken many corrective measures. There are new laws as well as improved enforcement of existing rules. The government is investing heavily into environmental protection and clean energy. In the 11<sup>th</sup> Five-Year Plan (2006-2010), the central government announced it would invest 3 percent of its annual GDP in the environment sector, translating to RMB130 billion of investments in the YRD alone. The Yangtze River Delta is home to more than 2000 enterprises, in the environmental protection sector, employing over 180,000 workers and boasting an output value reaching RMB10.8 billion. Over the past decade, the number of firms engaged in the environmental protection sector has quadrupled and the number of workers employed in the sector has increased six folds.

To tackle the wide-spread global financial crisis, the Chinese government has come up with a fiscal stimulus package of 4 trillion RMB for the next few years. Though they remain very general in nature, most announcements have been tied up closely with public infrastructure projects, including environmental projects. This may increase largely the previously planned spending in environment.

For example, the Shanghai municipal government has recently announced the outline of the Shanghai Fourth - Round Three – Year Environmental Protection Action Plan, starting in 2009 and ending up in 2011. Under this action plan, the municipal government will invest some RMB 80 billion (about \$16 billion) in more than 200 projects. The aim is to improve the quality of the environment through various initiatives. Details for the 200 projects have not been disclosed though, these projects will fall into eight categories: 1) improving environmental infrastructure, 2) enhancing energy conservation and environmental protection, 3) promoting public transportation and vehicle emission controls, 4) environment rehabilitation and remediation, 5) promoting a circular economy and low-carbon economy, 6) promoting green construction and

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ecological conservation, 7) regional cooperation in the Yangzi Delta Region, 8) strengthening environmental management.

By 2011, the anticipated effects or targets from these projects include: 1) total volume of SO<sub>2</sub> and CO<sub>2</sub> emissions controlled at the level of 380,000 tons and 259,000 tons respectively, 2) 90%+ domestic sewage under treatment treated, 3) 85%+ domestic waste is safely disposed of, 4) 13.1m<sup>2</sup> green space per capita is reached with a 38.2% greenery coverage rate.

**Main Investors:** The government still plays a very important role in environment projects. The three main sources of funding include the central government – 11%, local governments – 34% and businesses – 55%.

**Market Demand:** Most funding has been targeted towards air pollution prevention, water pollution prevention, and solid waste treatment. Market demand is concentrated in the following fields:

- Municipal sewage treatment and industrial waste water treatment (organic waste, heavy metals, oil, chemicals, pharmaceuticals)
- Air pollution (de-dusting, de-sulfurisation, vehicle emissions control)
- Municipal solid waste treatment
- Monitoring system (on-site and remote)
- Recycling and reuse of above waste
- Renewable energy

**Main Players:** The biggest players are Chinese companies, ranging from manufacturers, engineering companies to design institutes. In the small province of Jiangsu, there are two national-level industrial parks focusing on environmental Science and Technology. Yixing Industrial Park for Environmental Science and Technology is located in eastern Jiangsu and is home to over 100 companies. The other is the National Environmental New & Hi-Tech Industrial Park located in Suzhou and is dedicated to environmental technology transfer and trade. The province of Jiangsu is therefore one of the most concentrated manufacturing bases and environmental engineering service centers in China.

Foreign companies are also numerous with representation from Japan, Germany, US, France and Italy in the market. Large foreign companies are particularly active in the water field, such as Vivendi, Lyonnaise, Thames and Veolia. These companies are actively selling into the market as well as investing in the region. For example, Vivendi Water, a subsidiary of Vivendi Environment, won a 50-year contract through its joint venture in Shanghai to provide full service potable water production, network distribution and customer service to 1.9 million residents in Pudong. The total investment of the project is approximately US\$239 million.

Canadian companies active in East China are mainly small and medium sized companies. Some companies have already established a presence in China. Some others have exported equipment to China through local agents and distributors.

## 2. MARKET AND SECTOR CHALLENGES (STRENGTHS AND WEAKNESSES)

China has developed many environmental protection laws to keep pace with its rapid economic development. The laws that impact the environment industry include: The Law on Environmental Impact Assessment, Regulations on the Pollutant Discharge Fee System, and the Law on Renewable Energy.

**Financing and Tax:** To promote a market economy, the government is strongly encouraging private capital to finance infrastructure projects, an area once dominated by government spending. Business models such as Build-Operate-Transfer (BOT) and Transfer-Operation-

Transfer (TOT) are widely applied in municipal water/waste water and solid waste projects, and investors are usually provided with favourable taxation, land, electricity and credit guarantees to ensure profit. Large companies providing design, construction and operation have numerous opportunities, though not without risk.

For foreign SMEs, the main business opportunities are: consulting services associated with internationally funded projects, providing management and operational training services, and selling specialized equipment for specific technologies.

The market for import of equipment is rather limited except for some special cases. It is worthwhile to note that China is the international manufacturing base, and the locally made equipment dominates the market due to its lower cost and acceptable quality. However, opportunities exist for foreign companies interested in producing locally through WFOE or JV partnerships.

Whether a joint venture or a technology transfer business model is applied, it is important to consider Intellectual Property Right (IPR) protection. Both international and local legal service providers are available in China and can provide professional advice.

Finding a good partner/agent/distributor and setting up strategic alliances are effective ways to access the local market.

### 3. SUB-SECTOR IDENTIFICATION

**Water and Waste Water:** The Yangtze River Delta is abundant with natural water ways, however due to rapid industrialization and urbanization, rivers and lakes have been heavily polluted. For example in Zhejiang province, 20 percent of the rivers are deemed undrinkable and urban sewage and industrial waste remains the main source of pollution.

The market for water treatment is huge. The standard set by the State Environmental Protection Agency (SEPA) in 2001, specifies that the sewage treatment rate must reach 45% of all discharge and exceed 60% in cities with a population of over 500,000. The region boasts excellent potential for new technologies for small scale water treatment in communities, counties and buildings, though large urban cities like Shanghai, Nanjing, Hangzhou all claim to have reached the 60% sewage treatment rate. Be that as it may, industrial waste is still a severe challenge due to lack of effective technology and insufficient investment.

The treatment of sludge is another area where there is a lot of growth potential for effective technology. Contemporary technologies of interest include transformation of sludge into construction material or a source of energy.

**Solid Waste:** Domestic waste is increasing at a rate of 9% per year in average, but in big cities it can be up to 15%, as the case in Shanghai. Presently there are three treatment methods: Landfill (70%), High heat compost (20%) and Incineration (10%).

There is a demand for urban waste collection and transfer vehicles, auxiliary equipment, and landfills management technology. For example, the Shanghai government has launched a project for the collection and transfer of municipal waste during the Expo 2010 (May 1<sup>st</sup> - October 31<sup>st</sup>, 2010), which will require 200 high tech vehicles, not to mention the fleet of vehicles that are currently in use that will need to be replaced.

The government also wants to improve recycling of waste. Various recycling technologies are increasingly being sought after in the region.

**Air Pollution:** De-dusting, de-sulfurisation and vehicle emission controls are the three main areas of concern for China's air pollution control. In big cities within the Yangtze River Delta, vehicle emissions account for 60% of total air pollution. After having adopted the National II (similar to Euro-2) standards in 2004, China has enforced National III (similar to Euro 3) standard on new vehicles since 2008. The new standard measures the weight of pollutants and suspended

particles, thus resulting in a large reduction in carbon monoxide, hydrocarbons and nitrogen oxide emissions compared with the Euro 1 standard. These upgrades in standards have created extensive business opportunities for foreign technologies.

In north Jiangsu province, and Anhui province, acid rain, caused by power generation plants, is another concern. With the implementation of a new requirement to use low sulphur coal and to remove sulphur and particles, there is an increasing demand for flue gas de-sulphurisation equipment, electrostatic precipitators, coal cleaning and combustion technologies.

**Renewable Energy:** As China has committed to reducing its emission under the Kyoto Protocol framework, the country is looking for ways to maintain its industrial growth, while using clean and renewable technologies as viable a source for its energy needs. The central government has set a target to double the country's renewable energy generation capacity by 2020, reaching 10% of the total national energy consumption. More hydropower, wind power, solar energy, and biomass facilities will be built in the near future.

Among these technologies, wind power stands at the fore front. Shanghai, East Zhejiang and Jiangsu all have wind farms in operation or currently under construction. However, overall development of wind power, in the region, is still at the preliminary stages due to the huge investment required and the lack of an appropriate pricing system to ensure a return.

Solar energy in the Yangtze River Delta is currently limited to household applications.

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