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China's Household Air Conditioner Industry

Background

The market for air conditioners in China has developed rapidly over the past decade and the sector now consumes almost 10 terawatt-hours of the nation's electric power each year. China recently put in place several policies to accelerate reform in the residential housing system and to upgrade technical inadequacies in the electric power network in urban areas. These actions provide a renewed opportunity for the Chinese household appliance market to develop, especially for air conditioners and refrigerators. As a result, residential energy consumption is set to increase. Continuing to improve the energy efficiency of air conditioners and other household appliances is thus a crucial task.

To meet this challenge, the China State Economic and Trade Commission (SETC) together with Lawrence Berkeley Laboratory (LBL) are applying to the Global Environment Facility (GEF) to fund a project to transfer technology to China's household air conditioner market. The purpose of this project is to raise the energy efficiency of room air conditioners, promoting this industry's healthy development, and strengthening its technical capacity. In order to provide background materials for the application to GEF, Beijing Energy Efficiency Center (BECon) and the World Wildlife Fund for Nature (WWF) jointly completed a report "Household Air Conditioner Industry Development and Market Analysis in China"¹ that is summarized in this issue of *BECon's News*.

Development of China's Household Air Conditioner Industry

Three phases have marked the development of China's household air conditioner industry:

A. Start-up Phase (1985 - 1990)

Low income levels and electricity shortages constrained output and sales of household air conditions through the mid-1980s. In 1984, the output of air conditioners just exceeded 60,000 units. Following the increase in national economic development, the

¹ This document, entitled "Zhongguo Jiayong Kongtiaoqi Chanyede Fazhan yu Shichang Fenxi" is only published in Chinese.

market demand for air conditioners grew rapidly from the mid-1980s to the end of the 1980s. The government regarded the growth of the household electric appliance industry as an important step in national industrial policy. Steps were also taken to boost electric power supply. China also began importing air conditioner production lines to improve quality and economies of scale.

B. Consolidation Phase (1990 - 1995)

During this period, the Chinese air conditioner industry achieved tremendous advances and gradually formed an ordered market through competition.

Imports of air conditioner production lines reached a peak in the early 1990s. Enterprises introduced these production lines from abroad to improve quality and economies of scale. At one point in the mid-1990s there were over 300 air conditioner manufacturers and assembly plants in China. But the production capacity of some of these manufacturers was only about 1,000 units each year, resulting in poor economies of scale.

At the same time, the market became rapidly oversupplied. According to statistics from the China Light Industry Information Center, the total production capacity of 47 air conditioner manufacturers in 1993 reached 10.2 million units, while market demand was only 5-6 million units. From this point onward, the Chinese air conditioner industry became extremely competitive.

Manufacturers with powerful financial and technical capacity quickly developed their markets and enhanced their positions through pricing strategies, higher technical efficiency, improved product quality, and marketing and service activities. Small manufacturers were eliminated from the market. The national production capacity shrunk through 2-3 years of industrial consolidation. By 1995, only 20 large enterprises survived and formed the backbone of the industry. Air conditioner producers achieved economies of scale during this period.

C. International Competition Phase (1995 to the present)

After the mid-1990s, the Chinese air conditioner market entered into a period of more robust international competition. Transnational corporations entered the Chinese market, especially those from Japan. They established joint venture plants using advanced technology that further intensified competition within the industry.

The evolution of household air conditioner production in China now exhibits the following features:

- ☞ *Rapid growth in output since the early 1990s*
- ☞ *Increasing competition, especially from international corporations*
- ☞ *Greater difficulty in developing new types of products*
- ☞ *Production costs and services becoming the decisive factors in competition*
- ☞ *Declining revenue in production*

Household Air Conditioner Production in China

In 1993, there were over 100 air conditioner manufacturers in China, but only 23 of them had production capacity of more than 500,000 units, and only 14 were capable of producing 200,000-400,000 units a year. The total output of these 37 manufacturers was about 1.93 million units, amounting to two-thirds of the national total in that year. But by 1997, China had 7 manufacturers with production capacity of over 1 million units. The output of air conditioners and production capacity by region are shown in Tables 1 and 2, respectively.

Table 1. Air conditioner output in China

Year	Output(thousand unit)	Year	Output (thousand unit)
1980	13	1991	592
1984	61	1992	1520
1985	123	1993	2918
1986	89	1994	3820
1987	122	1995	6800 (5500)
1988	244	1996	7600 (7200)
1989	245	1997	9700 (9500)
1990	220	1998	(8500)

Source: China State Statistical Bureau. Figures in brackets are provided by the air conditioner industry.

Table 2. Distribution of Air Conditioner Production Capacity in China in 1997

Key manufacturer	Brand	Production Capacity (million)
<i>South China</i>		<i>7.3</i>
In Which:		
Zhuhai Geli (Group) Electric Appliance Ltd. Corp.	Geli	2.5
Guangdong Meidi (Group) Electric Appliance Ltd. Corp.	Meidi	1.5
Guangdong Huabao Air Conditioner Plant	Huabao	1.0
Guangdong Kelong Group	Kelong	0.5
<i>East China</i>		<i>6.8</i>
In Which:		
Chunlan (Group) Electric Appliance Ltd. Corp.	Chunlan	2.0
Haier Group Corp.	Haier	0.8 (1998)
Shanghai Sharp Electric Appliance Ltd. Corp.	Sharp	1.0
Hefei Daxipu Electric Appliance Ltd. Corp.	Feige	1.2
<i>Northeast China</i>		<i>0.4</i>
In Which:		
Shengyang Sanyo Air Conditioner Ltd. Corp.	Sanyo	0.4
<i>Southwest China</i>		<i>1.0</i>
In Which:		
Sichuan Changhong Electric Appliance Ltd. Corp.	Changhong	1.0 (1998)
<i>Total</i>		<i>15.5</i>
<i>National total of 32 manufacturers</i>		<i>19.0</i>

The production capacity of compressors matched with the air conditioners is given in Table 3.

As seen in Tables 2 and 3, air conditioner production capacity is still concentrated in Guangdong and the East China. This situation is changing however due to increased market demand in other parts of China, especially in the southwest and northern

regions.

**Table 3. Production Capacity of Key Compressor Manufacturers in 1997
(for air conditioner use)**

Manufacturer	Brand	Production Capacity(million)
Northeast China		0.6
Shengyang Huarun Sanyo Compressor Ltd. Corp.	Sanyo	0.6
East China		1.80
Shanghai Hitachi Electric Appliance Ltd. Corp.	Liangba	1.80
South China		3.00
Guangzhou National Wanbao Compressor Ltd. Corp.	National	1.40
Guangdong Toshiba Wanjiale Refrigeration Ltd. Corp.	Toshiba	1.20
Hualing Compressor Ltd. Corp. of Guangzhou Mitsubishi Motor	Mitsubishi	0.40
Northwest China		1.15
Xian Qingan Group	Qingan/Dutch	1.15

Source: China Light Industry Information Center.

Import and Export Trends

Chinese domestically-manufactured air conditioners have continuously improved in performance and quality, helping to lower the number of imported units each year since 1994. (See Table 4.)

Table 4. Air Conditioner Imports from 1993 to 1997

Items	1993	1994	1995	1996	1997
Window and Split type	58,908	136,371	84,575	46,542	10,506
In which: with both cooling and heating function	45,024	66,955	75,256	15,702	6,015
National Total	194,226	342,077	224,929	127,329	32,327

Source: China Light Industry Information Center.

Even though exports of air conditioners are expanding rapidly, almost 90 percent of the units made in China are for domestic consumption. (See Table 5.)

Table 5 Air Conditioner Exports from 1994 to 1998

Items	1994	1995	1996	1997	1998
Air Conditioner	125,000	410,000	500,000	800,000	1,200,000

Source: China Light Industry Information Center.

Classification of Air Conditioners

In 1996, China updated the standards for production of air conditioners. All manufactured products must accord with the national standard code GB/T 7725-1996. This standard is basically similar to ISO-5251. The types of air conditioners generally

used by Chinese residents are window, split, and split cabinet units. The split air conditioner became the dominant type after 1995. (See Table 6.)

Table 6. Types of Air Conditioners in 1997

Items	Split-unit	Window-unit	Split Cabinet	Mobile-unit
Percentage	57	22	20	~1

Source: China Light Industry Information Center.

At present, China does not have statistical information on the percentage of room air conditioners in the domestic market based on the cooling capacity. The following figures are were obtained from a residential air conditioner survey conducted by ICF in China. (See Table 7).

Table 7. Classification of Air Conditioners by Cooling Capacity

Cooling capacity	<1500W	2500-3300W	>3300W
Share (%)	<5	~85	<10

Source: China Light Industry Information Center.

China produced 6,000 heat pump air conditioners in 1990, but this number had expanded to 3.5 million by 1997 and accounted for 43 percent of the national total. (See Table 8.) The market demand for heat pump air conditioners is growing rapidly.

Table 8. Heat Pump Air Conditioner Output in China

Unit: Thousand

Year	1990	1993	1994	1995	1996	1997
Heat Pump Air Conditioner	6	240	650	1800	3000	3200

Source: China Light Industry Information Center.

Frequency converting air conditioners—noted for the high efficiency—are still at an early stage of development in China. In Japan, by contrast, they account for over 80 percent of the market. China started to conduct research and development on these units beginning in the 1990s, but progress has been slow. Frequency converting compressors must still be imported from Japan, limiting the market share of this type of air conditioner in China to only 1 percent.

Technical Performance of Chinese Air Conditioners

Minimum energy performance standards were established in 1989, but have not been updated since. The standard for air conditioner production was updated in 1996 (See Tables 9 and 10.) Therefore, minimum energy performance standard legs far behind of production standard. China needs to upgrade the energy performance standards for air conditions and can do so via the Energy Conservation Law that was passed in November 1997.

Table 9. National Standard Code (GB/T 7725-1996) for Air Conditioner Production

Rated cooling or heating generation (W)	EER, COP (W/W)	
	Window-unit	Split-system
<2500	2.45	2.65

2500-4500	2.50	2.70
>4500-7100	2.45	2.65
>7100	2.50	2.50

**Table 10. National Standard Code (GB 12021.3-1989)
for Energy Performance of Air Conditioners**

Nominal cooling generation (W)	EER (W/W)	
	Window-unit	Split-system
<2500	2.20	2.30
2800-4500	2.26	2.37
>4500	2.32	2.44

Development of the Household Air Conditioner Market

By the end of 1997, air conditioner ownership per 100 urban households exceeded 16. (See Table 11.) In Shanghai and Guangdong, it exceeded 60 percent. Nationwide, residential ownership of air conditioners reached 11,280,000 units at the end of 1997 with electric power usage reaching nearly 3.4 terawatt-hours.

Table 11. Air Conditioner Ownership Per 100 Households, 1994-1997

Year	1994	1995	1996	1997
National average	5.00	8.09	11.61	16.29
Beijing	5.00	11.80	14.20	27.60
Shanghai	19.60	33.20	49.80	62.00
Guangdong	30.11	41.2	54.90	63.68

Source: China Economic Statistics Yearbook, 1998.

Forecasts for future production of air conditioners in China depend on many variables. Experts considered the following in estimating the output of air conditioners through 2010 (See Table 12.):

- ☞ Residential income
- ☞ Current possession of air conditioners in urban and rural areas
- ☞ Housing reform in urban areas
- ☞ Electric power network renovation in urban areas and construction in rural areas
- ☞ Population growth rates in urban areas
- ☞ Change in the structure of living expenditures
- ☞ Climate change

China exports a small quantity of air conditioners, but most are consumed domestically so the estimated output figure is more or less the same as the market demand.

Table 12. Forecast of Air Conditioner Output in China

Unit: Million

Year	1997	1998	2000	2005	2010
Air Conditioner	7.50	9.00	10.00	11.50	15.00

Source: Estimated by experts from China's electric appliance circle.

Problems Facing the Household Air Conditioner Industry

(1) Stagnant Innovation

The production structure in some key domestic enterprises indicates that they manufacture nearly identical products using identical technology. It is therefore difficult for them to keep up with the changes in the market.

(2) Emphasizing supply-side production

In order to maintain their market share in the face of stiff competition, a number of enterprises focus exclusively on supply-side scale of production as the essential prerequisite. They attempt to control the market through economies of scale. They neglect the importance of external markets, improving internal management, and cost control as the basis for improving economic efficiency.

(3) Overcapacity

Production capacity for refrigerators, clothes washers, and room air conditioners exceeds market demand by over 100 percent, reaching 20, 21, and 18.5 million units, respectively. Overcapacity is due mainly to the new projects started since 1995 and the recent downturn in domestic consumption resulting from economic reform. The production capacity of air conditioners manufactured by joint ventures was about 5 million units, whereas well-known domestic brands totaled nearly 9 million units in that year.

Furthermore transnational corporations entering the Chinese market are another contributor to overcapacity. Since 1998, Japanese joint ventures have lowered the price of air conditioners by 300-600 yuan while domestic manufacturers increased the price of air conditioners because of the improved quality, after-sale service, and the market development. Through these actions, the price differential between the units has narrowed.

(4) Insufficient research on strategy development

Chinese enterprises have not yet studied the market from the perspective of strategy development. They still rely solely on price as a tool to master the market. If enterprises make correct market analyses and create appropriate strategies suitable for their development, they would improve their competitive standing.

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