

## **Sustainable Development of Shanghai Industry**

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### **1. General Introduction of Shanghai**

1.1 Shanghai, also called “Hu”, is located at 31°14’ north latitude and 121°29’ east longitude. Bordering on Jiangsu and Zhejiang provinces on the west and situating at the tip of Yangtze River Delta, Shanghai is washed by the East China Sea and Hangzhou Bay on the south. North of the city, the Yangtze River pours into the East China Sea. The city also occupies a central location along China’s coastline. Thanks to its advantageous geographic location, Shanghai is an excellent sea and river port, which also has an easy access to a vast hinterland. The city covers an area of 6,340.5 square kilometers, 0.06% of China’s total territory. By the end of 2002, Shanghai had a population of 13.3423 million (according to the residential registration), representing 1% of China’s total. The average population density in the city stands at 2,104 people per square kilometer. There are 67,961 registered enterprises that are engaged in manufacturing.

1.2 The national economy maintains of Shanghai consecutively rapid growth. In 2002, the Gross Domestic Product (GDP) in Shanghai was 540.876 billion yuan RMB, 10.9% higher than that in 2001 based on a comparable price, maintaining a consecutive two-digit percentage growth over recent eleven years. Restructuring of industrial sectors, particularly the development of secondary and tertiary industries, has pushed and consolidated the stable economic growth in Shanghai. The output value of primary industry was 8.824 billion yuan, 3% higher than that in 2001, whilst that of secondary industry was 256.469 billion yuan, 12.1% higher, and the output value of tertiary industry was 275.583 billion yuan, 10% higher. Proportion of the output values of the tertiary industries to GDP was increased up to 51%, and the comprehensive service function of the city is progressively improving.

### **2. Brief of the Comprehensive Plan of Shanghai**

#### **2.1 Designated Function of the City**

Shanghai is an important economic and shipping center, a famous historic city in our country, and will be constructed progressively into a socialist modernized metropolis and one of the international economic, financial, trading and shipping centers.

#### **2.2 Scale of City Development**

To limit the scale of population and land use in Central City, and to guide population and industry from Central City to suburban cities. By 2020, the actual residents in the City will be about 16 million, 13.6 million of which will be non-agricultural residents, the urbanization level will reach 85% and the land used for construction of concentrated urbanized area will be 1500km<sup>2</sup>. The planned population will be 600 km<sup>2</sup>; the planned population in suburbs will be 5.6 million.

#### **2.3 Goal of City Development**

By 2020, the City’s development goals are to preliminarily build Shanghai into one of the world economic, financial, trade, and shipping centers, to make Shanghai basically an international, economic hub. To give full play of Shanghai’s national and international functions as a link and pivot radiating influences both outward abroad and inward inland, further promote joint development of Yangtze River Delta and Yangtze River Economic Zone.

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### **3. Overall Strategy of Shanghai Industry**

3.1 As a result of fifty years of development, especially the big strides made in the past 20 years of the implementation of the reform and open policy, Shanghai has made established an integrated industrial system, which is considerable in scale in aggregate terms. 2002, the value added by the industrial sector of the city totaled 231.28 billion yuan, accounting for 43% of the GDP. Whether at present or in the future, industry will always play a significant role in economic development and social stability in the city. The effective implementation of sustainable development strategies in the city depends to a large extent on the sustainable development of industry.

3.2 Since the beginning of 1990s, considerable progress has been made in the strategic adjustment in the industrial structure and distribution of the city. The proportion of hi-tech industries and the six mainstay industries in the industrial output value of the city has significantly increased and the technology contents in the traditional sectors have also increased. As a result of the adjustment in the industrial structure, the value added created by Shanghai industry has increased at considerably high speed, while energy and raw material consumption has increased at a relatively show rate. Meanwhile, the discharge of the industrial waste has also declined considerably. However, it must be pointed out that the industrial waste remains the main source of pollution for the environment in the city. The consumption of energy and raw materials in industry has continued to bring great pressure on transportation in the city. The utilization efficiency of some of the land used for industrial purposes in down-town areas and water resources is quite low and industrial production is still making its impact felt on the life of the residents and the environment. Industrial zones are generally quite large in scale, with projects widely distributed. Waste of farmland in rural enterprises is quite serious. Generally speaking, technology progress, has not yet become the main driving force for industrial development. Extensive operations are still common. As a result, there is still along way to go before sustainable development can be achieved in industry.

3.3 The overall objectives of sustainable development of industry in the city are: to rely on scientific and technological progress, to build a new industrial height and establish and industrial structure dominated by high technology, with its focus shifted from labor-intensive and resource-intensive sectors to resource-saving and technology-intensive sectors; to maintain sustainable and fast growth of industry while greatly reducing the discharge of industrial pollution and consumption of energy and materials; and to build a framework for cleaner production.

## **4. Established an Industrial Structure Dominated by High Technology**

### **4.1 Basis for Action**

4.1.1 For a long time, Shanghai, as the largest industrial base in China, has boasted a rather well round industry system, with well-developed light, equipment and raw material industries. In 1980s, energy and raw material sectors, such as power generation, iron and steel and petroleum-based chemical industries were given the priority in its development program. In the early 1990s, heavy industry began to outstrip light industry. 1990s saw the beginning of strategic adjustment in industrial structure, focussing on the development of high and new-tech sectors and the fostering of six mainstay sectors. The proportion of high-tech industries in the total industrial output has increased from 2-3% in 1990 to 15.1% in 1987 and that of the six mainstay sectors from 34.5% to 52.3% during the same period. The upgrading of the industrial structure has made it possible for value added created by industry in the city to grow at a sustained high speed of 14.4% and for consumption of materials and energy and the discharge of pollutants to register a sharp decrease in the period of the eighth Five -Year Plan.

4.1.2 There is still a long way to go before the industrial structure in Shanghai can meet the requirements of sustainable development. The proportion of high-tech sectors is still on the low side, its mainstay industries are characterized by their extensive growth and technological contents of products are not high with low value added. In particular, material and energy consumption in the steel and petro-chemical sectors is quite high, using a lot of land and water resources. The adjustment in the traditional industrial sectors is constrained by pressures from the need for reemployment, slow upgrading of products, high per-unit material and energy consumption and waste discharge.

### **4.2 Objectives**

4.2.1 By 2005, total industrial consumption of energy and raw material and discharge of pollutants will be sharply reduced, as will per-unit product value consumption and discharge.

4.2.2 By 2010, the industrial structure will initially meet the requirements for the city to become an international economic center. The development of industry and the tertiary sector, as well as that of industry and the environment will be mutually reinforcing and coordinated.

### **4.3 Activities**

4.3.1 Speed up the development of high-tech sectors. It is necessary to increase the input in the three high-tech sectors of information, modern biomedicine and new materials so that they will become the new mainstay industries in Shanghai in the 21<sup>st</sup> century. The industrialization of those high technologies, which have already developed an industrial foundation, such as photo-electronics and electromechanical integration, will be accelerated. The development of Zangjiang and caohejing high and new-tech parks will be sped up so as to give full play to their role as incubators for high-tech industries and the bases for R&D, education and training.

4.3.2 Rely on scientific and technological progress to expand and upgrade mainstay industries. Input should be increased to develop economics of scale. Brainstorming efforts should be reinforced so as to facilitate technological innovations and expand R&D capacity for products. The application of new and high technologies should be promoted and the industrial structure and product mix of mainstay sectors upgraded so as to reduce resource and energy consumption as well as the discharge of pollutants and wastes.

4.3.3 Adjust and upgrade traditional industries. It is necessary to step up efforts to relocate these industries to resource- and energy-producing areas through asset reorganization, optimized grouping and stock liquidation. As to those sectors whose development is viable in the city, their state assets should be possessed by outstanding business managers, outstanding enterprises or famous brands. R&D of new products should be stepped up and the introduction of high technology in traditional sectors encouraged.

4.3.4 Develop urban-type industry. It is necessary to focus on the development of industries that bring little or no pollution and generate high value added and considerable job opportunities, such as garments and dress ornaments, food stuff, toys, package design and printing, interior decoration, arts and handicrafts as well as tourist souvenirs production.

4.3.5 Foster and develop high-level environmental industries. Carry out R&D on technologies and equipment for wastewater disposal; smoke purification, noise abatement, solid waste disposal, garbage incineration, and environmental monitoring, comprehensive utilization of resources and cleaner production. Promote the development of such industries as environmental protection consultation and designing as well as environmental monitoring so that by 2005, a fairly well-round environmental industrial system will be in place, which will become a new growth area in industrial development and provide technical and equipment support for its sustainable development.

## **5. Adjusting and Optimizing the Physical Distribution of Industry**

### **5.1 Basis for Action**

5.1.1 Considerable progress has been made in the adjustment of the industrial distribution pattern in Shanghai. Since the beginning the 1990s (up to the end of 1997), adjustments have been made to 892 production points inside the inner ring, involving 573 enterprises covering an area of 3.314 million square meters, thus contributing to the beautification and prosperity of the downtown area. At the same time, 9 municipal-level industrial zones have been opened. However, the irrational industrial distribution pattern in the center of the city has not been thoroughly changed. New problems have emerged in the course of distribution adjustment.

5.1.2 At present, there are still too many factories in the downtown area, with residents plagued by their three wastes (wastewater, waste gas, solid waste) and noises, and their own expansion greatly constrained. The proportion of land use for industrial purpose in the downtown area is markedly higher than that in similar cities abroad. Differential land rents have not yet fully implemented.

5.1.3 The newly established industrial zones in the suburbs have not brought about concentration of industry in these areas. By the end of 1997, there were 7 state-level industrial zones, 23 municipal-level

development zones and 37 district- or county- level industrial development zones in the city, covering a planned development area of 453.1 square kilometers, of which 209.7 square kilometers have already been developed. As a result of the over large scale of development and wide dispersion of projects, the level of intensity in land use is quite low and the expected concentration has failed to come to pass. The widely distributed and rural industry, instead of contributing to industrial concentration, has made pollution control difficult and hampered the urbanization of the rural area.

## **5.2 Objectives**

5.2.1 In consideration of the functions defined for Shanghai as a city, it is necessary to adjust the industrial distribution in the downtown area and develop urban –type industry to a reasonable extent. Industrial establishments should be concentrated in the industrial zones in the suburbs so as to benefit from such concentration and economics of scale. As a result, the downtown area of the city will be a bustling scene of prosperity, while its suburbs will represent its strength and high standard.

5.2.2 By the end of 2000, in the downtown area within the Inner Ring, one third of the production points have closed down, suspended operation, amalgamated with others, switched to the manufacture of other products or to tertiary industry on the original sites. Another one third have moved to other areas, made adjustments in their industrial structure and product mix and updated their technology. The remaining one third was urban-type industrial production points and was allowed to stay. By 2005, industrial zones at different levels will all have a rational layout, appropriate scale, beautiful environment, remarkable economic efficiency and good management. At the same time, they will enter a virtuous circle of self-development and management.

5.2.3 By 2010, an industrial distribution pattern appropriate to a modern cosmopolitan city will be in place.

## **5.3 Activities**

5.3.1 Accelerate the implementation of the plan for factories inside the Inner Ring to close down, suspend operation, merge with others, switch to the manufacture of other products or relocate. Most of those to be relocated are to be concentrated in the suburbs, while a small part will move to other provinces or cities.

5.3.2 Optimize investment environment in the industrial parks and raise the level of intensity in the development of these parks. In line with the orientation guidelines for industrial development, some larger projects will be encouraged to locate in those parks with better comprehensive conditions. A few poorly developed parks will be adjusted, reduced in size, closed down or merge so as to achieve concentration of funds, human resources and materials and increase efficiency of park development. By so doing, industrial parks in the suburbs will be better focused and have their own characteristics.

5.3.3 Strictly limit the widely dispersed siting of rural industrial enterprise and encouraged these enterprises to be concentrated in market towns or those municipal – or county-level industrial zones that have reached a considerable scale so as to integrate the development of rural industry with the construction of small towns.

## **6. Summary**

### **6.1 Layout of Industries**

From viewpoint of integral development of Shanghai and Changjiang Delta region, according to local density and industrial connection to arrange industries rationally and develop concentratively and collectively. **Three levels of city industries layout:**

6.1.1 First level: Urban area within Inner Ring Road. Tertiary industry is the major with appropriate reservation of city-type industry. To push forward the expansion of tertiary industry range, raise its level, perfect its functions, expand the area, and renew its mode. To make great development in finance, insurance, securities, shipping and transportation, information consultation, trade and circulation, real estate, city tourism, community service etc. with the priority of developing information industry forming a comprehensive service function matching with modernized international metropolis.

6.1.2 Second level: Urban area between Inner and Outer Ring Roads. High-tech, high valued-added, non-pollution industry is the major. To rearrange, renovate and improve existing industry zones. Between

the Inner and outer Ring Road the major will be city-type industries, high-tech industries and supporting industries.

6.1.3 Third level: Area outside Outer Ring Road. Development of first and second industries is the major. To heighten economy scale and collectively, concentrate to the construction of city level industrial zones and development of actively modernized agriculture and suburb tourism. Outside the Outer Ring Road will be steel, petrol chemical and automobile industries.

### **‘1+3+9’ Planned Industrial Parks in Shanghai**

‘1’ means state-level open and development zone	Pudong New Development Zone
‘3’ means state-level industrial parks	CaoHejing, MingHang, SongJiang (processing for exporting)
‘9’ means municipal-level industrial parks	SongJiang, KangQiao, JiaDing, Comprehensive Industrial Park, XinZhuang, JinShanzui, QingPu, ChongMing

### **6.2 Incentives Policy**

To encourage the enterprises relocating in the planned industrial parks, Shanghai Municipal Government has issued a lot of favorite policy, for example, after relocation the enterprise are allowed to get great commercial profits from use right transfer of its original land in the central urban area. Meanwhile, the government provides the relocation enterprises with subsidy and favorite loan at lower interests. Part taxes are exempted for several years after the enterprise relocation to the planned parks, even the special loan is exempted if the relocated enterprise has a good performance in environmental field. From 1986 to present, there are totally 2,700 enterprises (including workshops) relocated to the planned industrial parks.

### **6.3 Organizers for Relocation**

On behalf of Shanghai municipal Government, Shanghai Economic Commission, Shanghai Municipal Bureau of Environmental Protection, Shanghai Financial Bureau are in charge of industrial relocation. Annual program for enterprises relocation is jointly formulated by the three organizers with most considerations of environmental priority based on the public complaints and location sensitivity.

### **6.4 Environmental Improvements**

The planned industrial parks should construct appropriate environmental infrastructures, i.e. wastewater treatment plants, district-heating system, clean fuel provide system. Meanwhile the relocation enterprises are required to improve production technology (much more clean), to comply with national and local environmental laws, regulations and standards.