Chinese Business Guide

(Electronic Industry Volume)

China Council for the Promotion of International Trade

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Contents

Electronic information industry is a basic, pioneering and pillar industry in Chinese economy, playing an important role in modernization and the process of building a well-off society in an all-round way. In 2005, endeavours have been made to expedite industrial development, promote independent innovation capabilities, push the communication in rural areas, strengthen market regulation, boost informatization, and guarantee network and information security in Chinese electronic information industry, which contributed to Chinese economic and social development.

In 2005, the increment value of electronic information industry was 1,320 billion yuan, accounting for 7.2% in GDP. The increment of electronic information industry was 901.1 billion yuan, and communication industry 415.69 billion yuan. The sales revenue of electronic information industry was 3840 billion yuan, and the export amount of electronic information products was US$268.17B. The number of fixed line users in China was 350 million, and mobile phone subscribers 390 million. The total number of phone subscribers was 740 million. The communication network size and the number of subscribers remained at the first place in the world. The number of netizens exceeded 100 million and ranked at the second place.

II. Communication industry development

In 2005, the total communication service amount was 1200 billion yuan, increasing by 23.8%. The

amount for telecom sector was 1140.3 billion yuan, increasing by 24.7%, and post sector 62.55 billion yuan, increasing by 10.8%. The sales revenue of electronic information industry was 641.73 billion yuan, increasing by 11.1%. The sales revenue of telecom sector was 584.01 billion yuan, and post 57.72 billion yuan. The increment value of telecom sector was 415.69 billion yuan, and the fixed asset investment in telecom sector was 214.18 billion yuan.

(I) Telecom development

In 2005, the total amount of telecom services in China was over 1000 billion yuan. The number of the Internet visitors reached 100 million. Broadband was widely spread. The phone is available to more villages. The fixed asset investment exceeded 200 billion yuan for consecutive six years. The ratio of investment to return decreased to a half of the ratio at the end of the Ninth Five-year Plan, indicating the investment became more reasonable and effective. The telecom sector development area was widened, the communication market became mature, the service quality was largely improved, the telecom regulation system was gradually improved, the regulation measures turned more scientific and comprehensive, an orderly market competition pattern was being formed, and capital pluralism process was advanced. Among 17,300 value-added telecom companies in China, 97% are non-public ownership companies and companies containing non-public capital. In the basic telecom sector, there are over 60 companies containing non-public capital.

1. The telecom industry continued developing and achieved the objectives designated in the Tenth Five-year Plan.

In 2005, the objectives specified in the Tenth Five-year plan for Chinese telecom industry have been all realized. The total telecom service amount grew rapidly to 1140.3 billion yuan, increasing by 24.7% than 2004. The income growth was relatively stable in telecom industry. The service income in 2005 was 584.01 billion yuan, increasing by 11.4% than 2004. The service income accounted for 3.2% in the total GDP. In this industry, the value increment was 383.1 billion yuan, accounting for 2.3% in the total GDP. The number of telecom users also grew. By the end of 2005, the number of Chinese phone subscribers was 740 million, and the phone popularization rate was

57.3 phones in every 100 people.

In 2005, the sales amount of major telecom services rapidly grew. The number of local calls and calls between local networks was 622.24 billion, increasing by 5.6%. The calling time of fixed line toll phone was 89.42 billion minutes, increasing by 20.6%. The calling time of mobile phone was 1250.74 billion minutes, increasing by 32.3%, where the calling time of mobile toll call was 71.26 billion minutes, increasing by 18.1%. The calling time of IP phone was 134.02 billion minutes, increasing by 16.6%. The number of short messages was 304.63 billion, increasing by 40.3%.

The scale, number of subscribers and service amount increased fast. This indicates that Chinese telecom industry is in a stable development stage, and that the economy and the society increasingly demands telecom services. The telecom industry plays a more and more important role in economic and social development, and its basic and pioneering status becomes more and more obvious.

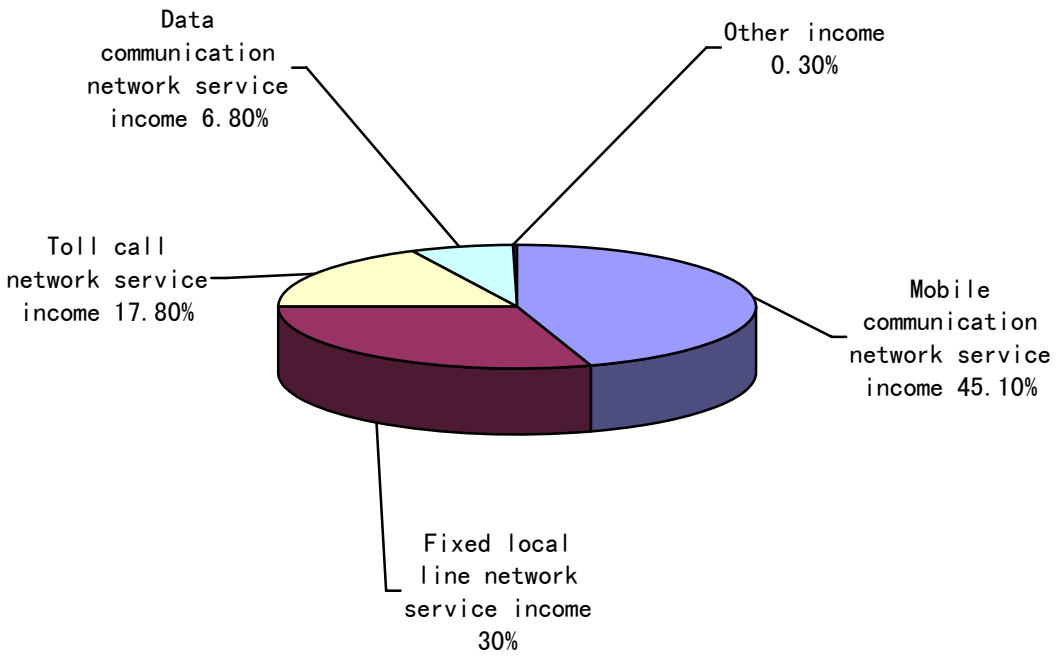
2. The growth rate of phone subscribers decreased, mobile phone service stimulated the industry, and a large proportion of the Internet users choose the broadband.

In 2005, the number of new phone users in China was 97.27 million, which was 16.61 million lower than the increment of 2004. The growth rates of both fixed line and mobiles decreased. The decrements of new fixed line and mobile users were respectively 10.32 million and 6.29 million. The proportion of new PHS users in the new fixed line users decreased by 3.5% than 2004. The PHS service didn't boost fixed line service as energetically as before.

Mobile service became more powerful than fixed line service. In 2005, the number of new mobile subscribers was 1.5 times of new fixed line subscribers. When PHS service with mobile communication features was included in mobile service, the multiple would be 4.3.

The revenue structure of 2005 was almost the same with that of 2004. The proportions of mobile service and data communication network service slightly went up, and the revenue proportions of fixed line local phone network service and toll call network service shrank.

Figure 1. Telecom revenue structure of 2005



In 2005, the number of Chinese netizens was 111 million, continued with a rapid growth rate. The Internet dissemination rate was 8.6%. The broadband access mode became more popular. In China, the number of broadband users was 64.3 million, accounting for 57.9% in the total netizens. The broadband has become the most popular access mode.

More and more dial-up users of basic telecom operators turned to the broadband. In 2005, the decrement of dial-up users was 15,627,000, and the increment of broadband users was 12,425,000. The total number of broadband users reached 37.35 million, increasing by 50.2% than 2004. The number of ADSL subscribers was 26.36 million, accounting for 70.3% in broadband users of basic telecom operators. The broadband access mode was proved to be the main Internet access mode.

3. Telecom network continued expanding and new technologies were applied and spread.

In 2005, the length of newly built optic fibre cable was 554,000 km, and the total optic fibre cable length reached 4,072,000 km. The length of new optic fibre core was 9,547,000 km, and the total length was 75,966,000. The increment of fixed toll call switch capacity was 1,086,000 channels, and the total number reached 13,716,000 channels. The increment of local switch capacity was 48,493,000 sets, and the total number reached 471,961,000 sets, where the capacity increment of receiving network equipment was 38,308,000 sets, and the total number reached 211,207,000 sets. The capacity increment of mobile phone switch was 85,574,000 sets, and the total number was

482,417,000 sets. The installation rates of fixed line and mobile phone were 76.4% and 81.4%. The number of new Internet broadband access ends was 12,966,000, and the total number hit 48,747,000. The Internet international outlet broadband was 136,106M. The total number of websites was 694,000, and the total number of domain names was 2,592,000.

As the network enlarged, telecom technologies were also widely used. The application of soft switch technology permeated from long-distance field to local field, and the existing network was transiting to NGN smoothly. Some central cities have launched EDGE-based commercial network and services and started CDMA1XEV-DO experiments. In some activities, mobile multimedia applications, such video stream and VOD, were demonstrated to the public. The fundamental transfer network was further improved, and ASON was deployed and tested in the existing network. The operation support system was also optimized, service support and network operation capacities were enhanced, and network quality was brought to another level.

4. The investment scale kept stable and industrial profit was gradually promoted.

The fixed asset investment in telecom industry was 209.78 billion yuan in 2005, decreasing by 4.6% than 2004. The fixed asset investment has been over 200 billion yuan for consecutive six years. Large-scale construction investment phase for the existing network almost ended, operators upgraded and optimized the network according to user development. The prediction of 3G made by operators had an effect on the investment. At the same time, operators had poor initiative performance and lacked new investment fields. Moreover, the capital market stressed the return. Therefore, telecom operators were prudent in investment.

As the investment decreased, the profit margin of the entire industry rose up. The total profit of the six major fundamental telecom operators was 126.51 billion yuan, increasing by 31.5% than 2004, and this growth rate was higher than the revenue growth rate. Confronted with the pressures from both competition and capital market, telecom operators realized the significance of profit priority. They optimized cost structures, carried out unified procurement, developed potentials inside enterprises, reasonably distributed resources, effectively controlled service cost, and gradually promoted their profit margins.

5. Achievements have been made for the Phone to Village Project, and rural areas were

further informatized.

Great achievements have been made for the Phone to Village Project in 2005. Phones were connected to 45,913 administrative villages in 2005. The proportion of administrative villages with telecom network covered reached 97.1%, increasing by nearly 6% than 2004. This achievement was higher than the objective specified in the Tenth Five-year Plan in terms of telecom network extension. The implementation of the Project has promoted telecom service quality, and improved communication infrastructure in rural areas.

While pushing up telecom infrastructure construction in rural areas, telecom operators took steps to develop information services that are suitable for the market, science and technology, culture, education, and entertainment in rural areas. Telecom operators endeavoured to provide information services and promoted informatization in rural areas, and contributed to rural economic development and farmers' living condition.

6. Telecom service quality was largely improved.

In 2005, telecom services were further spread in China. The phone coverage rate reached 57.3 phones per 100 people, increasing by 7.3% than 2004. The fixed line coverage rate was 27.3 phones per 100 people, and the mobile phone coverage rate was 30 phones per 100 people, increasing by 4.4%. The coverage rate of the Internet was 8.6%, increasing by 1.3%.

More and more telecom services have been launched for users to choose. New services, such as mobile cartoon, mobile chat, voice short message, and PHS short message are satisfying various consumers. Customized services oriented to various industries and enterprises at all levels boosted informatization in industries and enterprises. Market competition urged telecom charges to get down, which benefited for the public.

A telecom service quality system integrated with government regulation, self-discipline of enterprises, and public supervision, took its shape. Complaint hotlines for service quality and periodical announcement of service quality of enterprises have improved telecom service quality. Frequently complained issues have been solved, and telecom users were further satisfied.

(II) Operation of Chinese fundamental telecom enterprises in 2005

1. China Telecommunications Corporation

In 2005, the revenue of major services of China Telecom was 169.3 billion yuan, increasing by 6.4%. The subscriber number increment was 24.89 million, and the total number reached 214 million. The broadband user number increment was 7.68 million, and the total number reached 21,948,000. The proportion of non-voice service income in the revenue of major services was 23.7%.

By the end of 2005, China Telecom connected 17,266 administrative villages to the phone network, 7,026 villages more than the designated goal, which was almost 1.7 times of the total number specified in the Phone to Village Project during the Tenth Five-year Plan.

2. China Network Communications Group Corporation

In 2005, the revenue of China Netcom was 94.95 billion yuan, and the profit was 10.28 billion yuan. The fixed line subscriber number increment was 3.32 million, and the total number reached 91 million. The PHS subscriber number increment was 6.16 million, and the total number reached 28.83 million. The broadband user number increment was 3.41 million, and the total number reached 12.05 million.

In January 2005, China Netcom formally subscribed 20% equities of PCCW after its additional stock issue, and became its second largest shareholder. In the second half of 2005, China Netcom established strategic cooperative relations with Spanish Telecom, which held 5% shares of listed companies of China Netcom. The proportion will increase from 5% to 9.9%.

China Netcom finished investment and acquirement of Shanxi, Heilongjiang, Jilin and Inner Mongolian subsidies in October 2005, and the main operation body of China Netcom was listed successfully.

By the end of 2005, China Netcom covered 4,576 administrative villages into the telecom network, which was 145% of the task of Phone to Village Project specified by the state.

3 China Mobile Communications Corporation

In 2005, the revenue of major services of China Mobile was 235.8 billion yuan, increasing by 18.9% than 2004. The total profit was 79.2 billion yuan, increasing by 23% than 2004. The

subscriber increment remained at a high level. The subscriber number increment was 43 million, and the total number reached 264 million.

China Mobile energetically pushed up the Phone to Village Project, and covered 26,631 villages, 34% higher than the assigned task.

The rank of China Mobile went up to the 36th place among world companies in terms of market value issued by the Business Weekly, and China Mobile became a telecom operator with the largest market value in Asia. The market value of China Mobile was also among the top in the world.

4. China United Telecommunications Corporation

In 2005, the mobile subscriber number increment was 15,962,000, and the total number reached 129 million. The GSM subscriber number increment was 10.81 million, and the total number reached 95,879,000. The CDMA subscriber number increment was 5,152,000, and the total number reached 33,465,000. The revenue of major services stably grew. The revenue of major services hit 77.7 billion yuan in 2005, increasing by 7% than 2004. The profit exceeded 4.08 billion yuan.

International roaming services of GSM network provided by China Unicom have been connected to 248 operators from 118 countries and regions, and international roaming services of CDMA network have been connected to 18 operators from 15 countries and regions.

China Unicom brought phones to 4,631 administrative villages in 10 provinces and autonomous regions, which was 557 higher than the number assigned in the Phone to Village Project.

China Unicom was granted CDMA licence of Macao SAR, and established China Unicom (Macao) Co., Ltd.

5. China Satellite Communications Corporation

The revenue of major services of China Satcom increased by 14.3% in 2005. The company pushed the market of communication satellite transponder rent service, and the service revenue increased by 16.5%. Economic profit of satellite transponder was largely boosted up. The company also improved the IP communication network, and the number of cities covered by this service increased to 206. Operation performance transition occurred in terms of satellite mobile

communication and geographical information service for the first time. New economic growth points, based on NGN voice service, services provided by China Satcom Guomai Communications Co., Ltd, and satellite navigation and positioning service, largely pushed up the company's operation.

China Satcom signed a development financial cooperation agreement of 15 billion yuan with the National Development Bank.

6. China TieTong Telecommunications Corporation

In 2005, China Tietong followed the operation principle of characteristic profit-oriented development, further divided the market, strengthened regional operation system, customer manager system and entire-process marketing control system of the marketing organization management system, promoted marketing management quality, and realized simultaneous rapid growth of both scale and profit.

In 2005, the total telecom service amount of China Tietong was 16.95 billion yuan, increasing by 37.6% than 2004. The sales revenue was 13.7 billion yuan, increasing by 28.6%. The fixed asset investment was 8.7 billion yuan. The number of fixed line subscribers increased to 16,206,000, and the number of the Internet users hit 2,473,000, increasing of 1,059,000.

The company made a new attempt in capital operation, issuing ten-year fixed interest rate bond of one billion yuan for the first time in China.

(III) Post service development

In 2005, the total amount of post industry was 62.55 billion yuan, increasing by 10.8%. The total revenue of post services was 57.72 billion yuan, increasing by 8.1% than 2004. The revenue of delivery service was almost the same with last year. Post financial service revenue increased by 16.7%, and philately service revenue decreased by 20%.

1. Post service continued growing in a healthy way.

In 2005, the number of letters was 7.35 billion, and the revenue from letter post service was 5.03 billion yuan. The number of packages was 95,318,000, and the revenue was 2.28 billion yuan. The number of newspaper orders was 15.03 billion, and magazines one billion. The sales amount of

philately stamps was 1.21 billion, and philately brochures 29,408,000.

The express service sector, under furious competition pressure, consolidated network advantage and achieved a high growth rate. The service amount was 230 pieces in 2005, increasing by 15.7%, and the sales revenue was 6.58 billion yuan, increasing by 19.4%.

The logistic sector system was improved based on the unified and efficient logistic network, and the market share was also increased. The sales revenue of logistic sector was 1.95 billion yuan, increasing by 1.5%.

The balance of post saving was 1,359.87 billion yuan at the end of 2005, increasing by 26.1% on a y-o-y basis. The saving revenue was 28.21 billion yuan, increasing by 14.4%.

International services continued growing. The total sales revenue of international postal services was 3.37 billion yuan, increasing by 17.3%. The total number of international packages, including Hong Kong, Macao, and Taiwan, was 1,567,000, increasing by 5.2%. The total number of international express pieces was 6,988,000, increasing by 28.7%. The total number of international bills of exchange was 178,000, increasing by 68.4%.

In 2005, the agency service revenue of China Post was 840 million yuan, including 760 million yuan for providing telecom services. China Post issued 8,003,000 numbers for telecom operators and sold 81,822,000 cards for telecom operators. The proportion of long-term service revenue, such as charging as an agent, went up, and the agency telecom service structure was optimized.

The post ticket service continued growing fast. In 2005, the sales revenue was 62.65 million yuan, including 4.52 million yuan of 175,000 airline tickets, 45.52 million yuan of 3.29 million railway passenger tickets, 6.37 million yuan of 300,000 performance tickets, 3.45 million yuan of 28.75 million lottery tickets, and 1.43 million yuan of 880,000 vehicle and steamer tickets. Jiangsu Provincial Post Bureau was responsible for selling tickets for the Tenth National Games, and was awarded E-commerce Example of the Ministry of Commerce.

In 2005, the information service revenue was 19.72 million yuan, increasing by 13.99% than 2004, including 12.39 million yuan of post short message service. The post payment gateway deal was 996 million yuan.

2. Fixed asset investment structure was regulated, and communication network and capacity

was improved.

In 2005, China Post expedited capacity building in agency and information services. It launched nationwide post payment gateway service, which supported online payment of e-commerce, established the national post short message access platform, added 19 post short message services such as remit return service and EMS sent information service, and set up a post electronic service platform that uses business counter and electronic information (11185, 183 website and short message) as access mode and provides the public with all-round services (including telecom service, ticket service, receiving of public utilities fee, governmental administrative transactions, information service, and value-added service).

China Post has nine special post transporters, five post boats, 406 post train compartments, and 50,000 post vehicles (including 12,000 post transport vehicles). China Post has 107 post letter classification machines, 103 letter sorting machines, 616 business letter production systems, 130 presswork and package classification machines, 67 newspaper and magazine distribution lines, 7,175 ATMs, and 9,932 post charge devices.

3. Service conditions and quality were improved.

In 2005, there were 66,000 post offices and agents all over the country, including 47,000 offices located in rural area. There were 24,000 informatized offices, 47,000 post newspaper, magazine, and book booths, 17,000 philately booths, and 35,000 post saving offices. There were 21,000 post routes, including 1,651 air post routes, 108 first-level railway post routes, and 162 first-level road post routes. There were 367,000 post box groups, 202,000 post boxes, and 37,529,000 post delivery points. The number of counties (townships) where post saving service was available was 21,000, and the number of cities where 11185 customer service centre was available was 298. The number of letter per capita was 6, and the number of newspaper and magazine volumes every 100 people was 11. Each post office or service berth covered 20,000 people averagely.

III. Electronic information industry development

1. Major economic objectives for the industry accomplished

In 2005, the sales revenue of electronic information industry was 3,841.7 billion yuan, increasing by 24.8% than 2004. The revenue of software and system integration was 390.6 billion yuan, increasing by 40.5% than 2004. The industrial added value was 901.1 billion yuan, increasing by 28.4% than 2004. The profit and tax was 196.4 billion yuan, increasing by 15.3% than 2004. The export and import amount was US$488.7B, increasing by 25.8% than 2004. The product structure was adjusted. The outputs of computers, mobile phones, and colour TV sets were at the first place in the world, and the new-generation video-audio products, communication and network devices, and new displays became new economic growth points. The large-enterprise strategy was proved to be successful. There were 22 enterprises with the sales revenue over 10 billion yuan, and there were two enterprises with the sales revenue over 100 billion yuan. The building of national electronic information production bases and parks was stably pushed up, and industrial aggregation effect became obvious. The proportion of sales revenue, industrial added value, total profit, and employment population in the Pearl River Delta, Yangtze River Delta and Bohai Rim was over 70% in the total industry.

Table 1 Production of major electronic information products in 2005

Product	Unit	Output	Increase compared with 2004 （%）
Mobile phones	10,000 sets	30354.0	30.0
Programme control switches	10,000 lines	7720.9	1.3
Mobile base stations	10,000 channels	724.5	64.9
Colour TV sets	10,000 sets	8283.2	11.5
Microcomputers	10,000 sets	8083.8	35.3
Servers	10,000 sets	318.0	88.9

Displays	10,000 sets	16057.6	58.2
IC	100M blocks	265.8	12.9

2. The industrial development growth was stable, and the profit increased from a low to a high point

The electronic information industry continued stable growth in 2005 based on high-speed development in 2004, and the growth rate in every month was over 20%. The industrial added value accounted for 13.6% among all industries. The growth rate was 12% larger than the average level in China. The contribution rate of this industry to all industries was 20.8%.

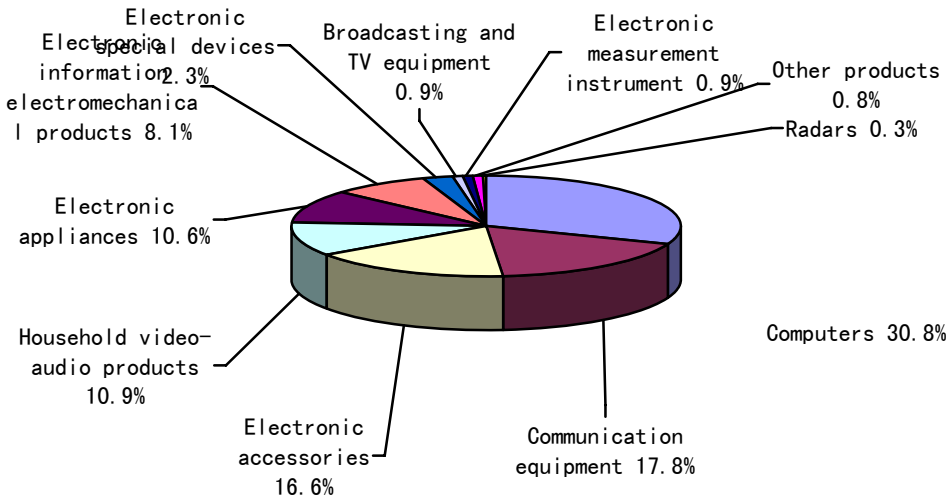
The industry displayed a stable growth from the perspective of development speed. In the first three quarters, the sales revenue and industrial added value of electronic information industry increased by around 21%. In the fourth quarter, the growth rates of the sales revenue and industrial added value were over 24%, increasing by over 3% than the first three quarters. As raw material cost rose, some industries stepped to periodical depression, and enterprises deal with surplus stock, the profit of the industry presented a negative growth since the second quarter. The profit of communication device sector and electronic accessory sector dropped fast. When the market recovered and company stock reduced in the third quarter, the profit of the whole industry started to climb up. Negative growth was overturned in October.

3. Structural adjustment expedited and the proportion of high-end products increased.

In 2005, the growth rates of computer sector and electronic accessory sector were higher than the average growth rate of the whole industry, and the two sectors drove the whole industry. The sales revenue of enterprises above the designated size in the industry was 1,512.3 billion yuan, increasing by 29% than 2004 and 4% higher than the industrial average. The profit was 48.2 billion yuan, increasing by 21% than 2004 and 7.6% higher than the industrial average. As enterprises speeded up new product development and market development, the product structure was gradually upgraded, and the proportion of high-end products constantly increased. LCD and

plasma products became economic growth points in colour TV set sector. The growth rates of LCD and plasma products were over 200%. In the computer sector, laptops accounted for nearly 60% in microcomputers, increasing by 5% than 2004.

Table 2 Sector proportions of electronic information manufacturing in 2005



4. Output increased to highest records and industrial internationalization was increasingly strengthened.

In 2005, the output of Chinese electronic information products kept growing at a high speed. The export and import amount was US$488.73B, increasing by 25.8% than 2004 and accounting for 34.4% in the total international trade amount in China.

In 2005, the export amount of Chinese electronic information products was US$268.17B, increasing by 29.2% than 2004, accounting for 35.2% in the total export amount in China, and contributing 36% to national export increase. The total import amount was US$220.56B, increasing by 21.9% than 2004.

The internationalization of Chinese electronic information industry was quickened in 2005. Multinational companies strengthened their Chinese strategies global resource integration. More and more multinational companies' subsidiaries in China became solely foreign capital funded companies, and multinational companies set up more and more regional headquarters and R&D centres. The position of foreign-invested companies rose up in electronic information industry.

The sales revenue of foreign-invested companies was 2,402.1 billion yuan, industrial added value 502.6 billion yuan, 82.2 billion yuan, and export US$234.1M, accounting for 77%, 77%, 77% and 87 in the industries above statistical threshold respectively. These proportions were higher than the ones of last year. At the same time, Chinese enterprises also tried to go global, enlarging themselves through multinational M&A in order to reinforce international competitiveness.

5. Enterprises' size was enlarged and industrial aggregation effect became obvious.

The taking of the 20th top 100 electronic information manufacturers was 964.3 billion yuan, increasing by 18.2% than the taking of the 19th top 100 ones and accounting for 25.1% in the total amount in the industry. The profit of these manufacturers was 24.8 billion yuan, accounting for 19% in the total amount in the industry. The tax was 28.9 billion yuan, increasing by 7% than the tax of the 19th top 100 ones. The proportion of top 100 companies in the total number of manufacturers was less than 2‰, and these top 100 companies brought 1/4 taking and 1/5 profit in the whole industry. Among the 20th top 100 electronic information manufacturers, 22 companies realized takings of over 10 billion yuan. The takings of Legend and Haier were over 100 billion yuan, which was close to the lowest standard of Fortune 500 enterprises.

Among the 20th top 100 electronic information manufacturers, 16 companies were listed for the first time. Sixteen companies were excluded due to restructuring or low growth rate. This indicated a dynamic competition mechanism.

Over the past two decades, the development of the top 100 companies was characterized by the following points. Firstly, the entire scale constantly increased fast, and the dominant role was highlighted. The taking of the top 100 companies increased from 11.6 billion yuan of the first top 100 companies to 964.3 billion yuan of the 20th top 100 companies, increasing by over 64 times. The average annual growth rate reached 26.2%. These companies have become major manufacturers of main electronic products, and have formed regional industrial groups with these companies at the core. Secondly, the industrial structure became reasonable and the industrial chain was improved. Product structure was adjusted all the time, mainstream products were upgraded from time to time, the structure was optimized, and regional industrial structure was

further coordinated. The top 100 companies have become a dominant part that implemented regional grads transfer of electronic information industry. Thirdly, the investment in R&D increased year by year, and independent innovation ability was promoted remarkably. The top 100 companies invested more and more in R&D, made great achievements in core technologies, accumulated more and more independent intellectual property rights, and boosted the upgrade of technical structure and product structure. Fourthly, the top 100 companies quickened internationalization, and played an important role in international trade balance in Chinese electronic information industry. Product output structure was upgraded, international operation started to transfer from product output to capital and brand output. Some enterprises have owned world brands.

6. Industrial concentration was promoted and regional aggregation effect became distinct.

Eastern coastal area was still a main electronic information industrial base. The largest eight enterprises were located in the east. In the Yangtze River Delta, Pearl River Delta and Bohai Sea Rim, the proportion of labour force, sales revenue, industrial added value and profit was over 80% respectively, larger than the proportion of 2004. The building of industrial bases and parks was enhanced. The industrial size and total profit and tax of nine formally established national electronic information industrial bases accounted for over 3/4 in the whole industry. Industrial aggregation effect and advantageous position of bases became more evident.

7. Software sector development

In 2005, the sales revenue of Chinese software industry was 390.6 billion yuan, increasing by 40.5% than 2004. The sales revenue of software products was 193.15 billion yuan, increasing by 26.4% than 2004 and accounting for 49.5% in the total income of software industry. The revenue of system integration was 105.9 billion yuan, increasing by 84.7% than 2004. The revenue of software service was 91.55 billion yuan, increasing by 201.9% than 2004. The software export amount was US$3.59B, increasing by 28.2%. Beijing, Guangdong, Shanghai and Jiangsu remained key areas of Chinese software industry. Beijing held the largest size, and the revenue

was 91.4 billion yuan, increasing by 42% than 2004. Jiangsu had the largest growth rate, and the revenue was 41.6 billion yuan, increasing by 98.9% than 2004. Software bases developed fast, including 11 national software industrial bases and six national software export bases. In terms of sales revenue, software companies in the bases accounted for 3/4 in all software companies in China. Software companies continued enlarging size and strengthening competitiveness. Among the largest 100 software companies in 2004, 21 companies had the sales revenue of over one billion yuan. In 2005, another five companies realized sales revenue of over one billion yuan. At the same time, the sales income of the top 100 software companies appraised in 2004 was over 100 billion yuan in 2005, increasing by 16.4% than 2004. The export amount was US$1.59B, accounting for 45% in the total export amount in the software sector.

Table 2 Software industry income composition (%) from 2004 to 2005

	2004	2005	Proportion change
Software product income	63.5	49.5	-14.0
System integration income	23.9	27.1	3.2
Software service income	12.6	23.4	10.8

IV. Industrial management in Chinese information industry

1. Structural reform and the work of laws and regulations were improved.

Policy research was carried out with regard to telecom market competition structure and capacity building of telecom monitoring and regulation according to the requirement of the State Council on deepening the telecom system reform. Enterprises were guided to strengthen internal reform and establish and improve the modern enterprise system. Post system reform was stably boosted. The Administrative Licence Law and the Implementation Guidelines on Carrying through

Administration According to Law were implemented to impel governmental function transfer and administration according to law. The legislation on Telecom Law was promoted, and the draft has been rendered to relevant departments of the State Council. Judicial interpretation of inter-link and inter-connect was made. The Electronic Signature Law has been put into force. The Post Law and Wireless Management Regulations were being revised. Legal system in electronic information industry was improved, and the legislation on software and system integration was speeded up. The Eleventh Five-year Plan of the information industry has been formulated. Communication and cooperation in information industry across the straits was promoted, and the technical standard forum of information industry across the straits was successfully held. CEPA agreement was further carried through.

2. Market regulation, public management and public service were promoted.

Telecom regulatory departments carried through the circular on enhancing monitoring and management over telecom market of the State Council and requirements of the Ministry of Information Industry, and achievements have been made in rectifying and normalizing the market order. The guide on market access was reinforced to drive competition and prosperity in the market. System building was enhanced, inter-network settlement relation was adjusted, and monitoring systems were established, so the general situation of convergence turned better. The essence of the documents on strengthening telecom charge management issued by the State Council and the National Development and Reform Commission was carried through to advance the reform of telecom charge management mode, as a result of which, the market price competition order turned better. The access system of telecom equipment was standardized and inspection management was improved. The management on telecom piping and local network was improved, and the competition of communication building market was standardized. Telecom charging systems were tested in the industry. Frequently complained problems on service quality have been solved, and customers' rights and interests were safeguarded. Service quality was improved and communication in rural areas was advanced. Emergency communication was also enhanced. Radio frequency planning, monitoring and station management, and technical facility

building were stably boosted, and partial achievements were made in rectifying civil aviation frequencies. The management on key products, such as satellite, broadcasting and TV receivers, and tax-control gathering device, was intensified, and anti-pollution work of electronic information products was branched out. Achievements were made in operation alarm and monitoring of industrial economy.

3. Independent innovation was stressed and standard research and formulation was reinforced.

The Eleventh Five-year Plan and Medium and Long-term Plan for 2020 of Technological Development in Information Industry (Outlines) were completed in 2005. Macro control and guide on technological development in information industry was enhanced, and the guide of technological development policies and product development project in information industry was made.

Technical innovation and reforms on systems and mechanisms shall be pushed through exerting the dominant role of the government, the basic role of the market in technical resource distribution, the principal role of enterprises in technical innovation, the pioneering role of national scientific research institutes, and fundamental and supporting role of universities and colleges, in order to combine various technical innovation powers. Relevant industrial policies have been implemented, and the management rules on IC special R&D fund were made to create a favourable environment for software and IC industry. Great achievements have been made in the Starlight China Chip Project, and the IC design level reached 0.13 microns. R&D and industrialization of CUP, Chinese language Linux, 3G technology, trunking communication, and digital TV was largely promoted. A number of technologies and products with independent intellectual property emerged. The gap between Chinese level and international advanced level was reduced.

Standardization work was pushed up and enterprises energetically took part in international competition. Enterprises were directed to formulate standards in an open mode in order to quicken the formulation of standards of network convergence, service quality, 3G, and digital trunking communication. Research and formulation of independent standards were supported. Enterprises

shall energetically participate in international standardization activities to raise Chinese status and role in international standard formulation.

4. Informatization was further improved.

Key informatization projects, including Gold Card Project, Gold Tax Project, and custom electronic law enforcement system, were energetically advanced. Digital gas long-distance monitoring and control system was spread in coal mine safety production field. The effect of enterprise informatization was obvious, and CAD/CAM was popularized in key national enterprises. IC card application, such as 2-G ID card, was disseminated under the support of relevant departments. Electronic administration, e-commerce, city informatization and agricultural informatization were promoted, information resource development and utilization was spread, and more and more online services for the public were launched. Basic work, such as electronic certification service management and informatization training, was smoothly carried out. Pilot extension projects of modern long-distance education for rural cadres were implemented under the support of concerning departments.

5. International cooperation and exchanges

International cooperation and exchanges were promoted, and Chinese enterprises made achievements in developing international market. International economic and technological cooperation and exchange was carried out in more fields and channels deeply. Powerful Chinese enterprises were encouraged to develop international market. Progresses were made in overseas M&A and overseas establishment of factories and R&D institutions. Useful experience was accumulated.

Vice Premier Huang Ju of the State Council attended the Tunis Stage Conference of Information Society World Summit in 2005, and leaders of the Ministry of Information Industry, followed by a delegation, attended APEC Telecom Ministers Conference, establishing bilateral and multilateral communication and cooperation platforms and boosting information industry cooperation between China and the US, Russia, Japan, Korea and Europe. China-ASEAN telecom week activity was

held, and substantial progresses have been made in key projects, such as Great Mekong Sub-region Information Highway. China also supported Hong Kong SAR to prepare for ITU Telecom World 2006.

V. Development objectives of Chinese information industry in 2006

Macro development objective of Chinese information industry in 2006 was that the added value would reach 1,570 billion yuan, including 470 billion yuan in communication sector, 1,100 billion yuan in electronic information sector, 1,500 billion yuan of total communication service amount (increasing by 24%), and 700 billion yuan of communication service revenue (increasing by 10% or so). The number of new fixed line users will be 30 million, and the number of new mobile subscribers will be 480 million. Fixed main line popularization rate will reach 29% and mobile phone popularization rate will reach 34%. Fixed asset investment will be about 200 billion yuan. The sales revenue of electronic information industry will be 4,660 billion yuan, increasing by 21.3%. The sales revenue of software and system integration will be 500 billion yuan, increasing by 28.2%. The total profit and tax will be 185 billion yuan, increasing by 6.2%. Export amount will increase by 15%.

VI. Chinese information industry development during the Tenth Five-year Plan (2001-2005) period

Since of start of the Tenth Five-year Plan period, information industry departments in China implemented policies and guidelines of the state, and worked hard in expediting industrial development, deepening system reform, promoting independent innovation capacity, developing communication facilities in rural areas, strengthening market control, boosting informatization, and guaranteeing network and information security. Development objectives of the Tenth Five-year Plan have been achieved with flying colours, and information industry contributed a lot to Chinese social and economic development. During the Tenth Five-year Plan period, the growth rates of Chinese communication service amount and sales revenue were 27.6% and 13.4%. The average annual number of new phone users was 100 million. The number of fixed line users and

the number of mobile phone subscribers jumped to the first place in the world, and the number of netizens was at the second place. In the five years, the fixed asset investment was 1,000 billion yuan, and the raised fund of telecom enterprises listed in overseas markets was US$25.25B. The average annual growth rate of sales revenue of enterprises above the designated size was 27.3%, the industrial size expanded by 2.3 times within five years, and the average annual growth rate of total profit and tax was 12.4%. Meantime, the average growth rate of software sector was over 40%, and the size increased by four times. The proportion of software sector in the whole electronic information industry increased from 6.3% in 2001 to 11.2% in 2005. The average annual export growth rate of electronic information products was as high as 35.3%, and the total absorbed foreign investment was US$100B. During this period, the state promulgated 368 national standards and 647 industrial standards, and the total number of patent applications was 228,000. The state carried out 2,545 projects of Multiple Plan in information technology dissemination and application, and the investment amount was 62.57 billion yuan.

Over the past five years, great successes have been made in some fields. The competitive pattern in the telecom market took its shape, and telecom regulation systems at provincial and ministry levels have been established. Achievements have been made in the Phone to Village Project, and 97.1% of administrative villages in the country were covered with phone network. Telecom charge marketization reform was substantially improved, and consumers benefited from the reform. 3G technology R&D and industrialization and network technology experiment were strengthened, laying a solid foundation for future development. The state has issued industrial policies and independent innovation capacity was promoted. Export of electronic information products increased fast, accounting for over 1/3 in the total export amount in China. Chinese enterprise endeavoured to develop international market and brought their international competitiveness to another level.

VII. Chinese information industry development objectives during the Eleventh Five-year Plan period (2006-2010)

Major objectives of Chinese information industry development objectives during the Eleventh

Five-year Plan period are as follows. By 2010, the information industrial added value is 2,260 billion yuan, accounting for 10% in the GDP, including 1,600 billion yuan of electronic information sector, 604 billion yuan of telecom sector, and 56 billion yuan of post sector. The sales revenue of electronic information sector will reach 7,000 billion yuan, including 1,000 billion yuan of software and system integration. The proportion of electronic product export in the total export amount in the state remains at about 35%. The sales revenue of telecom sector will be 915 billion yuan, increasing by 10% on a y-o-y basis. The sales revenue of post service will be 82 billion yuan, increasing by 8% on a y-o-y basis. The total number of phone users reach one billion, and the number of netizens reach 200 million. Phone service and Internet service will be available to every village and every country. At the same time, innovation capacity, competitiveness and coordinated development will be boosted.

During the Eleventh Five-year Plan period, main tasks of developing the information industry consist of maintaining the healthy, fast and orderly development trend in the whole industry, promoting Chinese position in global industrial pattern, boosting technical innovation system building with enterprises as the main body, combining introducing and going global, driving international cooperation in a wider field and in a deeper level, improving industrial management and market regulation system, enhancing legal system building, establishing an industrial policy system that benefits the industry, improving communication service quality, strengthening the application of information technologies, and pushing up informatization building.

Chapter II Development outlines of Chinese electronic information industry in 2006

I. Overview

The year of 2006 was the first year of the Eleventh Five-year Plan period. Chinese information industry focused on restructuring, independent innovation and functional transfer. The industry developed in a rapid, balanced and healthy way. The start of the Eleventh Five-year Plan was favourable. Communication sector transfer witnessed positive effects. Electronic information industry maintained fast and stable development mode. Independent innovation capacity was

promoted. Industrial management and market regulation was further strengthened. Informatization work was deepened. Notable progresses were made in foreign communication and cooperation, governmental function transfer, administration according to law, and team building.

In 2006, the increment value of electronic information industry was 1,560 billion yuan, accounting for 7.5% in GDP. The increment of electronic information industry was 1,100 billion yuan, and communication industry 464.2 billion yuan. The sales revenue of electronic information industry was 4,750 billion yuan, and the export and import amount of electronic information products was US$651.7B, accounting for 37% in total Chinese foreign trade amount. The number of fixed line users in China was 368 million, and mobile phone subscribers 461 million. The total number of phone subscribers was 830 million. The communication network size and the number of subscribers remained at the first place in the world. The number of netizens reached 137 million and ranked at the second place.

II. Communication industry development

In 2006, the total communication service amount was 1,530 billion yuan, increasing by 25.6%. The amount for telecom sector was 1,460 billion yuan, increasing by 26.1%, and post sector 72.9 billion yuan, increasing by 16.9%. The sales revenue of communication services was 712.1 billion yuan, increasing by 11.6%. The sales revenue of telecom sector was 648.4 billion yuan, and post 63.7 billion yuan. The increment value of communication services was 464.2 billion yuan, and the fixed asset investment in communication services was 222.7 billion yuan.

(I) Telecom development

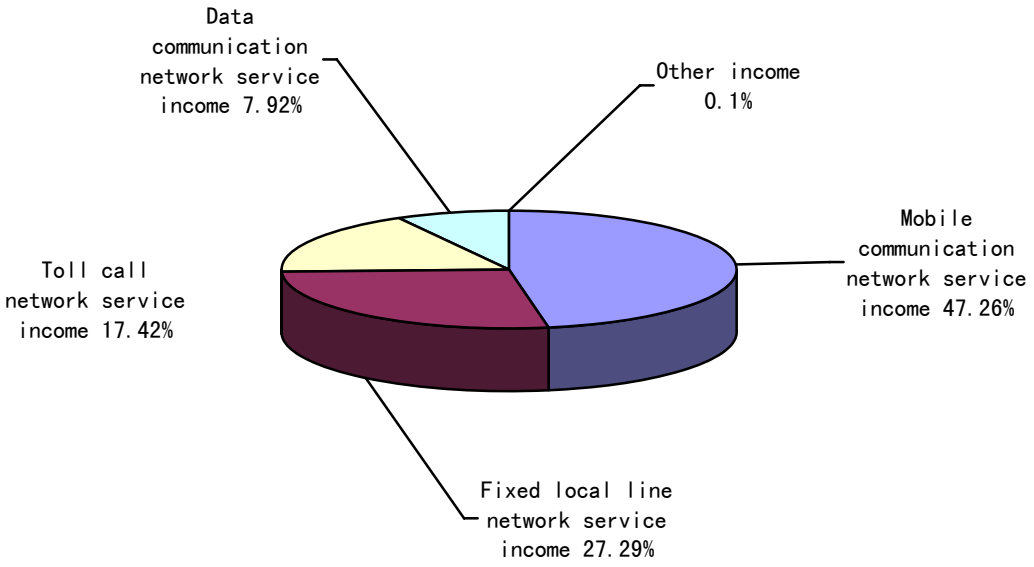
1. Telecom industry continued rapid development and speeded up industrial transfer.

In 2006, the total telecom service amount was 1,460 billion yuan, increasing by 26.1% than 2005. The income growth was stable in telecom industry. The service income in 2006 was 648.4 billion yuan, increasing by 11.7% than 2005, accounting for 3.1% in the total GDP. The added value of telecom sector was 383.1 billion yuan, accounting for 1.8 % in the total GDP.

In 2006, major telecom service amounts continued growing largely. The number of local calls and calls between local networks was 679.57 billion, decreasing by 3.6%. The calling time of fixed line domestic toll phone was 97.2 billion minutes, increasing by 8.8%. The calling time of mobile phone was 1686.7 billion minutes, increasing by 34.7%, where the calling time of mobile toll call was 97.8 billion minutes, increasing by 37%. The calling time of IP phone was 148.9 billion minutes, increasing by 10.7%. The number of mobile short messages was 429.7 billion, increasing by 41%.

Telecom operators innovated in technology, service and management, and expedited the transfer to an information service sector. Innovation in value added services was vivid, and the number of enterprises and the number of practitioners constantly increased. The growth rate of service sales revenue was dramatically higher than that of basic telecom service. In 2006, the revenue of non-voice service increased by 34.2%, and the proportion in the total service revenue increased from 22% in 2005 to 26% in 2006. In terms of fixed line services, the sales revenue of broadband access increased by 25% than 2005, accounting for over a half in the total revenue increment of fixed line services. Broadband service has become the most important drive of fixed line services. Value added service revenue of basic operators reached 100 billion yuan, increasing by over 40% than 2005, and value added service developed most rapidly. Mobile value added services contributed more than 25% to operators. Traditional SMS revenue remained a high growth rate. The growth rates of new value added services, such as CRBT and WAP, were almost 100%.

Figure 1. Telecom revenue structure of 2006



2. Telecom subscriber number continued growing and the transfer of voice serve to mobile mode became obvious.

In 2006, the total number of telecom subscribers continued growing. The total number of phone users in China reached 800 million, and the number of mobile users reached 400 million. The number of new phone users was 85.04 million, and the total number reached 830 million. The number of new fixed line users was 17.37 million, and the total number hit 368 million. The number of new PHS users was 5.83 million, and the total number increased to 91.13 million. The number of new mobile users was 67.68 million, and the total number reached 461 million. The proportion of mobile voice service revenue went on rising. This proportion was 56.4% in 2006, increasing by nearly 3% tan 2005. The proportion of fixed line service revenue decreased from 46.2% in 2005 to 43.6% in 2006.

3. Telecom network size kept expanding and new technologies were widely used.

In 2006, the length of newly built optic fibre cable was 186,000 km, and the total optic fibre cable length reached 4,259,000 km. The length of new optic fibre core was 12,968,000 km, and the total length was 88,934,000. The increment of fixed toll call switch capacity was 769,000 channels, and

the total number reached 14,485,000 channels. The increment of local switch capacity was 30,665,000 sets, and the total number reached 502,626,000 sets, where the capacity increment of receiving network equipment was 23,414,000 sets, and the total number reached 234,622,000 sets. The capacity increment of mobile phone switch was 128,181,000 sets, and the total number was 610,599,000 sets. The number of new Internet broadband access ends among basic telecom operators was 16,067,000, and the total number hit 64,814,000.

As the network enlarged, telecom technologies were also widely used. NGN soft switch technology was commercialized in both long distance service and local service in all over the country, and IMS technology was being tested on schedule. Depending on IP dual networks, unified network platform, and other technological concepts and schemes, QoS and security problem of IP carrying network has been partially solved. ASON has been commercialized in inter-city field and provincial major field. Broadband access has been expedited through ADSL2+ and VDSL, and FTTx was also put into use in a small scale. Operation supporting technologies were also innovated. TD-SCDMA technology was being tested smoothly, and stage outcomes have been made to support 3G development in the future.

4. Investment amount started to rebound and investment return gradually increased

In 2006, fixed asset investment in telecom sector was 218.7 billion yuan, increasing by 7.5%. Fixed communication enterprises investment decreased by 6.3%, but mobile communication enterprise investment increased by 19.6%.

Telecom operators focused on different investment fields according to service and network development demand. Mobile communication operators concentrated on network expansion and auxiliary equipment optimization to meet the demand of drastic increment of users and voice service amount. The number of new 2M circuits of mobile toll call service was 252,000, and the number of new mobile phone switches was 128,181,000 sets, increasing largely than 2005. Fixed line communication operators focused on network access, and invested far less in PSTN and PHS network. In 2006, the number of new Internet broadband users was 16,067,000, while the number was 12,578,000 in 2005. The number of new 2M circuits of fixed toll call service was 26,000,

which was about 1/3 of the increment of 2005. The number of new local switches was 30,665 sets, which was about 2/3 of the increment of 2005. In addition, fixed line communication operators invested more in fixed network intelligentization alteration, introduction of soft switch devices, and IP inter-city network optimization to facilitate the transfer.

The investment return of the whole industry rose year by year. The ROI decreased from 41.2% in 2004 and 35.1% in 2005 to 33.7% in 2006. The total profit of six basic telecom operators was 134.7 billion yuan, increasing by 16.3% than 2005, which was higher than the income growth rate.

5. Informatization work was boosted in rural areas to support countryside building.

The Phone to Village Project was continued in 2006, and the informatization was promoted in rural areas. The number of administrative villages that were just connected to the phone network in 2006 was 13,740, and was higher than the objective designed in early 2006. The proportion of administrative villages covered by phone network increased from 97.1% in 2005 to 98.9% in 2006. In 24 provinces, autonomous regions and municipalities directly under the central government, all administrative villages have been covered with phone network. Telecom service quality has been promoted.

As the Phone to Village Project was carried out, telecom operators also established various information service platforms in rural areas to promote value added services and Internet services, and integrate technical, supply and demand, and educational resources in relation to new countryside construction based on service sub-branches and informatization workstations in rural areas. Telecom operators made use of fixed line phones, mobile phones, short messages, message devices, and broadband access to develop political, productive and market information in connection with agriculture, countryside and farmers, which promoted informatization in rural areas. In Jiangxi and Hubei provinces, broadband access was available to every county, and the number of agriculture-related websites was over 6,000. Telecom operators provided farmers with agriculture-related information and multiple information services, and contributed to new countryside construction.

6. Telecom service quality has been promoted and telecom charge reduced as a whole.

In 2006, telecom services were further spread in China. The phone coverage rate reached 63.4 phones per 100 people, increasing by 6.1% than 2005. The fixed line coverage rate was 28.1 phones per 100 people, increasing by 1.1%, and the mobile phone coverage rate was 35.3 phones per 100 people, increasing by 5%.

Basic telecom service market became more standard and orderly, network operation and convergence went smoothly, communication quality was stably raised, marketing flow was further improved, telecom service protocols were standardized, and customer satisfaction largely increased. Service quality of value added telecom services was dramatically promoted, management of information services was normalized, supervision and management system of information services was improved, customer complaints were solved, the number of complaints on charge and SMS was reduced, protective measures for users' rights and interests were specified and implemented, the service quality of value added telecom market was rapidly promoted.

In 2006, Chinese general telecom charge reduced by 11.3% than that at the end of 2005. Unbalanced telecom charging standard in different places was changed. Mobile phone charges in high-level charging standard areas, including Beijing and Shanghai, remarkably dropped. Competent authorities carried through more flexible charging standards in rural areas and issued policies on reducing inter-region telecom charge. Telecom operators have provided various charging packages that were suitable for local practice in rural areas.

7. The Internet scale expanded stably and network capacity constantly rose.

The number of Chinese netizens was 137 million in 2006, and the Internet popularization rate was 10.5%. The number of broadband users was 90.7 million, with the annual growth rate of 41.1%. Broadband netizens accounted for 65.7% in the total netizens. The number of mobile online service users was 17 million, which came to a certain scale. China had 4.1 million domain names, and the number of state CN domain names hit 1.8 million, jumping to the fourth place in the list of global state top-level domain name. China had 4.47 web pages, 122TB page bytes, 843,000

websites, and 98,016,000 IP addresses.

Chinese Internet trunk units were scaled up, network structure became flat, network coverage rate increased, optic fibre extended to user locations, and network capacity was promoted. In 2006, the total amount of international outlet broadband was 256.7G, and the number of ISPs was over 13,000. Chinese electronic administration, enterprise information and e-commerce have been advanced. Notable progresses have been made in rural information household building. Over 96% counties and towns could access to the Internet.

(II) Operation of Chinese fundamental telecom enterprises in 2006

1. China Telecommunications Corporation

In 2006, the revenue of major services of China Telecom was 173.2 billion yuan, increasing by 5.3%. The subscriber number increment was 14 million, and the total number reached 228 million. The broadband user number increment was 8.05 million, and the total number reached 30 million, increasing by 36.7%. The proportion of non-voice service income in the revenue of major services was 29.7%.

China Telecom determined the operation strategy of deepening service transfer and implementing customer brand. The company launched Biz Navigator and One Home brands, and succeeded in comprehensive information services, including Best Tone service and enterprise informatization applications.

The first six provincial industrial companies under China Telecom were listed in HKSE on December 8, 2006, and the raised fund was HK$3.26B.

China Telecom was specified as the communication partner of World EXPO Shanghai 2010 in 2006.

2. China Network Communications Group Corporation

In 2006, the service revenue of China Netcom was 96.9 billion yuan, and the profit was 9.6 billion yuan. The fixed line subscriber number increment was 1.57 million, and the total number reached

121 million. The PHS subscriber number increment was 760,000, and the total number reached 29.59 million. The broadband user number increment was 4.34 million, and the total number reached 16.39 million.

China Netcom boosted system innovation, operation innovation, technological innovation and service innovation, and made substantial progress in innovation. The company actively carried out combination product market strategy, launched Affection 1+, Popular Call and Sun Master services, spread CNC Connected, CNC View, and 114 services, and opened the first all-video website CNCMAX in China.

3 China Mobile Communications Corporation

In 2006, the revenue of major services of China Mobile was 286.3 billion yuan, increasing by 21.4% than 2005. The total profit was 97.8 billion yuan, increasing by 23.5% than 2005. The subscriber increment remained at a high level. The subscriber number increment was 53 million, and the total number reached 317 million. China Mobile ranked at the first place in network scale and number of subscribers in the world, and its market value rose to the first place among all telecom operators in the world in 2006.

China Mobile continued its approach to a mobile information expert in 2006 through active product innovation and service marketing, and the revenue proportion of value added services continued going up. Nong Xin Tong, Weather Report, Xiao Xin Tong and e-Bank services have been widely spread.

China Mobile was specified as the communication partner of World EXPO Shanghai 2010 in 2006.

4. China United Telecommunications Corporation

In 2006, the mobile subscriber number increment was 14,890,000, and the total number reached 144 million. The total GSM subscriber number was 107 million, and the total CDMA subscriber number was 37,300,000. The revenue of major services stably grew. The revenue of major services hit 82.1 billion yuan in 2006, increasing by 5.7% than 2005. The profit exceeded 4.1

billion yuan.

China Unicom promoted brand marketing in 2006, focusing on Shijiefeng, U-power, Ruyitong and Xinshikong brands. The company succeeded in independent innovation. CDMA/GSM dual-network dual-standby terminal technology was awarded the first prize of technological progress by China Institute of Communications.

China Unicom won the bid of 3G licence in Macao in 2006, issued US$1B transferable bonds to Korean SK Telecom, and signed a strategic ally frame agreement with the company.

5. China Satellite Communications Corporation

In 2006, China Satcom promoted satellite communication broadcasting capacity. Zhongxing 6B and Zhongxing No. 9 satellite projects went smoothly, Beijing gateway station of satellite broadband service was completed, satellite communication broadcasting market was further developed, and more services were launched. Ground network communication service was promoted, and the key point of digital trunking service has changed to market development stage. The company actively carried out satellite navigation and positioning service and e-map geographical information service, and the high-end e-map database was available to over 200 cities in China, accounting for 75% in Chinese auto navigation market. The market share of personal mobile navigation based on mobile/PDA reached 50%.

6. China TieTong Telecommunications Corporation

In 2006, the total telecom service amount of China Tietong was 20.2 billion yuan, increasing by 18.9% than 2005. The sales revenue was 15.5 billion yuan, increasing by 13%. The fixed asset investment was 8.6 billion yuan, and the profit increased by 52% than 2005.

China Tietong implemented the development strategy of combining dedicated network with regionalization in 2006. The company made use of rail transport dedicated communication network, consolidated market share in relatively developed areas, and stepped up characteristic services with low investment, short return period and high added value.

(III) Post service development

In 2006, the total amount of post industry was 72.9 billion yuan, increasing by 16.9% than 2005. The total revenue of post services was 63.7 billion yuan, increasing by 10.5% than 2005.

1. Post service kept stable growth.

Letter service was further restructured and scaled up. The total number of letters was 7.13 billion, and the revenue of business letters increased by 22.3% than 2005. In 2006, the total number of ordered and sold newspapers and periodicals was 16.39 billion. Philately service continued developing in a healthy way. The sales amount of philately stamps was 1.05 billion, and philately brochures 26,899,000.

New modes have been created in agency and information services, and national SMS platform was used as a key to develop information value-added services and new e-commerce services. The revenue of agency and information services increased by 11.6% than 2005.

In 2006, the service amount was 270 pieces in 2005, increasing by 18% than 2005. The sales revenue of logistic service increased by 15.9% than last year, and the revenue of distribution and mail order service increased by 49.5% than last year.

The balance of post saving was 1,601.96 billion yuan at the end of 2006, increasing by 17.8% on a y-o-y basis. Current deposit balance accounted for 33.7% in the total saving balance. The saving revenue increased by 11.2% than 2005.

2. Post communication network capacity was promoted.

The post communication network was further integrated and optimized in 2006. China Post had 11 special post transporters, three post boats, 399 post train compartments, 54,000 post vehicles, and 21,000 post routes (including 1,040 air routes, 163 railway routes, and 15,000 road routes). The total length of post route (one-way route) was 3,369,000km. There were 98,000 post routes in rural areas and 50,000 post segment roads in urban areas.

3. Post service quality was promoted.

In 2006, there were 63,000 post offices and agents in all over the country, including 44,000 offices located in rural areas. There were 33,000 informatized offices, 44,000 post newspaper, magazine, and book booths, 15,000 philately booths, and 36,000 post saving offices. There were 533,000 post box groups, and 42,870,000 post delivery points.

III. Electronic information industry development

1. Major economic objectives for the industry accomplished

In 2006, the sales revenue of Chinese electronic information industry was 4,750 billion yuan, increasing by 23.6% than 2005. The revenue of software and system integration was 480.1 billion yuan, increasing by 22.9% than 2005. The industrial added value was 1,100 billion yuan, increasing by 22.1% than 2005. The profit and tax was 259.8 billion yuan, increasing by 32.3% than 2005. The export and import amount was US$651.7B, accounting for 37% of the total foreign trade amount of China. Comprehensive competitiveness of major enterprises was promoted. There were 10 enterprises with the sales revenue over 20 billion yuan, and there were two enterprises with the sales revenue over 100 billion yuan. Industrial restructuring was speeded up, software outsourcing service developed fast, IC design capability was improved, new economic growth points emerged, such as flat panel display, and communication products, computers, and new-generation electronic consumables drove the industry. The building of national electronic information production bases and parks was stably pushed up, and industrial aggregation and impulse effect became obvious.

Table 1 Production of major electronic information products in 2006

Product	Unit	Output	Increase compared with 2004 （%）
Mobile phones	10,000 sets	48,014	58.2

Programme control switches	10,000 lines	7,405	-4.1
Mobile base stations	10,000 channels	1,145	58.0
Colour TV sets	10,000 sets	8,375	1.1
Microcomputers	10,000 sets	9,336	15.5
IC	100M blocks	336	26.3
Digital cameras	10,000 sets	6,695	21.2

2. The industry grew rapidly and stably and operation quality was constantly improved.

In 2006, Chinese electronic information industry added value accounted for 5.25% in the GDP, increasing by 0.31% than 2005, and contributed over 7% to GDP growth. The added value accounted for more than 10% in Chinese industrial added value, and contributed over 15% to Chinese industrial added value. The average monthly growth rates of sales revenue and added value of electronic information enterprises at above designated size were over 24%, higher than that in 2005. The general development trend was stable, and the monthly growth rate fluctuation was within 3%. The manufacturing was in the leading position in the whole industry in China. The growth rate of average monthly added value was 8% higher than that of the whole industry in China. The production connected well to the sale. The ratios of production to sale of mobile phones, computers and colour TV sets were all over 98%. The proportion of high-end products went up. Laptops accounted for 63% in microcomputers, and flat panel TV sets accounted for 12% in colour TV sets, increasing by 3% and 4% than 2005 respectively.

3. Restructuring was deepened and communication and accessory sector developed rapidly.

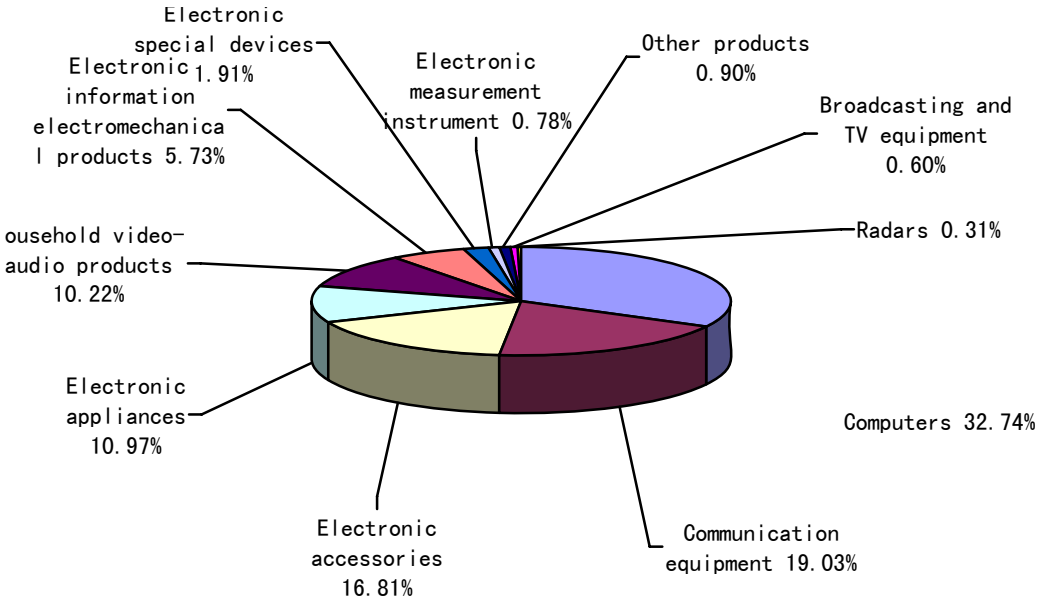
Information technology updated faster, industrial structure was increasingly upgraded, and communication equipment and accessory sector developed rapidly. Thanks to entire-machine transfer and upgrade, the market demand of new-type parts and accessories was enormously driven. The production and profit growth rates of accessory sector were over 25% in 2006, and IC sector went to a new rapid development phase. Telecom operation networks were upgraded, and

the state invested more in telecom facilities in rural areas. As a result, telecom equipment sector developed fast, and the growth rates of sales revenue and profit were as high as over 30%, which was higher than the average level of the whole industry. Due to technological upgrade, household electric appliance sector developed relatively slowly, and the growth rate of revenue and profit was largely lower than the average level of the whole industry.

4. Foreign trade hit high volume and industrial internationalization was advanced.

In 2006, the export and import amount of Chinese electronic information industry was US$651.7B, accounting for 37% in total Chinese foreign trade amount. The export amount was US$364B with the growth rate of 35.7%, accounting for 37.6% in total Chinese export amount. The import amount was US$287.7B, increasing by 30.5% and accounting for 36.3% in total Chinese import amount. China accounted for over 15% in global electronic information product export and import amount. Many products were at the top in the world, mobile phone accounting for 47%, including computer accounting for 40%, and colour TV set accounting for 48%.

Figure 2 Proportions of electronic products in the whole industry (%)



Chinese electronic information industry internationalization was increasingly advanced in 2006. The sales revenue, industrial added value and profit of foreign-invested enterprises accounted for

79%, 79% and 76% among manufacturers above the designated size. Processing export made it possible for foreign-invested companies to expand. The export amount of these enterprises accounted for over 4/5 in the whole industry, so the foreign trade dependency of the whole industry hit over 50%. Multinational companies invested more in China, and localization and R&D transfer trend became evident. Upstream and downstream industries pushed each other and started to transfer to China. Local enterprises mended international market development. International M&As accomplished by some Chinese large-size enterprises started to present positive effects.

5. Enterprises expanded and industry cluster effect increased.

The taking of the 21st top 100 electronic information manufacturers was 1,120 billion yuan, increasing by 16.9% than the taking of the 20th top 100 ones and accounting for 23.7% in the total amount in the industry. The profit of these manufacturers was 22.3 billion yuan, and the tax was over 35 billion yuan. Export delivery value increased by over 21%. Among the 21st top 100 electronic information manufacturers, 25 companies realized takings of over 10 billion yuan, while the number was 22 among the 20th top 100 ones. The takings of Legend and Haier were over 100 billion yuan, and the takings of Huawei, BOE Co., Ltd and Midea Group were over 50 billion yuan.

The lowest standard of the 21st top 100 electronic information manufacturers was 1.87 billion yuan, increasing by 27% than 1.47 billion yuan of the last top 100 ones. The order of the top 100 enterprises was dynamic. Ten companies were listed for the first time and ten companies were excluded due to restructuring or low growth rate.

The development of the 21st top 100 companies was characterized by the following points:

The general scale continued expanding, and enterprise economy concentration was further heightened. In 2006, the sales volume of colour TV sets was 71.24 million sets among the 100 companies, accounting for 85.1% in the whole industry. The sales volume of programme control switches was 23 million sets, accounting for 31.1% in the whole industry. The sales volume of computers was 25.88 million sets, accounting for 27.7% in the whole industry. The sales volume

of mobile phones was 64.27 million sets, accounting for 13.4% in the whole industry. The total taking of the top 10 companies in these companies was 603.5 billion yuan, accounting for 53.7% in the total taking of the 100 companies. The tax of the first ten companies was 16.7 billion yuan, accounting for 47.7% in the total taking of the 100 companies.

The investment in R&D increased and independent innovation capability was promoted. High-volume R&D investment led to success in core technologies among the top 100 companies. As independent intellectual property was accumulated, the growth rate and amount of patent application in information technology field in China exceeded the growth rate and amount in foreign countries.

Structural adjustment was promoted and basic core products were developed fast. The enterprises developed technologies of next generation network, new generation mobile communication, digital TV, informatized household electrical appliances, IC, software and new-type displays, optimized product structure, and explored new economic growth points.

Enterprises in diverse sectors of the economy developed simultaneously, and the power of private companies increased. In terms of equity structure, the number of solely state-owned enterprises reduced, and the number of collective and private companies increased. Economic sector diversity drove the top 100 companies.

6. Market competition became increasingly furious and industrial pattern was further tuned.

In 2006, foreign-invested enterprises stressed on low-end market, challenged the cost and market advantage of local enterprises, and expanded their market shares.

Upgraded competition in part and accessory sector had a heavy effect on whole-set sector. For example, more furious competition in chip and LCD panel sector largely decreased the price of whole set. This indicated that a competitive pattern based on an industrial chain was taking its shape.

Service providers and channel dealers challenged manufacturers. Telecom operators concentrated on customization service, large-size channel dealers entered manufacturing field, and some outsource-oriented factories started to develop their own brands. This will lead to a reshuffle in the

industrial pattern.

The competition between states and between regions became drastic. Neighbouring regions increasingly stressed on developing electronic information industry, and increasingly showed their advantages in market and labour force. International industrial transfer and multinational investment started to diverge.

7. Software sector development

In 2006, the sales revenue of software industry was 480.1 billion yuan, increasing by 22.9% than 2005. The added value was 183.8 billion yuan, increasing by 22%. The number of practitioners reached 1.29 million.

The industrial structure was optimized. The growth rate of software service and system integration exceeded that of software products, and the proportion of software service and system integration in the total revenue in software and information service industry rose year by year. The sales income of software service and system integration was 238.4 billion yuan in 2006, accounting for 49.6% in the total sales income in software and information service industry. Under the financial support supplied by the state, enterprises and other entities invested more in R&D and made progresses in operating system, database, middleware, Chinese language office software, and information security software.

There were almost 100 software companies with more than 1,000 employees in 2006, 62 companies with more than one billion yuan of software sales income, and 594 companies with more than 100 million yuan of software sales income. The number of key software companies planned by the state was 152, including 69 companies with more than 100 million yuan. By the end of 2006, 448 companies have passed CMM/CMM12~5 appraisal and 38 companies have passed CMM5/CMM15 appraisal.

In 2006, software industry scale of five provinces and municipalities in China was over 30 billion yuan, and they were Beijing, Guangdong, Shanghai, Jiangsu and Zhejiang. The total scale was 308.8 billion yuan, accounting for 64.3% in the total scale of China.

Software and information service outsourcing sector developed fast and became a new economic

growth point in software and information service industry. In 2006, Chinese software export was over US$6B, and the income of software and information service outsourcing was over US$2B. Embedded software was more widely used. The total production value of embedded software reached 102.8 billion yuan in 2006, and the revenue of embedded software accounted for 21.4% in the revenue of the whole software and information service industry.

The sales revenue of Chinese e-game market was 6.54 billion yuan in 2006, increasing by 73.5% than 2005. The direct income that e-game sector brought to relevant sectors was 33.32 billion yuan, which was 5.1 times of e-game market size. Independently developed Chinese online games showed strong competition potentials, and the market size reached 4.24 billion yuan.

The outcome of the education with record of formal schooling for software professionals was noticeable. In 2006, 29,000 postgraduates in software and relevant majors left universities and colleges, and 72,000 graduates and junior college students left school. There were 35 demonstration software schools and 35 demonstration software vocational schools.

The Ministry of Information Industry formulated the Software Company Certification Standard and Management Rules, Software Product Management Rules, and supportive regulations with relevant authorities in 2006. Software property right deals were standardized, genuine software work was enhanced, the strike on software piracy was enhanced, and market environment for software industry development was improved.

IV. Industrial management in information industry

1. Governmental functions were further transferred and policies and regulations were further improved.

The Ministry of Information Industry played governmental roles in an all-round way in 2006 and made achievements in the transformation of governmental functions, administration according to law, and team building. The Ministry promoted drafting the Telecom Law and revising the Post Law and Radio Management Regulations, and issued some regulations, including the Management Rules on Pollution Control of Electronic Information Products. Meantime, the

Ministry initiated the research and formulation of the Development Regulations on Software and IC Industry, formulated schemes on advancing administrative law enforcement responsibility system, enhanced policy making, information release and administration publicizing, implemented post system reform, continued carrying out CEPA and industrial cooperation between Chinese mainland and Hong Kong, Macao and Taiwan, and successfully held the second and third technical standard forums of information industry across the straits.

2. Market regulation, social management and public service were enhanced to promote industrial transfer

The state reinforced to plan and guide industrial development, and formulated the industrial plan, functional plan and regional plan during the Eleventh Five-year Plan period. Telecom regulatory authorities insisted on the concept of putting people first and regulating for the public and the requirement of maximizing social benefit, safeguarded legal rights and interests of consumers, worked hard to create new management modes, carried out various activities, such as Smooth Network and Sincere Service, and Sunshine Green Network Project, and made achievements in network convergence and network and information security management. Competent authorities solved frequently complained problems, including mobile information service and junk mails, boosted the reform of telecom charging management mode, guided enterprises to reduce relatively high mobile service charge and inter-region calling charge in some areas, strengthened the supervision on construction project management and quality, improved telecom construction market order, revised and issued the Frequency Segmentation Regulation, enhanced station management, carried out special campaigns in striking software piracy and rectifying mobile phone market order with relevant departments, intensified the management on tax-control gathering machine and other products, neatened and normalized electronic information product industry, and intensified safe production supervision and management.

3. State innovation strategy was implemented and technological progress was made.

In 2006, the Ministry of Information Industry held the National Technological Innovation

Conference of Information Industry, promulgated the Outlines of the Eleventh Five-year Plan and Medium and Long-term Plan for 2020 of Technological Development in Information Industry, initiated the implementation scheme formulation of key technological projects, such as the new-generation broadband wireless mobile communication, set up a number of software and IC public service platforms, and brought the function of industrial allies on R&D and fruit industrialization into play. Technologies and products with independent intellectual property emerged in IC, software, digital TV, digital trunking, optical communication, and information security. Operators established R&D centres and invested more in R&D, and improved the innovation mechanism. New fruits were produced in standard and intellectual property field, 284 industrial standards were released in 2006, and 49 of them were approved national standards.

4. National informatization development strategy was implemented and social informatization building was boosted.

The National Informatization Development Strategy was carried through industry wide in 2006, key informatization projects were pushed up under the support of relevant departments, and the work on electronic administration, e-commerce, and enterprise and city informatization was reinforced. The Electronic Signature Law was implemented, electronic certification service was improved, and network credit system was further built stably. The formulation of the Information Technology Application Regulations was initiated, and the multiple plan of information technology dissemination was fulfilled. The Opinions on the participation of the Information Industry in Building a New Socialist Countryside were studied and proposed, and initial outcomes were made in trial comprehensive information service in rural informatization. The supervision on information system engineering was enhanced, and the pilot project of modern long-distance education for cadres in rural areas was promoted.

5. International cooperation and exchanges

International cooperation and exchange was strengthened, Chinese enterprises developed the international market in a wider scope, and foreign capital was more effectively utilized. China

modulated the export tax rebate of some electronic products, did a good job during the transition period after China's access to the WTO, and took part in negotiations between China and free trade zones of related countries and regions. Cooperation between China and the US, Russia, ASEAN, and Japan-Korea were enhanced. The candidate for ITU deputy general secretary recommended by China was elected, and China continued to act as a trustee state in ITU. ITU Telecom World 2006 was successfully hosted in Hong Kong under the support of relevant parties.

A number of international information communication conferences were held in China in 2006, and many cooperation agreements were signed between national governments and between competent departments under national governments. Relevant bodies also took part in or organized a series of activities of Russian Year.

V. Development objectives of information industry in 2007

1. Macro control objectives in information industry in 2007

The added value reaches 1,860 billion yuan, including 530 billion yuan in communication sector, 1,330 billion yuan in electronic information sector. The total communication service amount reaches 1,870 billion yuan (increasing by 23%), and the revenue of non-voice services accounts for 30%. The number of new fixed line users and mobile subscribers will be 70 million, and the total number reaches 900 million. The popularization rates are 29% and 39.4% respectively. Fixed asset investment will be over 200 billion yuan. The sales revenue of major services in electronic information industry will be 5,800 billion yuan, increasing by 22%. The sales amount of software and system integration will be 580 billion yuan, increasing by 21%. The total profit and tax will be 280 billion yuan, increasing by 7%. Export amount will reach US$400B, increasing by 10%.

2. Major tasks in 2007

The scientific outlook on development shall be implemented in an all-round way, the structure, scale and quality shall be stressed at the same time, and the industrial increase mode shall be transferred to an intensive mode. The technology, service and market shall be closely combined

with each other, and independent innovation capacity shall be promoted. The principle of putting people first and regulating for the public shall be insisted on, harmonious development in both rural and urban areas shall be boosted, and hot issues shall be taken as key problems to be solved. Administration according to law shall be persisted in, government functions shall be further transformed, system and mechanism reform shall be deepened, telecom and electronic industries shall be energetically advanced, and rapid and healthy development shall be realized.

The following aspects shall be reinforced in 2007:

1. Strengthen and improve macro guiding and boost functional transfer and administration according to law;
2. Push restructuring and upgrade in electronic industry;
3. Expedite telecom sector development and industrial transfer;
4. Improve technological innovation capacity in information industry;
5. Reinforce and standardize market management;
6. Provide communication service and support for the building of a new socialist countryside;
7. Expedite product export and international cooperation and exchange;
8. Promote network and information security management;
9. Step up informatization and information technology application.

Chapter III Chinese electronic information industry development and potential analysis

This chapter analyzes the development of key fields in Chinese electronic information industry from 2001 to 2005. The analysis includes household electrical appliances, but it excludes white goods.

Section I Review of electronic information industry during the Tenth Five-year Plan period

I. Industrial development during the Tenth Five-year Plan period

The Tenth Five-year Plan period of China is from 2001 to 2005.

During the Tenth Five-year Plan period, Chinese electronic information industry developed fast,

and China became an important electronic information product manufacturing base in the world. Initial achievements have been made in industrial restructuring, significant achievements have been made in some key fields, and core basic sectors, such as software and IC, developed rapidly. Industrial agglomeration effect became obvious, and continued advancing national economy. Electronic information industry has become the largest industry and largest export industry in Chinese industrial development.

1. Major economic objectives were reached in advance

From 2000 to 2005, the sales revenue increased from 607 billion yuan to 3,840 billion yuan, industrial added value grew from 133 billion yuan to 900 billion yuan, accounting for 4.94% in the GDP, the export amount mounted from US$55B to US$268B, accounting for 35% in the total export amount in China, and the contractual foreign investment amount was about US100B. See Figure 1 for Chinese electronic information industry scale from 2001 to 2005.

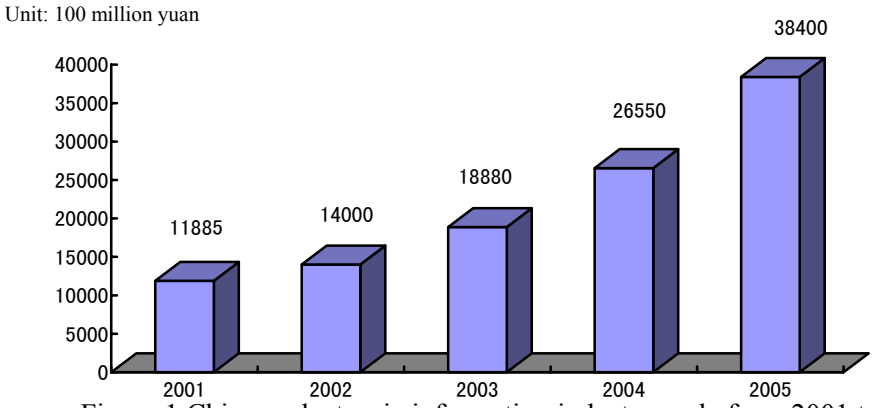


Figure 1 Chinese electronic information industry scale from 2001 to 2005

2. Turnout and sales volume of major products were among the top in the world

In 2005, China produced 303 million mobile phones, 81 million PCs, 82.83 million colour TV sets, 86.17 million colour kinescopes, and 34 billion IC blocks. The turnout of colour TV, colour kinescope, PBX and mobile phone was at the first place in the world, and the turnout of computer, printer and CD-drive were among the top in the world. The display turnout manufactured within

Chinese territory accounted for 50% of the total output in the world, mobile phone turnout accounted for 31% in the world, colour TV set turnout accounted for 43%, laser disc drive turnout accounted for 80%, and laptop turnout accounted for 40%.

3. The industry plays a more important role in national economy.

The proportion of added value of Chinese electronic information industry in the total GDP increased from 1.6% at the end of the Ninth Five-year Plan period to 4.94% in 2005. Chinese electronic information industry contributed 8.8% to GDP growth, and the driving power increased. The industrial added value of electronic information industry accounted for 13.6% in the total added value of industry of China. The growth rate of electronic information industry was 11.8% higher than the average industrial growth rate in China, and the contribution rate reached 20.8%. Chinese electronic information industry played a more and more important role in national economy. In 2005, the foreign trade amount of electronic information products was US$488.73B, accounting for 34.4% in the total international trade amount of China. The export amount was US268.17B, accounting for 35.2% in the total export amount of China and increasing by 29.2%. The import amount was US$220.56B, accounting for 33.4% in the total import amount of China and increasing by 21.9%. The export and import amounts ranked at the first among all industries. The industry continued to act as a pillar in export in China. See Figure 2 for export amount of Chinese electronic information products from 2001 to 2005, and see Figure 3 for the proportion of electronic information products in Chinese export amount from 2001 to 2005.

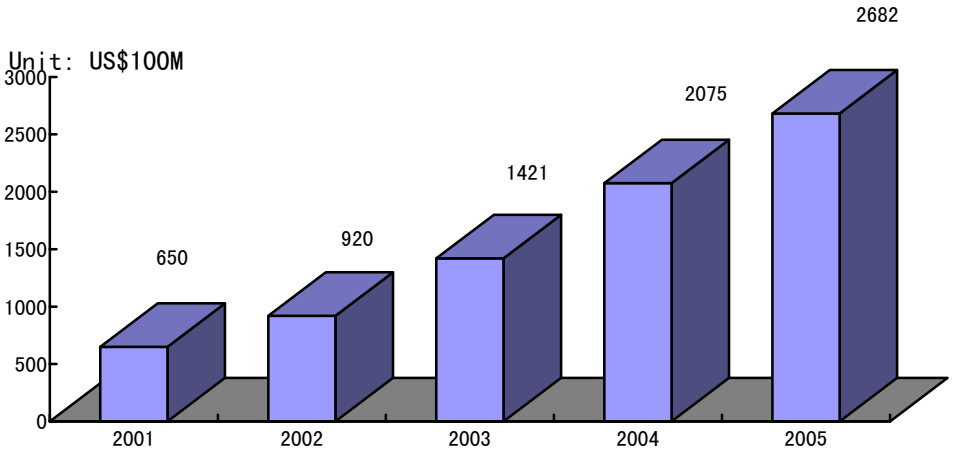


Figure 2 Export of Chinese electronic information products from 2001 to 2005

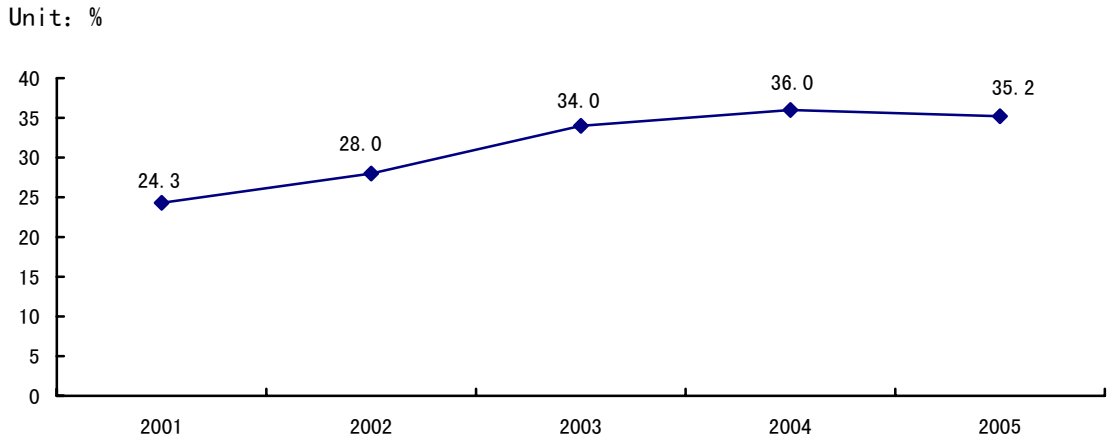


Figure 3 Proportion of electronic information products in Chinese export amount from 2001 to 2005

By the end of 2005, the total number of employees in the industry was 7.6 million, 6.9 million higher than the number in 2000. The industry contributed to China's employment.

4. Industrial quality was rapidly improved thanks to restructuring.

Product structure aimed at high technology, high quality and high added value. The scale and technological level of key products have been largely improved. The proportion of entire

machines and parts and accessories that contain high technologies in exports rose. The output of mobile phones mounted from 53.96 million in 2000 to 303 million in 2005, increasing by 40% per year. The industrial size of mobile phone ascended to the top in the world. The proportion of accessories in export amount stably increased, new accessory sector developed fast, and industrial status constantly rose up. LCD and plasm module products became a new economic growth point. The output of the products increased by over 200% in 2005. The laptop turnout accounted for 60% in microcomputer turnout, increasing by 5% than 2004.

Industrial concentration was high, and regional agglomeration effect got increasingly apparent. China has established nine state-level electronic information industrial bases and 34 state-level parks, which have formed regional industrial clusters. In the Yangtze River Delta, Pearl River Delta and Bohai Sea Rim, the proportions of labour force, sales revenue, industrial added value and profit in the whole industry were all over 80%, and the leading positions were consolidated. The industrial size and total profit of the nine state-level bases accounted for over 3/4 in the whole industry. Industrial cluster effect and base advantages became notable and increasingly important in global industrial layout.

Advantageous enterprises quickly rose. By the end of 2005, two enterprises hit the sales revenue of over 100 billion yuan, and 22 enterprises over 10 billion yuan. Lenovo, BOE, Huawei, ZTE, Haier and TCL have made breakthrough in multinational operation and accumulated experience in grasping core technology in a short time, expanding company scale, improving management, attracting international professionals, and setting up global marketing network through going global.

5. Core sectors speeded up to develop.

The State Council issued policies on promoting IC and software in 2000. Under the guide and drive of industrial policies, the sales revenue of software and system integration in China was 390 billion yuan in 2005, 4.9 times of that of 2001. The software export gained US$3.59B, five times of that of 2001. Software sector started to largely push information industry and national economy. The industrial scale of IC reached 70.23 billion yuan, increasing by 55.2%, 3.8 times of that of

2001. The sales revenue of IC design was 12.43 billion yuan, increasing by 53%. Products with independent intellectual property were put into the market. Over the past five years, China set up nine 8-inch IC production lines and one 12-inch IC production line. The gap in chip manufacturing between Chinese level and international level has been largely reduced.

In 2005, the sales revenue of component sector was 1,110.9 billion yuan (including electronic parts, electronic components and electromechanical components), increasing by 17%. Enterprises expanded, products turned small and flat, and product frequency turned higher. Over 80% of electronic components were flat. The outputs of capacitors, inductors and special micro motors were among the top in the world. New-type flat panel display components have been largely promoted. Two 5-G TFT-LCD pre-procedure production lines were set up and put into production, and the number of patents in TFT-LCD field drastically went up.

During the Tenth Five-year Plan period, encouraging progresses have been made in electronic material and dedicated equipment. The turnout of ever-magnet ferrite ranked at the top in the world, and the technology reached to world-class standard. IC production equipment at 6-inch level or below could meet partial domestic demand, 8-inch ion injection device was invented, and filling and sealing devices used to produce back-course modules of small-size LCD displays and COG have been introduced to mainstream market.

6. Significant progresses have been made in some key technologies.

New progresses have been made in IC, software, mobile communication, new-type elements and accessories, digital video and audio, computers, and other fields. Transnational M&A has become an effective way through which Chinese enterprise improve key technological level and promote core competitiveness. TD-SCDMA, GoTa, GT800, IGRS and family network standards, which were initiated by enterprises or enterprise allies, have been issued.

In terms of IC, China is able to design, develop, and commercially produce 0.18-0.25-micron ICs. Some high-performance chips have been developed. The chips for the 2G ID cards can be put into mass production. Software products with independent intellectual property have been widely used in each sector of economic and social development, and the market share is relatively high. In

terms of communication industry, digital PBX, digital mobile communication, DWDM, and other key products can be put into mass production, and the technological level is at the world class. TD-SCDMA is recognized as one of the 3G communication standards by ITU and 3GPP. The gap of core technology of new-type components and photoelectron between Chinese status and international advanced level is being reduced, and mass production technology for optical fibre pre-set bar has been tackled. Significant progresses have been made in digital TV standard formulation, cable digital TV products that use set-card separation technology have been commercialized, and support capacity for key parts, such as dedicated chips and digital tuners, has been largely promoted. The calculation capability of Galaxy computer and Dawning computer rose to among top 100 in the world. High-performance servers, such as Lenovo Shenteng Server, broke down foreign blockage in high-end server sector. Routers and switches produced by Huawei and ZTE have reached international standard. Notable achievements have been made in next-generation Internet core equipment R&D.

II. Experience during the Tenth Five-year Plan period

1. Formulate policies that benefit for industrial development

During the Tenth Five-year Plan period, the stress and support by the state for Chinese electronic information industry played a key role in the development of the industry. Under the support of the State Council and relevant authorities, China issued many policies promoting mobile communication, IC and software sectors, adjusted export tax rebate ratio of some electronic products, and timely updated foreign investment industry category and the category of industries in which China encourages to invest. The Ministry of Information Industry issued documents to push information industry to go global and build national electronic information industrial bases and parks, and formulated industrial implementation guidelines for carrying through national strategies of Revitalizing the Northeast and Western Development. Since 2002, the Ministry of Information Industry held work report meetings of key tasks in electronic information industry on a periodical basis of each year, disseminated annual key task arrangements to the whole industry,

improved industrial technological development policies, and organized to formulate technical standards. These measures and policies have improved industrial development context, encouraged Chinese and foreign enterprises, guided Chinese IC, software and mobile communication sectors to develop fast, advanced regional industrial restructuring and differentiated development, and driven information industry into an industry with the largest scale and potentials in China.

2. Insist on the development approach of opening and cooperation

During the Tenth Five-year Plan period, Chinese electronic information industry made full use of the opportunity of China's access to the WTO, adjusted policies and measures, and tried to attract more foreign investment. According to preliminary statistics, all electronic information enterprises among Fortune 500 enterprises have invested in China, and 90% of top 100 information technology companies in the world have directly invested in China. In electronic information industry, the proportion of foreign investment in the total foreign investment in China increased from 10% at the end of the Ninth Five-year Plan period to over 15%.

The position of foreign-invested companies continued rising in electronic information industry. In 2005, the sales revenue of foreign-invested companies was 2,402.1 billion yuan, accounting for 77% of the total revenue of all companies above designated scale. The industrial added value was 502.6 billion yuan, accounting for 77% of the total added value of all companies above designated scale. The profit was 82.2 billion yuan, accounting for 77% of the total profit of all companies above designated scale. The export amount was US$234.1B, accounting for 87% of the total amount of all companies above designated scale. Foreign-invested companies have largely pushed the whole industry.

Over the past five years, the industry responded to various trade barriers and discriminative anti-dumping terms, encouraged companies to go global by making use of two markets and two kinds of resources, energetically extended industrial development space, promoted cooperation between communication operation and manufacturing, constructed inter-support industrial chains, and worked hard to develop the international market.

3. Support advantageous enterprises in priority

Through policy guidance and arrangements of significant projects, enterprises with advantages in the industry were supported, and instruction and assistance were provided for leading companies in terms of transnational M&A and responding to barriers to trade in order to promote their international competitiveness. In 2005, the total revenue of the top 100 electronic information companies was 964.3 billion yuan. The size of Lenovo and Haier was close to the lowest standard of world top 500 electronic information companies. BOE, TCL and Huawei were marching to 100 billion yuan. Some companies have started to participate international competition at a higher level, and have had large-volume export capacity with independent brand and transnational operation capabilities. In addition, the state also provided strengthened guidance and special fund to support innovative small and medium-size companies with their own characteristics.

4. Make use of key projects to advance technological progress

During the Tenth Five-year Plan period, the state organized and implemented many key projects, including digital mobile communication industrialization, digital TV R&D and industrialization, TD-SCDMA R&D and industrialization, software industry, network products, new-type components, photoelectron products, auto electronics, next generation Internet, information security products, company technical progress, industrial upgrade, and enterprise informatization, cultivated software, IC and new-type components core industries, and built up industrial chains of 3G mobile communication, digital TV and photoelectron products. The central government has invested more than 10 billion yuan over the past five years, and province-level governments also set up special funds to advance industrial development, push private investment, promote industrial transfer of independent intellectual property results, drive technical progress and product restructuring among enterprises, and intensify industrial development potentials.

5. Drive industrial development with informatization utilization

During the Tenth Five-year Plan period, Chinese informatization building was deepened. Wide

application of information technologies and products provided development opportunities for industrial development, in particular local enterprises. In recent years, the popularization rate of information infrastructure standard and information terminals in China kept increasing, which advanced communication, computer, video-audio products, entire machine, and relevant component sectors. Significant informatization projects, including electronic administration, e-commerce and company informatization, went on smoothly, and speeded up software, information service and information security sectors. Informatization building put higher requirements on information technology and product, and expedited technical innovation and product update.

6. Explore new methods for building industrial professional teams

During the Tenth Five-year Plan period, Chinese electronic information industry explored talent cultivation, introduction and arrangement. Talent cultivation work was implemented on schedule, and progresses were made in talent cultivation for various directions. Vocational qualification certification was carried out among computer and software specialists, private investment was absorbed to run software schools, and software engineering master education oriented to application was strengthened. The mechanism of joint cultivation of professionals by using international resource was established, talent absorption work was reinforced, and talent encouragement mechanism was improved. Supportive policies were made to encourage and attract software and IC technicians to access to hi-tech technological parks and software development zones. Foreign IT professionals were encouraged to come to China. The industry tried to create a favourable environment to attract and keep talents through technical improvement, provision of shares of management and intellectual property, options, and other encouragement measures.

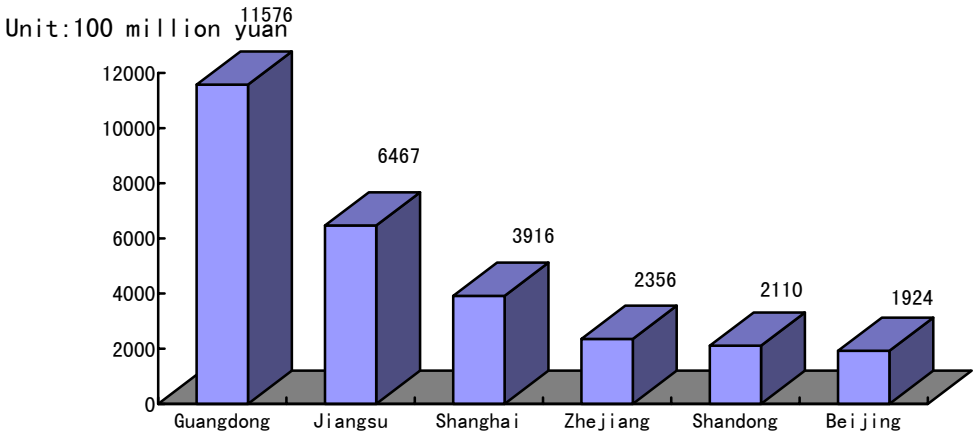


Figure 4. Top six provinces with the largest gross industrial production value in electronic information manufacturing in 2005

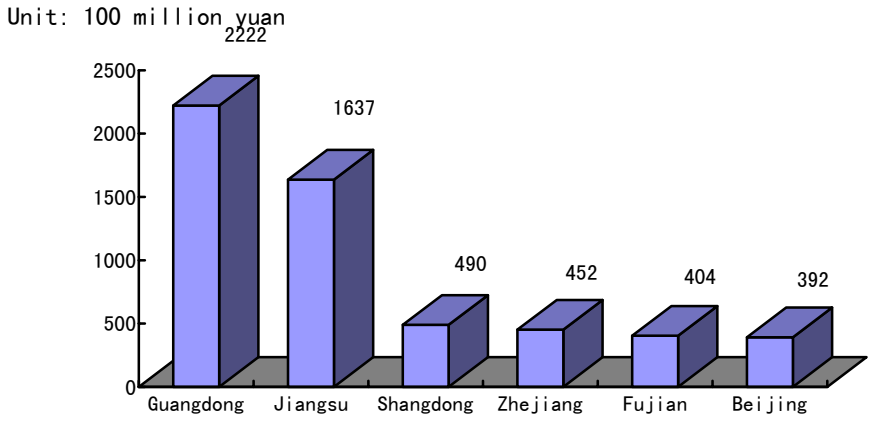


Figure 5. Top six provinces with the largest industrial added value in electronic information manufacturing in 2005

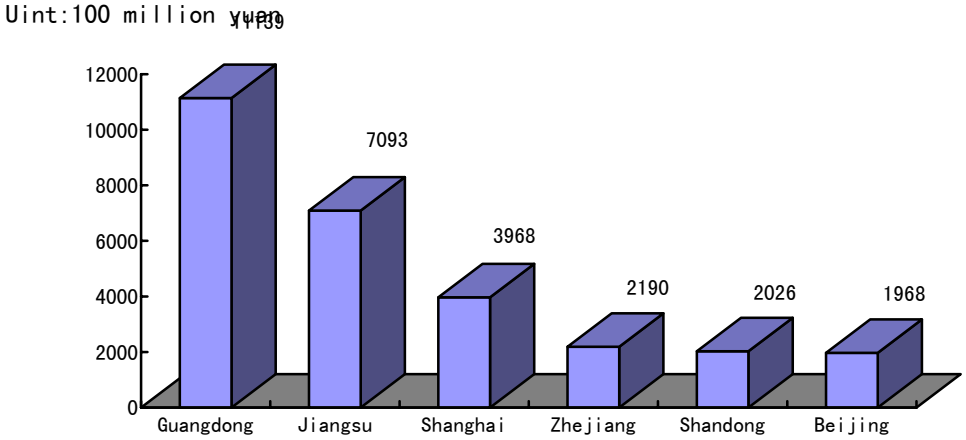


Figure 6. Top six provinces with the largest sales revenue in electronic information manufacturing in 2005

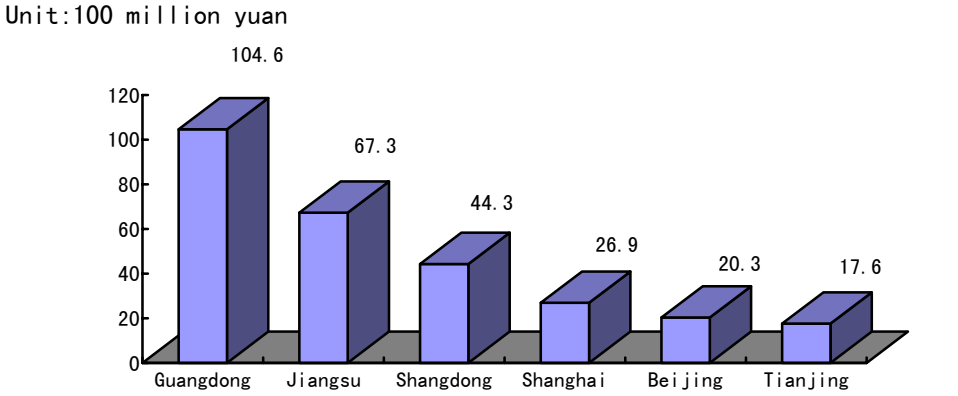


Figure 7. Top six provinces with the largest profit and tax in electronic information manufacturing in 2005

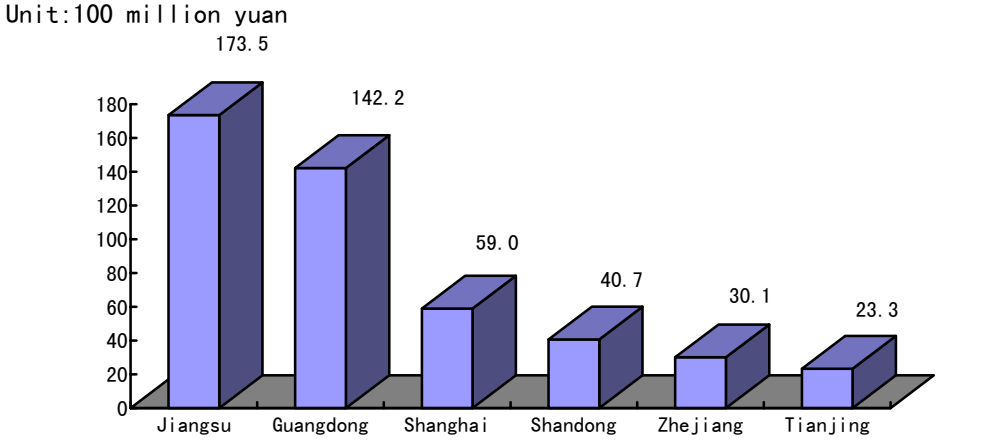


Figure 8. Top six provinces with the largest foreign investment utilization in electronic information manufacturing in 2005

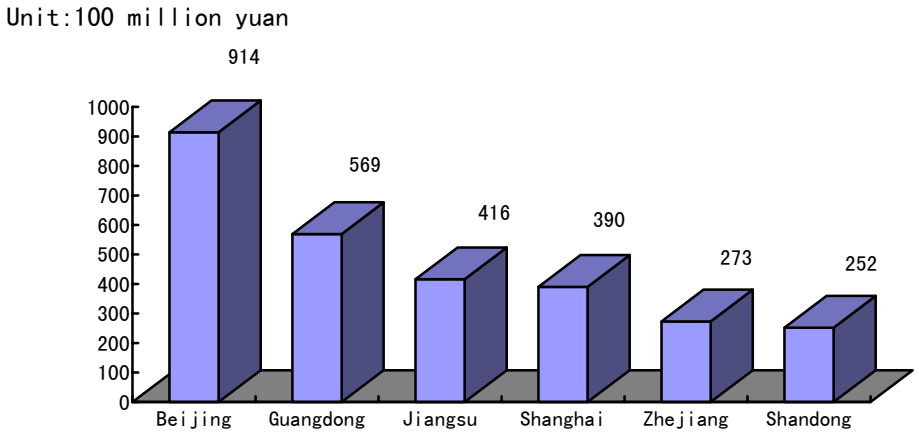


Figure 9. Top six provinces with the largest software revenue in 2005

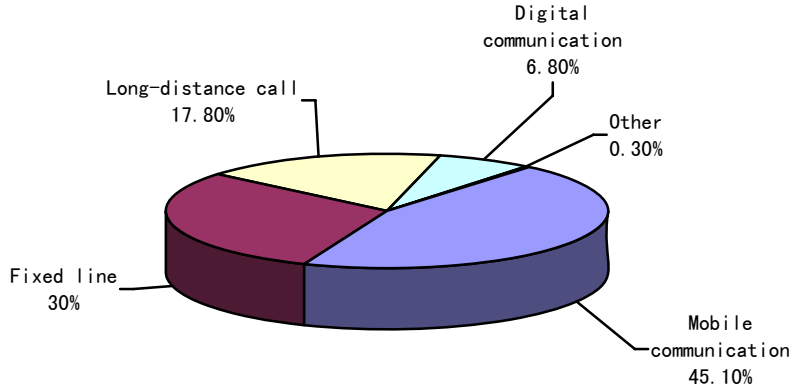


Figure 10. Proportions of communication services

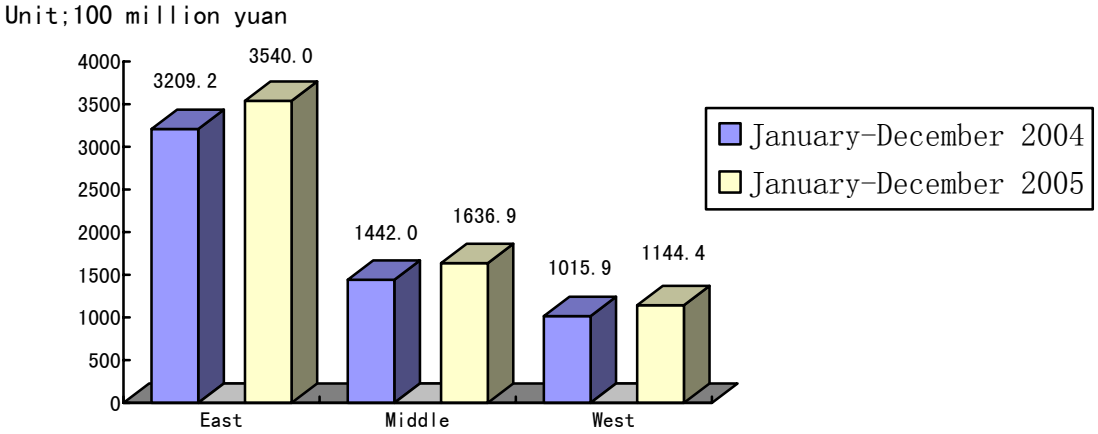


Figure 11. Communication service revenue in the East, Middle and West of China from 2004 to 2005

Table 1. List of national electronic information industrial parks in 2005

No.	Applicant	Name of national electronic information industrial park
01	Administrative Committee of Beijing Economic-Technological Development Area	National Communication Industrial Park (Beijing)
02	Administrative Committee of Tianjin Economic-Technological Development Area	National Communication Industrial Park (Tianjin)
03	Administrative Committee of Qingdao Hi-tech Industrial Development Area	National Communication Industrial Park (Qingdao)
04	Administrative Committee of Hangzhou Hi-tech Industrial Development Area	National Communication Industrial Park (Hangzhou)
05	Beijing Strong High-tech Development Corp.	National Computer and Network Product Industrial Park (Beijing)
06	Administrative Committee of Hangzhou Economic-Technological Development Area	National Computer and Network Product Industrial Park (Hangzhou)
07	Administrative Committee of Fuqing Rongqiao Economic-Technological Development Area in Fujian	National Display Industrial Park (Fuqing)
08	Administrative Committee of Qingdao Economic-Technological Development Area	National Household Electronic Product Industrial Park (Qingdao)
09	People's Government of Shunde District, Foshan City, Guangdong Province	National Household Electronic Product Industrial Park (Shunde)
10	People's Government of Huizhou City, Guangdong Province	National Video-Audio Product Industrial Park (Huizhou)
11	Administrative Committee of Tianjin New-tech Industrial Park	National Chemical and Physical Power Supply Industrial Park (Tianjin)
12	People's Government of Xinxiang City, Henan Province	National Chemical and Physical Power Supply Industrial Park (Xinxiang)

13	Administrative Committee of Guiyang Hi-tech Industrial Development Area	National Piece-shape Component Industrial Park (Guiyang)
14	Administrative Committee of Tianjin Economic-Technological Development Area	National Piece-shape Component Industrial Park (Tianjin)
15	Jiaxing Information Industry Bureau of Zhejiang Province	National electromechanical Component Industrial Park (Jiaxing)
16	People's Government of Fuyang City, Zhejiang Province	National Optical Fibre and Cable Industrial Park (Fuyang)
17	Administrative Committee of Tongling Electronic Material Industrial Park of Anhui Province	National Electronic Material Industrial Park (Tongling)
18	People's Government of Yichang City, Hubei Province	National Electronic Material Industrial Park (Yichang)
19	People's Government of Anyang City, Henan Province	National Display Product Industrial Park (Anyang)
20	Xianyang Development and Reform Committee of Shaanxi Province	National Display Product Industrial Park (Xianyang)
21	Administrative Committee of Nanjing Economic-Technological Development Area	National Display Product Industrial Park (Nanjing)
22	Administrative Committee of Fuzhou Economic-Technological Development Area	National Display Product Industrial Park (Fuzhou)
23	People's Government of Foshan City, Guangdong Province	National Display Product Industrial Park (Foshan)
24	Administrative Committee of Wujiang Economic-Technological Development Area of Jiangsu Province	National Display Product Industrial Park (Wujiang)
25	Shanghai Zhangjiang (Group) Co., Ltd	National IC Industrial Park (Shanghai)
26	Administrative Committee of Zhongguancun	National IC Industrial Park (Beijing)

	Science Park	
27	Administrative Committee of Suzhou Industrial Park	National IC Industrial Park (Suzhou)
28	Administrative Committee of Ningbo Bonded Area of Zhejiang Province	National IC Industrial Park (Ningbo)
29	Administrative Committee of Tianjin Economic-Technological Development Area	National IC Industrial Park (Tianjin)
30	Administrative Committee of Wuhan East Lake High-tech Development Zone of Hubei Province	National Photoelectron Industrial Park (Wuhan)
31	People's Government of Xuchang City, Henan Province	National Electric and Electronic Systems Industrial Park (Xuchang)
32	Administrative Committee of Wuxi New District	National LCD Industrial Park (Wuxi)
33	People's Government of Mianyang City, Sichuan Province	National Video-audio Product Industrial Park (Mianyang Science and Technology City)
34	Administrative Committee of Chengdu Economic-Technological Development Area	National Electronic Component Industrial Park (Chengdu)

Section 2 Performance of main sectors of the electronics and information industry in 2005

I. Communication equipment manufacturing industry

1.General introduction

In 2005 which is the last year of the 10th Five Year Plan period, the communication equipment manufacturing industry has maintained a good development momentum with further improved production capacity and concentration and new breakthroughs in scientific and technological

development. The economic indexes of the equipment manufacturing industry continuously maintained a leading position in the electronics and information industry. Spurred by the good development momentum of 3G in the international market, the mobile communication industry continuously develops rapidly in China. The TD-SCDMA has basically reached the level of large-scale commercial application. A batch of state-owned TD-SCDMA manufacturers have grown up and formed a complete industry chain, enabling the mobile communication industry to enter into a new development stage. The China-made digital trunking communication products have passed the technical assessment, entered into the practicality and industrialization stage and have been successfully employed. The optical transmission equipment development has tended to mature and reached the world-leading level in terms of the technical advancement and commercialization. The optical fiber and optical cable industry is recovering; great progresses have been made in the network communication equipment. The broadband access equipment gradually becomes the major force of the sector. The network equipment has started to prize the high-end market after occupying the intermediate and lower-end market, obviously enhancing development of the e-governance, e-business, enterprise informatization and social informatization of the urban and rural areas. The export of communication products has increased compared with that of the previous year; the independent innovation capability and market competitiveness of the enterprises have been improved slightly. The general situation of the communication industry of China in 2005 shows that the macro control measures of the central government have been put into effect, and achievements have been made in the industry and product restructuring of the communication equipment manufacturing industry. The sector enjoys a good development momentum.

2.Production and sale

In 2005, the communication equipment manufacturing industry reported sales revenues of 613.2 billion yuan, increased by 29.7% on a year-on-year basis, accounting for 15.96% of the total sales revenues of products of the electronics and information industry; completed 147.2 billion yuan of industrial increment value (current price), up 27.1%, accounting for 16.34% of the industry

increment value of the electronics and information industry; the sector reported profits of 24.4 billion yuan, decreased by 15.4%, accounting for 18.67% of the total profits of the electronics and information industry; it completed 10.3 billion yuan of taxes, up 42.3%, accounting for 10.4% of the electronics and information industry; the product export value reached US$43.364 billion, up 45.85%, accounting for 19.8% of the total export of the electronics and information industry; the product import value reached US$16.028 billion, up 15.32%, accounting for 7.26% of the total import value of the electronics and information industry.

In 2005, the production and sale of the communication equipment manufacturing industry show the following characteristics:

（1），Changing and complex development environment, stable growth of production speed

In 2005 the main economic indexes of the communication equipment manufacturing industry grow steadily. The communication equipment manufacturing industry ranked the first position in terms of the total taxes and the second position in terms of the sales revenue, industry increment value and export value. Affected by the domestic and international environment, the total profits of the sector has decreased compared with that of the previous year, but still maintained the first position of the industry. The communication equipment manufacturing industry is still an important element driving economic benefit growth of the electronics and information industry.

（2），Growth mode changes gradually and the overall strength buildup

By means of reform deepening and industry restructuring, the communication equipment manufacturing industry has gradually transferred from the extensive mode to intensive mode in terms of the economic growth mode. Most of the enterprises have paid attentions to control the gross, reduce inventory, adjust the structure, develop new products and increase technical contents of the products. The mobile phone sector has secured its leading role in the industry in the market competition. While the mobile phone market access system has transferred from application and approval to ratification, the sector attracted many new enterprises. Currently there are more than 60 enterprises in the sector and the overall strength of the sector has been enhanced, boosting the production speed, output, sales revenue and export significantly.

（3），Rapid development of the telecom operation sector enhances development of the

manufacturing industry

In 2005, the telecom operation sector has maintained the rapid development. The sector has completed 1,219.8 billion yuan of communication businesses in total, up 24.6%; it reported business revenues of 637.3 billion yuan, up 11.3%; newly increased fixed line subscribers have reached 38.67 million households and newly increased mobile phone subscribers have reached 58.60 million households. As of the end of 2005, the total number of the fixed line subscribers reached 350 million households while the mobile phone subscribers reached 393 million households. The popularization rate of the fixed line reached 27.0% while that of the mobile phone has reached 30.3%. Stimulated by the rapid development of the telecom sector, the handset output has reached 304 million sets, up 30%. The fixed line phone sets, program-control exchanger, mobile exchange and mobile workstation have maintained a steady development.

（4），Growing market demand stimulates the industry to develop rapidly

The year of 2005 has seen adjustment of the communication product manufacturing industry. The facts that the next generation communication system building is coming, the central government is carrying out the communication and informatization project in the rural area, the operators increase procurement of the communication equipment and get involved in the sales juncture of the terminal field via product customization to prepare for improving the network system and launching new businesses has boosted the communication manufacturing industry. In addition, the global telecom investment has increased gradually, the multinational companies have increased investment in China and resource integrating and the domestic telecom operators and equipment enterprises are speeding up paces of going global. All these elements have driven the product export to grow rapidly.

（5），Soaring export drives the industrial economy development

The communication product export in 2005 increased by 45.85% on a year-on-year basis, about 10 percentage points higher than that of the whole industry, contributing to the total export of the electronics and information industry which broke US$200 billion.

Currently the communication equipment manufacturing industry of China is expanding its size with a solid industry foundation and obviously improved production concentration. Famous

brands, dominant enterprises and industrial bases are taking shape and the international competitiveness are boosting.

3.Scientific research and new product development

（1），3G mobile communication system

As of 2005, breakthroughs have been made in the R&D and industrialization of the TD-SCDMA. A complete industry chain has been formed with completion of the TD-SCDMA core network, base stations, terminals and the peripheral product systems such as different chips, driving the TD-SCDMA products to get mature and commercialization. In terms of the system equipment development, Datang Telecom Technology & Industry Group (Datang Telecom for short), TD Tech Co. Ltd.(TD Tech for short), ZTE, Putian Telecommunications and so on have improved their R&D works and enhanced development of the TD-SCDMA system. The system equipment of these enterprises has been transferred to network testing. On the terminal chip development, Spreadtrum Communications Inc., Beijing Tianji Technologies, Commit Information Technologies Co. Ltd., Datang Telecom, Chongqing Chongyou Information Technology Co. Ltd., and Holley Communications all have made breakthroughs. Following Datang Mobile which developed the first TD-SCDMA handset of the world, Amoi, Hisense, Ningbo Bird, Lenovo Holdings, CECW, Holley Communications, Chongyou Information Technology and Inventec Appliances Corp. have completed their commercial terminal solutions and developed nearly 20 terminals and digital cards. Currently ten-odd products are undergoing network testing. What's more, Beijing Zhongchuang Telecom Test Co. Ltd., Starpoint Communications Software Co. Ltd. and Hubei Zhongyou Technology Industry & Commerce Co. Ltd. and so on have developed the network and terminal online testing equipment. China has made breakthroughs in the product development of the system, chip, terminal, instrument and software and established a basically complete TD-SCDMA industry chain, formed an industry group and laid a foundation for the successive development of the TD-SCDMA technology.

Currently the Chinese enterprises have possessed of hundreds of core patents of TD-SCDMA and formed a TD-SCDMA patent group. Patent protection has been obtained for some patents in the

US and Japan and other countries and regions. The Chinese enterprises consolidated the patent advantages of China in the TD-SCDMA field.

（2），Optical fiber communication equipment and system

Cooperating with the relevant units, the scientific researchers of Wuhan Research Institute of Post and Telecommunication have successfully developed the first STM-256 40Gb/s SDH equipment meeting the ITU-T standard with three years of hard working under organization and guidance of the Ministry of Information Industry. And a long-distance transmission of 560km on the common G652 and G655 optical fiber has been realized.

The project has studied and solved the technical difficulties of 40Gb/s super-high speed optical signal processing, 40Gb/s optical signal modulating and demodulating, STM-256 MUX and framing procedure, large capacity cross-connection, large capacity system design, super-high speed photoelectron devices, 40Gb/s optical fiber transmission, dispersion management technology, large information flow network management technology and the mechanical structure of high-speed high-power equipment, and developed the 40Gb/s SDH equipment meeting the ITU-T standards. On the transmission, the project has solved the core difficulties of dispersion and non-linear of 40Gb/s optical signal transmission. With precision dispersion management and technologies combining EDFA and RAMAN, the project realized error-free transmission of 40Gb/s optical signals of 560km long on the common G652b and G655b optical fibers.

40Gb/s SDH (STM-256) technology is one of the symbols of the super-high speed optical communication technology strength. The breakthrough of the technology in China enables China to reach a world leading level in terms of the optical communication technology. The successful development of 40Gb/s SDH optical transmission equipment and the success of long-distance transmission of 40Gb/s optical signals lay a foundation for China to promote and employ 40Gb/s system equipment.

（3），China-made digital trunking system

The Ministry of Information Technology drafted out the General Development Thinking of 800MHz Digital Trunking Business of China in 2002 and organized the large communication equipment manufacturers such as ZTE and Huawei to conduct R&D of digital trunking technology.

ZTE independently developed the CDMA-based GOTA digital trunking system while Huawei independently developed GSM-R-based GT800 digital trunking system. In June 2006, the GOTA digital trunking system and GT800 digital trunking system was assessed for the technical performance by the relevant technical assessment committees organized by the Ministry of Information Technology, especially their core technologies and technical innovation, and passed the assessment. In October 2005, ZTE's GOTA system was named the exclusive digital trunking communication product used at the 10th National Games of China held in Nanjing for direction and dispatch of the communication missions. The successful application of the system shows the technical advantages and application capability of the China-made digital trunking system.

（4），Wireless access system

SCDMA technology is the wireless access technology with independent intellectual property right independently developed by Xinwei Telecom Technology Inc. of Datang Telecom. So far the company has not only developed 1800MHz comprehensive wireless access system and 400MHz countryside wireless access system, but developed and improved the SCDMA technical standards of which it completely owns the core technologies and the intellectual property rights and realized large-scale commercial application. The technology has won the first prize of National Scientific and Technological Progress Prize and the Gold of China Patent awarded by the State Council.

Currently the network scale and subscribers of the SCDMA wireless access system have increased significantly. As of November 30, 2005, the 1800MHz SCDMA wireless access system has been employed in 116 cities from 21 provinces, municipalities and autonomous regions with support and coordination from the operators. The operators included China Telecom, CNC, Unicom, China Railcom and the dedicated networks of PetroChina and Sinopec. The network scale exceeded 10million lines with more than 3 million of subscribers. These operators also set up networks in Sri Lanka and Mongolia etc.

Since passing the design finalization assessment for production conducted by the Ministry of Information Industry in February 2005, 400MHz SCDMA rural wireless access system has experienced rapid growth of application. Nearly 500,000 lines of networks have been built in 18 provinces, municipalities and autonomous regions with more than 100,000 subscribers. The

system plays an important role in the project of extending telephone access to every village implemented by the Ministry of Information Industry.

（5），Scientific and technological achievements

A batch of scientific and technical achievements of the communication industry won awards from the central government and the Ministry of Information Industry in 2005, including 3 achievements submitted by the Ministry of Information Industry (see Table 1 for details) and 3 achievements submitted by the other units of the information industry (see Table 2 for details). Including the awards mentioned above, a batch of scientific and technical achievements of the communication industry won the "Scientific and Technical Awards of Information Science of the Chinese Institute of Electronics" and the "Scientific and technical Awards of the Chinese Institute of Communication".

4.International cooperation and foreign trade

（1），Import and export

According to statistics of China Customs, the communication equipment export value in 2005 hits US$43.363 billion, up 45.85% on a year-on-year basis, accounting for 19.8% of the total export value of the electronics and information products, 5.5 percentage points higher than that of the previous year. The communication equipment import value hits US$16.028 billion, up 15.32%, accounting for 7.26% of the total import value of the electronics and information products. The growth rate was lower than that 2004.

The export of products with high technical content increased significantly in 2005. The export value of mobile phone increased by 45%, that of the switchboards increased by 24.9%; and that of the optical transmission equipment increased by 112.7%. All the export growth rates of major communication products were much higher than that of 2004. The significant growth of the export value was a result of the international information industry restructuring and the rapid development of the telecom industry of China. It also indicated that the industry upgrade of the communication equipment manufacturing industry has produced results while the "going global" strategy implemented by the central government yielded effect.

（2），Participating in international competition

In 2005, the communication equipment manufacturing industry of China continuously expanded the overseas market on the basis of participating in the international competition in 2004 and embarked on a scalized stage. The industry witnessed constant increase of technical content in the products, many fields reaching the world leading level, customer group expanded to the developed countries and significant increase of sales value.

ZTE Corporation. ZTE's wireless product application of CDMA, GSM, PHS, 3G GCDMA2000 and 3G WCDMA exceeded 150 million lines in total in the market home and abroad. In November 2005, the World Summit on the Information Society was held in Tunis and ZTE supplied the latest 3G mobile communication service for the Summit. In December of the same year, ZTE started to supply 3G mobile phone to the UK market and then get access to the world's cutting edge arena of 3G. Currently ZTE has set up nearly 200 NGN commercial networks in China, the US, Pakistan, Mongolia and Philippine and the total designed capacity of the network system exceeded 30million lines. It has set up 14 business platforms in the overseas markets and established business ties with more than 500 operators from over 100 countries and regions.

Huawei Technologies Co. Ltd. Huawei boasts a global marketing and service network to offer prompt and high quality services for customers across the world. Currently Huawei's products and solutions have been employed by 28 operators of the Top 50 operators of the world, serving more than 1 billion users in the world. In 2005, Huawei obtained 29 WCDMA commercial networks in the world; its GSM products have been employed in more than 80 countries for commercial purposes to a certain scale, serving 120 million of subscribers. Its CDMA network has served 40 million of subscribers of the world and it has obtained 19 CDMA2000 1xEV-DO commercial contracts; Huawei served more than 10 million of users with the CDMA softswitch network and built the largest CDMA softswitch network of the world in Pakistan; it has set up more than 100 networks of mobile softswitch in more than 60 countries, serving more than 100 million of users across the world; it ranked the second position in the optical network market in terms of the market share and the first position in the long-distance wave division multiplexing market. it has secured the largest market share in the Asia-Pacific optical network market for five years in a row;

totaling more than 410,000 sets of OptiX optical network products have been employed in the world with scalized application in more than 80 countries and regions; Huawei took the largest market share in the global market in terms of the NGN, reaching 27.68% and the sales volume reached 28 million ports; the shipment of the wireless terminals including 3G mobile phone, 3G data card and CDMA mobile phone exceeded 10 million sets in the global market and have been used for commercial purpose to a certain scale in the mainstream mobile markets such as Europe and Asia-Pacific. Huawei has become the largest wireless terminal manufacturer of China.

Wuhan Research Institute of Post and Telecommunication. The Institute attaches importance to the overseas market and builds Fiberhome brand in the global market via product export, project contracting, joint venture production and joint operation. With establishment of the international marketing system, a series of products are exported to more than 20 countries and regions such as the US, Canada, Italy, Netherlands and Switzerland; the high-end DWDM system has been exported to the Silicon Valley of the US; it has undertaken construction of the state-level power grid trunk line of Indonesia, the state-level trunk line of the natural gas trunk line of India, the state-level telecom trunk line of Burma, the state-level trunk line of national defense of Burma, the state-level trunk line of the railway department of Iran and the state-level telecom trunk line of Bhutan and so on. More than 60% of the optical and photoelectric products are exported and occupy a certain market share in the North American, European and Southeast Asian markets.

In a word, the communication equipment manufacturing of China has gradually entered into the international market to compete with the overseas counterparts under the "going global" strategy of the Chinese government.

5.Market prospect

In 2005, the production size and output of the mobile communication products have been significantly increased driven by the rapid development of the telecom industry and the mobile communication product industry became one of the pillar industries of the electronic and information industry. The others such as the optical communication products, network equipment, access equipment and trunking equipment have also greatly developed.

（1），Mobile communication industry

Product sale: In 2005, China has produced 307 million handsets, up 31.8% on a year-on-year basis; of which, 304million handsets were distributed, increased by 32.2%; of which 228 million handsets were exported, up 56.2%. The export value hits US$20.66 billion, up 46.0%. In the same year, 7.25 million channels of mobile base stations were sold, up 69.4%. The total handset output of the year accounted for 36.8% of the total output of the world. China became the largest handset production base of the world with the production capacity exceeding 350 million sets.

Market development and features: In 2005, a new turn of structure change happened in the handset market. First of all, the foreign-funded enterprises increased their market share in China. Relying on the strong capital and technical strength, the foreign brand handset manufacturers speeded up new product release to occupy the market on the one hand after completely getting acquaintance with the situation of the local market, and offered products covering the high-end, medium-end and lower-end markets and enforced competition with the local manufacturers in the medium-end and lower-end market. In 2005, the foreign-funded enterprises occupied 59.4% of the handset market of China, 3.9 percentage points higher than that of 2004. Secondly, the local handset manufacturers' market share was declining. In 2005, the local brand handset manufacturers gradually lost their original competitive advantages and the growth momentum. The main reasons lie on the capital and technical defects that constrain development of the enterprises when the original competitive advantages on the channels, price and acquaintance of the local market are weakening. In addition, the facts that the enterprises' fast expansion, laggard new handset model release, too many product quality problems and profit declining even losses made the local brand handset manufacturers' market share declined from 44.5% in 2004 to 40.6% in 2005. See Figure 1 for the Top 3 handset manufacturers' market share between 2003 and 2005. Thirdly, the production concentration is further increased with enlarged production scale and production congregating to the dominant enterprises. Take the handset industry of China for example. The total output of Top 10 manufacturers accounted for 72.9% of the total in 2004 and the sales volume accounted for 72.8% of the total. In 2005, if calculated on the same indexes, the total output of the Top 10 enterprises accounted for 78.7% while the sales accounted for 78.4%. Fourthly, the competition in

the local brand handset market is fierce. On the one hand, the raw materials, power and labor costs are increasing; on the other hand, the structural and stage overplus of handsets make the market price of China-made handsets to continue a decreasing trend and the profits are continuously squeezed. The foreign-funded enterprises continuously enforce development of the lower-end market, which will certainly squeeze the market share of local brands and the competition between the handset manufacturers of local brands will be even fierce.

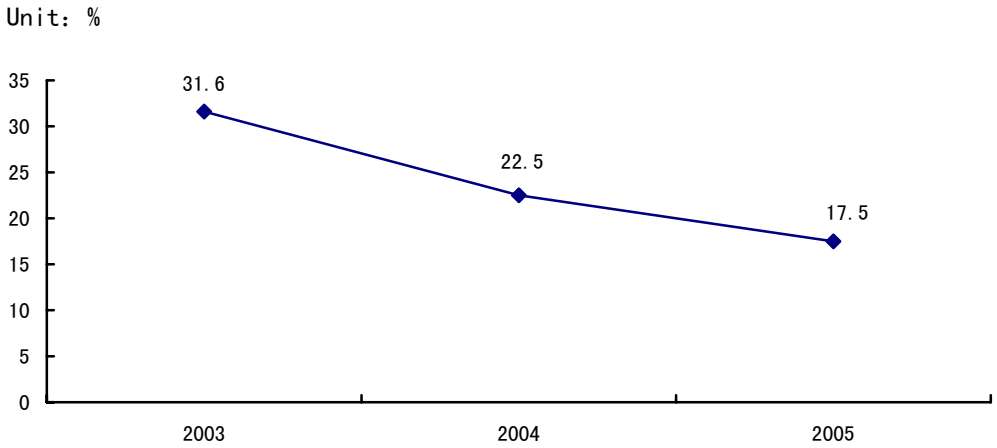


Figure 1: Market share of Top 3 local brand handset manufacturers in the Chinese market between 2003 and 2005.

(2),

Optical communication industry

Product sale: In 2005, the optical communication industry recovers and maintains a stable growth. The rapid growth of the broadband data business, VoIP and multi-media data business and the increasing demand from the dedicated power networks such as the power network and petroleum network stimulated recovery of the optical communication industry. In 2005, the optical cable consumption increased by 1.40million core-km on a year-on-year basis, hitting 17.40 million core-km. Because of the price lowering, the market size decreased by 370 million yuan on a year-on-year basis to 3.31 billion yuan. The optical fiber production capacity exceeds the market demand and the whole industry is facing challenges. The optical network equipment gradually becomes a development force with building of the broadband sector. The market reaches 13.8 billion yuan, up 8.9%. The Chinese communication enterprises best represented by Huawei, ZTE and Wuhan FiberHome Technologies Group have become strong challenges of the foreign

manufacturers that had monopolized the optical communication market of China. Currently several production bases of the optical device industry have been established in China with about 10 optical device manufacturers. The total output value of the active optical devices and passive optical devices was about 3 billion yuan.

Market development and features: In terms of the optical fiber and optical cable, the production is overcapacity and the supply exceeds demand. The optical fiber and optical cable production can meet the local demand. However, the special optical fiber such as the optical fiber for the FTTH still needs import although the total import is not large. The optical fiber pre-form that controls the optical fiber is the core technology with high profits. As the Chinese manufacturers of optical fiber pre-form are still left behind by the foreign counterparts, the import volume is still large. In addition, the Chinese optical fiber and optical cable have limited competitiveness in the international market as these products have nearly lost the price advantages in the international market and the costs can hardly be reduced . The export is small.

In terms of the optical communication equipment and system, the local production is overcapacity and the supply exceeds demand. The China-made optical communication equipment and system prices are much lower than that of the international market, thus the local manufacturers enjoy price advantages. Especially in the lower-end product market, the Chinese manufacturers have occupied 36% of the global market. The China-made optical communication equipment and system account for 12% of the global market.

On the optical devices, the passive optical device sector is overcapacity and the supply exceeds demand. The export is relative large, especially the lower-end products such as the optical fiber connector, coupler and optical filter. Currently, China has become a world OEM of the passive optical devices. However, the raw materials or core component of the passive optical devices still need import, for example, the filter for the optical filter. The active optical device sector is overcapacity too. In this field, some products are exported. In terms of the lower-end optical devices, the chip production has been localized; however, the chips used in the electron device are imported. The high-end optical devices are completely depending on import.

（3），Network equipment (server, router Ethernet exchanger)

Product sale: In 2005, the server market of China maintains a rapid growth trend with the total market reaching 17.389 billion yuan, up 22.3%; the sales hits 447,200 sets. Of which, the sales value of PC servers accounts for 48.2% of the total with sales revenue reaching 8.389 billion yuan, up 17.16%; the sales volume reaches 427,000 sets, up 22.7%. The sales value of RISC servers accounts for 51.8% of the total sales and the sales revenue hits 9 billion yuan, up 5.14%; totaling 20,200 sets are sold, up 13.48%. See Table 3 for data of the server market of China between 2004 and 2005.

In 2005, totaling 353,000 sets of routers are sold, up 14.61%; the sales value reaches 7.86billion yuan, increased by 12.13%. Although the growth speed has slowed down compared with that of 2004, the sector still maintains a double-digit growth. See Figure 2 for the distribution data of the router market of China between 2003 and 2005. See Figure 3 for the sales revenue of router market of China between 2003 and 2005.

In 2005, the total sales volume of Ethernet exchangers hits 20.555 million ports, up 12.4% on a year-on-year basis; the sales value reaches 8.38 billion yuan, increased by 12.3%. See Figure 4 for the distribution data of Ethernet exchanger market between 2003 and 2005. See Figure 5 for the sales growth of Ethernet exchanger of China between 2002 and 2005. See Figure 6 for the sales revenue of Ethernet exchangers between 2002 and 2005. See Figure 7 for the sales revenue growth of Ethernet exchanger of China between 2002 and 2005.

Market development and features: First of all, the medium- and lower-end market demand drives the overall market to grow rapidly. In 2005, the network equipment market grows rapidly, especially the rapid growth of demand on the medium- and lower-end products, enabling the network equipment market a notable growth. Secondly, new products and new technologies emerge in endlessly. The fast popularization of 64-bit algorithm becomes a highlight of the network equipment sector. Since 2004 IA trunking systems have been widely adopted in the commercial computer and information service field; the application of blade products which features performance of a server has kicked off. Thirdly, the market competition among the home and foreign brands are increasingly fierce. In 2005, the medium- and lower-end products regained the core position in the Chinese network equipment market and the international brands' market

strategy is to extend the product lines from the high-end to the lower-end. Fourthly, the users tend to become reasonable on the product procurement and raise higher requirements on the network equipment application. In 2005, the competition of network equipment market mainly focus on the service value and customizing network equipment for the clients become a trend. Fifthly, the distribution channel is diversified.

6.Development trend

In 2006, the communication industry will enjoy a sound development environment and the communication equipment manufacturing industry will develop rapidly and harmoniously in a sustainable way.

It is expected that the sales revenues of the communication equipment manufacturing industry will hits 827.8 billion yuan, up 35%; the industrial increment value increases by 30%, or reaching 191.4 billion yuan; the total pre-tax profits hits 41.6 billion yuan, up 20%. The export value realizes 30% of growth, i.e. reaching US$56.3 billion. The development trends: first of all, the new technologies and new businesses will drive development of the manufacturing industry. The 3G system will enter into a start-up stage and the value-added business will play a critical role in the communication market. The wireless data service will become a new momentum driving the communication market in 2006. The data communication will become a new growth point. In addition, NGN and WiMax will grow significantly. The complex competition structure of Chinese telecom players, the network security and terminals will confuse development of NGN. The soft exchange and NGN technologies are not mature yet in China. If developing the NGN in accordance with the actual situation of China, the operators shall coordinate with the manufacturers to drive the whole market together. The year of 2006 will be a critical year for the NGN to develop in China. It is expected that China will witness a peak of building NGN network three years later. Compared with the wireless LAN, WiMax supports a wider coverage, higher speed and multimedia businesses. In terms of the technical development, WiMax and 3G system will supplement with each other: 3G system offers voice services and relative lower speed data access while Mbit/s high-speed data access service is offered by WiMax. Secondly, the industry

concentration is becoming higher. Thirdly, the foreign-funded enterprises still will occupy half of the market. Fourthly, the structural conflict will continuously upset the communication equipment manufacturing industry.

【Statistics data】

Table 1 Award-winning projects submitted by the Ministry of Information Industry in 2005

Award-winning project	Prize	Winner
Broadband Wireless Network WAPI Security Technology	Second grade of the National Technological Invention Award	Zhang Bianling, Wang Yumin, Huang Zhenhai, Guo Hong, Tie Manxia, Li Dawei
Practical TFF DWDM Device	Second grade of National Scientific and Technological Progress Award	Xu Yuanzhong, Hu Qianggao, Ma Kun, Xiao Qingming, Liu Jun, Li Chuanwen, Fang Luozhen, Liu Shuihua, Xie Jing, Liu Qiuhua
IPV6 Core Router	Second grade of National Scientific and Technological Progress Award	Wu Jianping, Xu Mingwei, Zhao Youjian, Xu Ke, Fu Lizheng, Yin Xia, Zhang Xiaoping, Bi Jun, Cui Yong, Li Zhao

Table 2 Award-winning projects submitted by other units of the information industry in 2005

Award-winning project	Prize	Winner
Time-Domain Synchronous-Orthogonal Frequency Division Multiplexing （TDS-OFDM）	Second grade of the National Technological Invention Award	Yang Zhixing, Tsinghua University
Technical Research on Preparing and Mass Production of Non-Zero Dispersion Shifted	Second grade of National Scientific and Technological Progress Award	Zhang Shuqiang et al, Yangtze Optical Fibre and Cable Company

Single-Mode Optical Fiber with PCVA Processing		
U-SYS Technology with Soft Exchange as Core	Second grade of National Scientific and Technological Progress Award	Zhang Hongbin, Huawei Technologies Co. Ltd.

Table 3 Server market size of China between 2004 and 2005

Item / year	2004	2005	Growth rate（%）
Sales volume (10,000sets)	36.58	44.72	22.25
Sales value (100 million yuan)	157.22	173.89	10.60

Table 4 Sales of electronic and communication products between 2003 and 2005

Product name	Unit	2003		2004		2005	
		Sales volume	Growth rate(%)	Sales volume	Growth rate（%）	Sales volume	Growth rate（%）
Handset (GSM, CDMA)	10,000 sets	18326	54.2	23345	27.4	30354	30.0
PHS	10,000 sets	1412		2632	86.4	1633	-38.0
Program controlled exchanger (excluding mobile exchanger)	10,000 lines	5793	45.2	7629	32.0	7721	1.3
Equipment of mobile base station	10,000 channels	307	-40.6	440	43.3	725	69.4
Telephone set	10,000 sets	12316	35.6	13960	13.3	16954	21.4

Fax machine	10,000 sets			1380		1068	-22.6

Remarks: data from the Ministry of Information Industry

Table 5 Sales of the electronic and communication products between 2003 and 2005

Product	Unit	2003		2004		2005	
		Sales revenue	Growth rate（%）	Sales revenue	Growth rate（%）	Sales revenue	Growth rate（%）
Electronic and communication products	10,000 yuan	3389.2	53.91	4727.6	39.48	6132.0	29.70

Remarks: data from the Ministry of Information Industry

Table 6 Import & Export of main electronic and communication products between 2003 and 2005

Product	Unit	2003		2004		2005	
		Export value	Import value	Export value	Import value	Export value	Import value
Telephone set in total	US$10,000	166575	2648	197681	4560	212496	5753
Fax machine	US$10,000	50972	17453.4	56002	17990	46479	15345
Program controlled exchangers	US$10,000	45288	6338	106237	3005	132642	7750
Ethernet network exchanger	US$10,000	23498	39925	33029	45319	52396	44725
Handy (vehicle-board) wireless phone	US$10,000	737703	281308	1416581	147400	2066233	119779

sets							
Interphone	US$10,000	26372	1496	31848	1604	28627	4097
Mobile communication base station	US$10,000	51185	18878	114976	9548	131733	3208
Optical communication equipment	US$10,000	11467	11268	19269	8828	40979	4833

Remarks: data from China Customs

Table 7 Import of main electronic and communication products between 2003 and 2005

Product	Unit	2003		2004		2005	
		Import volume	Growth rate（%）	Import volume	Growth rate（%）	Import volume	Growth rate（%）
Telephone set in total	10,000 sets	111.03	-7.4	150.67	35.7	166.60	10.6
Fax machine	10,000 sets	138.99	76.3	166.57	19.8	158.38	-4.8
Program controlled exchangers	10,000 sets	2.07	21.8	1.34	-35.3	1.57	17.2
Ethernet network exchanger	10,000 sets	44.42	-5.9	49.39	11.2	66.64	34.8
Handy (vehicle-board) wireless phone sets	10,000 sets	2206.61	28.3	1272.34	-42.3	1275.16	0.2
Interphone	10,000 sets	14.80	213.6	27.58	86.4	25.25	-8.4

Mobile communication base station	10,000 sets	1.37	57.5	0.71	-48.2	0.23	-67.6
Optical communication equipment	10,000 sets	3.34	5.4	3.22	-3.5	14.20	341.0

Remarks: data from China Customs

Table 8 Export of main electronic and communication products between 2003 and 2005

Product	Unit	2003		2004		2005	
		Export volume	Growth rate（%）	Export volume	Growth rate（%）	Export volume	Growth rate（%）
Telephone set in total	10,000 sets	19323.70	14.5	19904.60	3.0	19845.1	-0.3
Fax machine	10,000 sets	413.73	-1.9	551.29	33.4	548.6	-0.5
Program controlled exchangers	10,000 sets	14.72	279.4	19.05	29.4	16.9	-11.2
Ethernet network exchanger	10,000 sets	312.08	151.6	613.52	96.5	757.4	23.5
Handy (vehicle-board) wireless phone sets	10,000 sets	9534.31	50.6	14604.60	53.2	22830.0	56.3
Interphone	10,000 sets	2653.40	33.5	2818.72	6.2	2376.7	-15.7
Mobile	10,000	1.93	3.2	3.73	93.3	5.8	55.5

communication base station	sets						
Optical communication equipment	10,000 sets	1.88	-23.6	16.44	769.1	13.2	-19.7

Remarks: data from China Customs

Table 9 Completion of main economic indexes of communication product manufacturing industry between 2003 and 2005

Project	Unit	2003	2004	2005	Growth rate（%）
Industrial increment value of all industries	100 million yuan	4000	5650	9004	50.0
Inc.: Industrial increment value of the industry	100 million yuan	823	1074	1472	33.7
Sales revenue of all industries	100 million yuan	18800	26531	38411	42.9
Inc.: Sales revenue of the industry	100 million yuan	3389	4382	6132	34.5
Pre-tax profits of all industries	100 million yuan	1038	1500	1742	29.5
Inc.: pre-tax profits of the industry	100 million yuan	233	383	347	22.0
Exports of all industries	US$100 million	1421	2074	2681	37.4
Inc.: export of the industry	US$100 million	173	297	433	58.2

Remarks: data from the Ministry of Information Industry

II. Radio & television equipment industry

1.General introduction

In 2005, the radio & television equipment industry develops soundly and all economic indexes grow simultaneously in an all-round way. The year of 2005 is the last year of the 10th Five Year Plan period. Comparing with the first year of the 10th Five Year Plan period (2001), the radio & television equipment industry has realized 1.5 times of growth of the gross industrial value (current price); the industrial increment value up 88%, the sales revenue increased by 1.6 times and the pre-tax profit up 37.4%. The radio & television equipment industry enjoys great development in the 10th Five Year Plan period and contributes to the undertaking of meeting the increasing material and spiritual living standards and developing the national economy and social informatization.

According to the economic statistics of China Radio & TV Equipment Industry Association, the net fixed assets of the radio & television equipment industry reaches 2,813,160,000 yuan in 2005, up 12.9% on a year-on-year basis; the practitioners reaches 28,865 persons by the end of the year, reduced by 3.3%. China Radio & TV Equipment Industry Association has 132 member enterprises. Of which, seven are medium wave broadcasting transmitter manufacturers, two are short wave broadcasting transmitter manufacturers and 18 frequency modulation transmitter manufacturers; 11 enterprises are 1kW and above meter wave TV transmitter manufacturers; 8 enterprises are lkW and above deci-meter wave TV transmitter manufacturers; 9 enterprises are meter wave TV transmitter and transposer manufacturers below 1kW; 8 enterprises are deci-meter wave TV transmitter and transposer manufacturers below 1kW; 24 enterprises are manufacturers of cable TV and network engineering equipment; 6 enterprises are application TV equipment manufacturers; 11 enterprises are audio and video program production, broadcasting control and lighting equipment manufacturers; 6 enterprises are satellite receiving equipment manufacturer and 17 radio and TV peripheral equipment manufacturers.

2.Production and sale

The statistics of main economic indexes made by China Radio & TV Equipment Industry Association shows: in 2005, the gross industry output value (current price) hits 8,989,760,000 yuan, up 17.7%. Of which, the radio & TV equipment industry gross industry output value (current value) hits 4,137,870,000 yuan, up 39.7%; the export delivery value 1,809,500,000 yuan, up 34.6%. Of which, the radio &TV equipment export delivery value is 919,710,000 yuan, up 85.3%; the industrial increment value is 2,347,100,000 yuan, up 18.3%. Of which, the radio &TV industrial increment value reaches 765,150,000 yuan, up 31.2%; the sales revenue reaches 9,236,960,000 yuan, up 23.4%. Of which, the sales revenue of the radio & TV equipment is 4,277,920,000 yuan, up 45.5%; the gross pre-tax profits reach 269,270,000 yuan, up 4.7%; the total profits reach 678,120,000 yuan, up 15.4%. See Table 1 for completion of the main economic indexes of the radio &TV equipment industry between 2004 and 2005. See Table 2 for the output and sales of the radio and TV equipment in 2005.

【Statistics data】

Table 1 Completion of main economic indexes of the radio &TV equipment industry between 2004 and 2005

Serial number	Index	Unit	2004	2005	Growth rate （%）
1	Gross industry output value (current price)	10,000 yuan	763768.0	898976.0	17.7
	Inc.: gross industry output value of the industry (current price)	10,000 yuan	296103.0	413787.0	39.7
2	Export delivery value	10,000 yuan	134418.0	180950.0	34.6
	Inc.: export delivery value of the industry	10,000 yuan	49634.0	91971.0	85.3
3	Industrial increment value	10,000	198458.0	234710.0	18.3

		yuan			
	Inc.: industrial increment value of the industry	10,000 yuan	58300.0	76515.0	31.2
4	Product sales revenue	10,000 yuan	748291.0	923696.0	23.4
	Inc.: product sales revenue of the industry	10,000 yuan	293952.0	427792.0	45.5
5	Total taxes	10,000 yuan	25723.0	26927.0	4.7
6	Total profits	10,000 yuan	58781.0	67812.0	15.4

Remarks: "the industry" in the table means the radio &TV equipment industry. The number of manufacturers submitted to the Association is variable.

Table 2 Product output and sales of the radio &TV equipment industry in 2005

Serial number	Product name	Output (set)	Growth rate （%）	Output (set)	Growth rate （%）	Sales revenue (10,000 yuan)	Growth rate （%）
1	Medium wave radio transmitter	537	14.5	561	2.0	4937	12.7
	Short wave radio transmitter	31	-20.5	31	-18.4	6318	-25.6
	Frequency modulation radio transmitter	3367	-2.7	3105	-18.3	6690	-20.3
2	VHF 1kW above TV transmitter	405	55.8	371	57.9	6342	51.1
	UHF 1kW above TV	268	-3.6	250	14.2	6517	2.9

	transmitter						
	V1kW blow TV transmitter, transposer	4978	390	4945	431.2	2146	78.5
	U1kW below TV transmitter, transposer	117	36.1	114	54.1	1096	291.4
3	Cable TV equipment					241859	32.1
4	Application TV equipment					29750	27.7
5	Audio & video program production and broadcasting control and lighting equipment					43334	51.5

III. Consumable electronics industry

1.General introduction

In 2005, the consumable electronics industry (mainly referring to the home video and audio products) maintains a good growth momentum and realizes a delightful profit growth of 357.1% on a year-on-year basis. The industry increment value of the home video and audio equipment manufacturing industry reaches 67.5 billion yuan, up 8.5% on a year-on-year basis; the product sales revenue reaches 374.9 billion yuan, up 7.1%; the total profits reaches 6.4 billion yuan, up 357.1%; the paid-in taxes reach 4.8 billion yuan, increased by 23.1%. According to the incomplete statistics, 2,617 enterprises involve in TV set, radio, radio-recorder, video recorder, camcorder, digital laser player and acoustics equipment manufacturing. Especially in the flat panel TV set manufacturing sector, a number of new enterprises emerged.

2.Production and sale

（1），TV set. In 2005, totaling 91.25 million TV sets are produced, up 5.9%; 90.70 million sets

are distributed, up 6.4%. Of which, 8.42 million black-and-white TV sets are produced, decreased by 34.4%; the sales volume is 8.83 million sets, down 30.5%. The output of color TV set is 82.83 million sets, up 13.0%; 81.87 million sets are sold, up 12.8%. In terms of the color TV set production, sales and export beginning from 2000, the industry's growth rate started to decline from the year of 2003 but still maintains a double-digit growth, outliving the industry adjustment. See Figure 1 for the TV set production of China between 2001 and 2005.

In 2005, the annual output of 12 color TV manufacturers exceeds 1 million sets and the total production of these enterprises reaches 77.93 million set, accounting for 94.1% of the total output of the industry; six manufacturers' annual output exceeds 5 million sets and the total output of them reaches 64.77 million sets, accounting for 78.2% of the total. The production concentration and brand concentration of the industry are further enhanced. As of 2005, 600 million color TV sets are produced in China and 440 million sets are in service.

In 2005, the flat panel TV sector develops rapidly and 10 million sets of PDP and LCD TVs are produced, accounting for 12% of the total production of color TV; 860,000 sets of rear projection TV sets are produced, decreased by 23.9%; the sales volume reaches 980,000 sets.

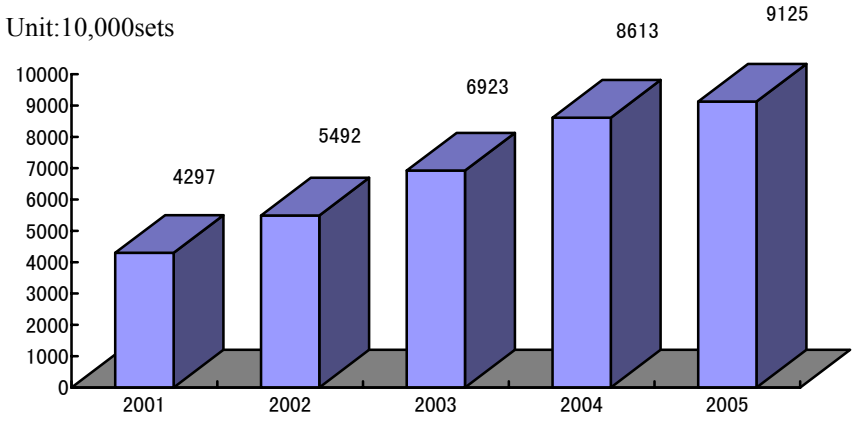


Figure 1: TV production of China between 2001 and 2005

With more than 20 years of development, China has become the largest manufacturer and seller of color TV of the world. In 2005, the color TV industry of China accounts for over 45% of the total output, and 54.6% of the total sales of the world. Currently the color TV industry has entered into

a new historic revolution stage. The demand on the CRT color TV has slowed down while the new type flat panel TV sector comes to an expansion period. Under such a situation, the color TV enterprises overcame the adverse factors such as the price rising of the raw materials, coal, electric power and petroleum, short supply of transport, reduced export tariff refund, rising labor costs and anti-dumping efforts of the overseas market, adjusted the product structure, reduced production and operation costs, and expanded new international and domestic markets. By doing so, the color TV sector maintains a stable growth momentum and makes great achievements.

（2），Digital laser player (including VCD, DVD player). In 2005, the VCD and DVD player output reaches 200.18 million sets, up 3.4% on a year-on-year basis; 183.60 million sets are sold in the year. The DVD disc recorder output reaches 16.96 million sets, up 77.4% while the output of optical heads of VCD player and DVD player reaches 587.55 million pieces, decreased by 5.2%; 587.55 million pieces are sold in the year, decreased by 5%. The output of VCD and DVD player cores reaches 200 million pieces, up 3%; 200 million pieces are sold, up 3%. See Figure 2 for the VCD and DVD player production between 2003 and 2005.

（3），Acoustics products. In 2005, both the output and sales of the acoustics products are quite good. The output of radio reaches 284.60 million sets, reduced by 18.7%; 282.60 million sets are sold, down 19.3%. The output of recorders (including radio-recorders) reaches 181.81 million sets, up 11.2%; 178.30 million sets are sold, up 9.1%. The output of set acoustics equipment reaches 86.03 million sets, up 5.9%; 81.03million sets are sold, basically equal to that of the previous year. The output of home theaters (referring to the sound system of the home theater) reaches 26.23 million sets, up 234.1%; 24.73 million sets are sold, up 215.0%. The output of CD players reaches 67.73 million sets, down 18.0%; 67.73 million sets are sold, reduced by 18.0%. The output of electronic organ reaches 5.50 million sets, up 13.2%; 5.50 million sets are sold, up 13.2%. The output of vehicle acoustics equipment reaches 34.88 million sets; 34.88 million sets are sold. The output of MP3 reaches 20.14 million sets; 20.14 million sets are sold.

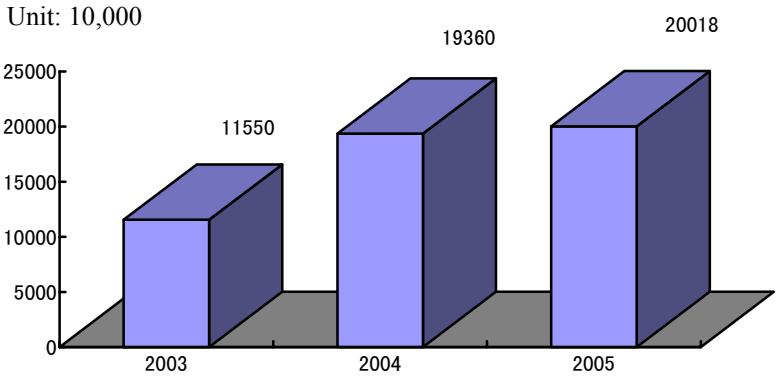


Figure 2 Production of VCD and DVD equipment between 2003 and 2005

3.Scientific research and new products

（1），Formulate standards with support from the governments and participation of enterprises

In February 2005, the Ministry of Information Industry declared to make the new generation high definition red ray disc decoder standard (hereinafter referred to as EVD) as the recommended standards of the electronics industry. Currently some enterprises have released products with EVD standards to the market and some even release the digital film player meeting the EVD technical standard, driving development of the digital film of China. Following the EVD standards, the universities, research institutes and enterprises that have the capability of development invested in the products with high capacity and better definition and made progresses in the aspect.

In June 2005, the Intelligent Grouping Resource Sharing (i.e. IGRS) initiated by Lenovo Holdings Co. Ltd. and the Platform of Home Network (i.e. E-home) initiated by Haier Group were nominated the recommended industry standards by the Ministry of Information Industry. Although these two standards are not compatible with each other, the release of these standards will certainly enhance development of the digital network industry of China. The development of these standards is subject to the comprehensive strategies of them in the market competition.

The digital audio and video compressing technology is the basic technology of the digital audio and video field. Therefore, formulating the digital coding compressing standards is of strategic

significance. In June 2002, the research institutes and relevant enterprises of China set up the AVS working team in Beijing. In December 2003, the working team completed the draft of video section of AVS Standard for review. The relevant procedure of testing the standards and the standard review and approval was gone through between 2004 and 2005. By the end of 2005, the Ministry of Information Industry has solicited opinions from the relevant departments and bureaus on the AVS standards and completed the replied draft of the video section of AVS standards on the basis. In 2005, some IC designing companies have designed AVS decoding chips and have made delightful achievements. The AVS101 HD decoding chip won the title of Top 10 Technical Innovation Products of Zhongguancun; while the AVS standard is formulating, the backbone enterprises and institutional units of the audio and video sector set up the AVS Industry Alliance in May 2005. The establishment of the industry alliance indicates the formal launch of the AVS industrialization and the alliance members develop and employ AVS technical products to expand the application fields.

In 2005, the formulation of relevant standards of the digital TV receiving equipment, including the digital TV displayer, STB and machine-card separation, was under preparation and the application tests are conducted smoothly. Of which, 25 electronics industry standards such as the Glossary of the Digital TV Receiving Equipment are completed for release.

（2），Color TV products

Increase investment in the R&D. Under the situation of product homogeneity of domestic color TV manufacturers and fierce market competition, the set-equipment enterprises have followed up the international advanced technologies and enforce independent development of new products, speed up efforts of tackling the scientific difficulties and development of new products of HD TV and flat panel TV that meet the color TV development trend. Several major color TV manufacturers invested more than 100 million yuan in the research and development.

In 2005, Hisense Group developed the Xinxin chip used for image processing. Now the chip has been widely used in the TV receivers such as the CRT TV, LCD TV and PDP TV and performed very well, ending the history that China completely depended on import for the core chip used in the color TV production. Haier Group has stuck to development of MPEC-2 and succeeded. In

2005, the sales volume of the chips exceeds 10 million pieces.

（3），Rear projection TV product

In 2005, the output and sales volume of rear projection color TV are reduced. The rear project color TV using projection CRT has reduced sharply while the rear projection TV using LCD and DLP has increased slightly. Some backbone color TV manufacturers of China gradually reduced investment in the rear projection color TV using projection CRT and turned to the development and production of rear projection color TV using the micro-display technologies such as LCD, DLP and LCOS. The enterprises and rear projection manufacturers enforced research and development of the projector using LCOS technology and input big money and manpower in the micro-display technology. Of which, some enterprises set up optical micro-display technology research institute and some enterprises focus on development of the key component of the rear projection TV, optical engine. Currently some enterprises have released three-chip and single-chip LCOS rear projection TV to the market.

（4），Front projection product

In 2005, the front projector market still maintains a relative high growth momentum. The group consumption demand is hot, especially the development of digital film leads to sharp increase of demand on the front projectors. Therefore, some enterprises turned to development of front projectors. Some enterprises have invested heavily in the development of key components. They design the optical engine independently and produce the front projector with independent brand employing the key components developed by them. The product is well received in the market and performs as good as the foreign brands that secured the leading position in the market for years.

（5），Digital TV industry

In 2005, the terrestrial transmission standards of digital TV have not been finalized yet and the backbone enterprises are engaging in development of digital TV products. First of all, they develop products according to the overseas market while follow up the formulation of standards of China. Secondly, they are preparing for the product development. Targeting at the ATSC format of the US market and DVB format of the European market, they have developed digital TV receivers and exported to the overseas markets; thirdly, the Chinese enterprises developed various products

according to different demands on the digital cable TV for the cable TV operators; fourthly, as the digital terrestrial TV standards are not finalized, the industry is making preparation for development while following up the foreign technologies; fifthly, some enterprises have developed IPTV application software, front-end products and STB for the IPTV industry. Currently, these products have been employed in the IPTV network of Hangzhou, Shanghai and Harbin etc.

（6），Digital laser player and key components

In 2005, the common DVD player market capacity home and abroad grows steadily. The Chinese enterprises enforce R&D of new generation of products while producing DVD players and DVD recorders. The enterprises, research institutes and universities continue research of disc products with higher capacity and definition using the red ray technology. They have developed optical heads and small cores for the new generation products using the AVS chip design system developed independently in China.

Progresses have been made in the development and production of key components of the digital laser player. The optical heads of DVD players have been put into mass production and the suction-in core with relative high technical performance has also been put into mass production. The multi-dimensional torquer and photoelectric converter which are difficult to develop are still under development.

Following the DVD products employing the red ray technology, the blue-ray product becomes the development orientation of the disc industry. Currently the blue-ray products fall into two different formats, BD format and HD-DVD format. Constrained by the capital and technical strength, the Chinese enterprises have not invested much in the blue-ray technology and products.

（7），Acoustics products

The acoustics product market home and abroad is still in a growth stage. In 2005, affected by the entertainment requirement individualization and outstanding performance/price ratio of portable acoustic entertainment consumable electronic products such as the MP3, music handset and PMP, the performance of the domestic set acoustic product market declined slightly. Facing the competition situation of the consumer group differentiation, the industry started to discuss how to

combine the set acoustics equipment with the digital TV and develop TV theatre. In 2005, the industry has made progresses in the amplifier using the digital technology. Some research units developed the digital amplifier chip and put the product into mass production. And the digital amplifier products have been released to the market. In a word, with more than 20 years of rapid development of the acoustics industry, an inflexion has occurred in the acoustics equipment market. To shake off the recession, the digital technology must be employed to increase development of new products and rejuvenate the acoustics industry of China.

4. International and domestic cooperation and foreign trade

Product export. In 2005, 39.75 million sets of color TV are exported, up 43.4%; the export value reaches US$5,050,845,200, up 57.6%. Of which, CRT color TV export reaches 25.64 million sets with export value reaching US$2,230,162,000, decreased by 1.6%. The LCD color TV export volume reaches 7.29 million sets with export value reaching US$2,102,793,000, increased by 238.0%; 240,000 sets of plasma LCD color TV are exported with export value reaching US$287.04 million, up 91.8%. What needs to be pointed out is that the export volume of the flat panel TV accounts for 19.0% of the total export while the export value accounts for 47.3% of the total export value. In 2005, exporting a flat panel TV equals to exporting 3.6 sets of CRT color TV on the export value. That the export of color TV sector recovers quickly is the result of color TV enterprises' constant expansion of the international market. TCL Group has set up distribution companies or offices in over 10 countries and regions and established production bases of color TV in Vietnam and India, laying a foundation for its internationalization. Konka Group has exported the color TV to more than 60 countries and regions such as Australia, India and Russia. The other enterprises expedited their paces of expanding the international market and set up factories or hold or participate in the international exhibitions in Russia, East Europe and Africa. All these measures enforced exchange and cooperation between the Chinese color TV industry and the foreign counterpart and broke the limitation of the new international trade protectionism to the color TV export of China.

In 2005, the radio-recorder export volume reaches 180.73 million sets, decreased by 14.3%; the

export value reaches US$7,145,100,000. The laser player export volume reaches 173.14 million sets, equaling to that of the previous year while the export value reaching US$7,333,380,000. The export volume of radio reaches 272.60 million sets, decreased by 10.9%; the export value is US$423.64 million. The export of laser phonograph reaches 57.73 million sets with the export value reaching US$670.55 million. The vehicle acoustic export volume is 29.27 million sets, up 8.2%; the export value reaches US$1,074,870,000. The professional acoustics equipment export volume is 23.21 million sets with the export value reaching US$661.87 million. The electronic organ export volume reaches 4.80 million sets while the export value reaches US$208.16 million. The laser player core export volume reaches 20.88 million sets while the export value reaches US803.46million. The MP3 player export volume reaches 13.92 million sets.

International and domestic cooperation. In 2005, the color TV enterprises of China saw a new turn of competition and merger. The color TV enterprises are looking for partners to develop fatherly. The domestic color TV enterprises engage in intensive cooperation with foreign multinational companies. The specific measures include: first of all, set up digital video technology development laboratory with foreign companies; secondly, establish strategic ties with multinational companies to expand the three-chip LCD rear projection TV market; thirdly, cooperate with the large enterprises of the US and Japan on the technology development. The strategy of cooperating with international technical powers is helpful for the Chinese color TV enterprises to improve the technical strength.

The cooperation among domestic backbone enterprises is accelerated. The Color TV Summit hosted by the Video Industry Association was convened in May 2005 in Beijing with participation of senior leaders of nine color TV manufacturers, namely TCL Group, Changhong Electric Co. Ltd., Konka Group, Skyworth Group, Hisense Group, Xiamen Overseas Chinese Electronic Co., Ltd., Haier Group, SVA Group and Panda Electronic Group. The total output of color TV of these nine manufacturers accounts for 84.4% of the total. At the meeting, the nine enterprises reached common understandings on seven aspects on future development of the color TV industry of China and declared to set up four coordination commissions for addressing issues in relation to the technical standards, intellectual property right, domestic market and international market. These

four commissions will coordinate the important issues in relation to the industry development. The Chinese color TV manufacturers have competed too much in the past years and lack of cooperation for years. That the backbone enterprises discuss the development strategy together at the meeting indicates a new starting point for the domestic color TV industry, showing the Chinese color TV manufacturers have transferred from the traditional competition relations to a harmonious relation of competition and cooperation and the coordination capability of the industry association is further enhanced.

5.Market development trend

Color TV. In 2006, the environment of policies, market, industry and technology of the color TV industry of China develop towards a good trend. First of all, the national economy will maintain a sound and rapid growth; the urban residents' income increases rapidly; the farmers' income grow year by year and the market purchasing power will grow continuously; secondly, the urbanization is speeding up and the proportion of urban population is increased; the newly increased commercial living houses exceed 25 million sets; all of these facts offer a market space for the color TV industry; thirdly, the competition among manufacturers tends to be rational and the market order is becoming standard, conducive to the color TV manufacturers to increase production and sale; fourthly, the Chinese enterprises are enlarging their sizes and the brand advantages are forming with increasing quality and efficiency, improving R&D capability and new products releasing to the market; fifthly, the promulgation of the digital HD TV standards and approach of 2008 Olympic Games will stimulate the domestic color TV market; sixthly, the Chinese color TV products enjoy increasing influence in the international market and the export will maintain a double-digit growth. In a word, the total quantity of color TV will maintain a growth of over 10%. The market share of the high-end color TV best represented by the LCD TV, plasma display TV and micro-display projection TV will increase fatherly.

Acoustics and audio products. In 2006, the market of audio products using the traditional analog technology will develop steadily or the market share will reduce gradually. More and more new products using the digital technology are released to the market. First of all, the portable digital

products represented by MP3 players will become the best sellers in recent years as the technology becomes mature and the product becomes affordable for consumers with reducing cost. Secondly, the digital amplifier will become a development focus in the set acoustics equipment. With increasing consumers of home theatre, the set acoustics equipment will develop towards high quality and high grade and enterprises shall emphasize innovation to develop Hi-Fi products and improve the product quality. Thirdly, the consumers increasingly value the brand of the audio products. Therefore, the enterprises shall underpin brand building and create famous brands to foster a batch of famous brand products during the 11th Five Year Plan period.

Disc player industry. The disc player industry experiences the development of VCD player and DVD player and the annual demand in the domestic and foreign market is about 200 million sets in recent years. With technical development, it has become a general trend of developing HD disc player. The domestic enterprises develop red-ray HD products relying on the legacy red-ray technology of China on the one hand and start to develop blue-ray products to try to become a major force of blue-ray product manufacturing in 2008 when the blue-ray products are released to the market.

In order to enable the disc player industry to develop in a sustainable way, the Chinese enterprises shall increase input in the core technology development and form the manufacturing technology and capability of core components so as to form a complete disc industry chain during the 11th Five Year Plan period.

Digital film equipment. The film digitalization is a development direction of the film industry and China has taken a leading role in this aspect in the world. According to the incomplete statistics, China has 200 large-scale digital cinemas, ranking the second position in terms of the number in the world. Currently, China has 35 cinema chains and 7,590 professional cinemas, most of which were built during the 1950s-1960s and face technical restructuring. The digital cinema restructuring and upgrading is a comprehensive project and the major input lies in the playing equipment (projector), acoustics equipment and dedicated digital film playing server. Generally speaking, the demand falls into three categories. The first category is nearly 8,000 large-scale cinemas. The digitalization investment of each cinema will reach about 1.5 million yuan; the

second is the small-sized projection hall that can accommodate about 50-100 audiences; China has about 20,000 such cinemas. The investment of each projection hall is about 300,000 yuan; the third is the electric cinema and China has more than 200,000 such cinemas. These cinemas are mainly located in the living quarters, institutional organs, schools, corps and rural areas where have the audiences are small or the mobile projection sites. The average investment of each site is about 50,000 yuan. Although the investment in such cinemas is only dozens of thousand yuan, such cinemas are expected to become the first market that the digital film equipment manufacturers enter into as they are large in quantity and easy to enter. The reason that the investment in these three kinds of cinemas is quite different is because the performance of the projectors, the acoustics equipment and players is different; so the price. The market of the digital cinema restructuring of China will be worth 26 billion yuan, said the experts of the industry.

In recent years, the Chinese enterprises have developed different equipment with independent intellectual property rights according to the market, e.g., the film player receiving films transmitted by the satellite and the film player for the films stored in the hard disc and compact disc; and the projectors with different specifications are also developed. The development and production of the equipment will drive development of the digital film industry of China.

6.Existing problems

First of all, the structural contradiction is outstanding and the core foundation industry is weak. The Chinese electronics and information core foundation industry is weak and affects independent development of the consumable electronic products. The core industries such as the IC, software, new type display device, electronic material, electric instrument and dedicated equipment are the key deciding the independent development of the electronic information industry while these core industries of China are left behind. China depends on import of the critical and core electronic components, chip, operating system and a great number of dedicated instrument and equipment, especially the display used by the flat panel TV, nearly all of which is imported. All these elements make development of the consumable electronics industry be constrained by the foreign enterprises and the industry is basically at a stage of passive imitation and tracking.

Secondly, the independent innovation capability is weak and the situation that the Chinese enterprises depend on the foreign enterprises in terms of the technology has not been changed yet. The patents of information technologies in China are mostly applied by foreign enterprises. The patents applied by Chinese enterprises are mostly for the utility model and design. Few patents are for invention, let alone invention patent applied in the foreign countries. The pressure facing the Chinese enterprises from the intellectual property and patent fees is increasing; therefore the adverse influence to the production and operation of the enterprises are outstanding. On the standard formulation, less than 2‰ of Chinese enterprises take part in the ISO and IEC standard formulation. The independent innovation capability and awareness of Chinese enterprises are weak. The concept shall be clarified that the enterprises are the main force of technical innovation. As a matter of fact, the technical innovation system with the enterprises as the main force has not formed yet and the government does not offer sufficient support for the enterprise innovation and corresponding measures are not in place.

Thirdly, China lacks of large enterprises and world famous brands with international competitiveness. In 2005, the total operation revenue of the Top 100 electronic and information companies is US$98.6 billion, slightly higher than that of IMB, which is US$96.5 billion in the same year. Compared with the multinational companies, the Chinese companies have a long way to go in terms of the company size. What's more, the Chinese companies lack of famous brands and have engaged in operation without brand building. Their products have to be sold at a lower price in the international market and many companies become cheap manufacturers of world famous brands.

Fourthly, the international trade protectionism prevails and the Chinese enterprises face challenges of anti-dumping and intellectual property right and enforced technical barriers from the multinational companies.

Fifthly, the non-standard operation in the circulation field seriously squeezed benefits of the manufacturers and caused little profits of the manufacturers. This is one of the reasons that the Chinese enterprises lack of development momentum.

Sixthly, although China has accessed to the WTO for four years, the Chinese enterprises did not

study the WTO rules. Under the WTO principles, the government did not offer sufficient support to the enterprises and not formulate supportive industrial policies.

7.Development direction

During the 11th Five Year Plan period, the digital audio and video industry shall optimize the industrial development environment and advocate a development guideline of security, environmental protection and energy conservation so as to realize independent innovation, common development and resource sharing and grow bigger and stronger.

【Statistics data】

Table 1 Major development fields of audio and video industry of China during the 11th Five Year Plan period

Major field	Development content
Fundamental common technologies and products	Digital audio and video coding and decoding, digital interface, technologies and products, set product core critical components, key equipment, environmental protection, energy-saving technologies.
Digital TV	Digital TV program production, program broadcasting, program transmission equipment, digital TV receiving equipment (including fixed receiving equipment and mobile receiving equipment etc.), data broadcasting system equipment and network TV system equipment.
Digital storage technologies and relevant products	Compact disc storage technologies and products, hard disc storage technologies and products, semi-conductor storage technologies and products.
Digital audio field	Digital audio broadcasting transmitter, receiving equipment, Hi-Fi acoustics technologies and equipment.
Digital film field	Digital film program production equipment, digital film satellite transmission and receiving equipment, digital film system equipment meeting the public and home entertainment requirements (including

	projection equipment, acoustics equipment, management, storage, playing and control system).
Digital home technologies and products	Digital home network system technologies and products

Table 2 Production and sale of consumable electronic products between 2003 and 2005

Unit: 10,000 sets

Product name	2003		2004		2005	
	Sales volume	Growth rate（%）	Sales volume	Growth rate（%）	Sales volume	Growth rate（%）
Black-and-white TV	284	-9.2	1272	347.5	883	-30.6
Color TV	6500	23.6	7256	11.6	8187	12.8
Inc.: flat panel TV					934	
Radio	25525	17.1	35000	37.1	28260	-19.3
Recorder	25525		35000	37.1	17830	-96.3
Digital laser player	9780	8.1	19360	98.0	18360	-5.2
Set acoustics equipment	1852	72.4	8120	338.4	8103	-0.2
Home theatre	712.3	70.4	785	10.2	2473	215.0
CD player	10000	61.6	8255	-17.5	6773	-18.0
Electric organ	111.6	-2.1	486	20.1	550	13.2
Vehicle acoustics equipment					3488	
VCD &DVD player core	9172		19361	111.0	20000	3.3

MP3 player					2014	

Remarks: data from the Economic Operation Department of the Ministry of Information Industry, China Electric Acoustics Industry Association and China Video Industry Association

Table 3 Output of main consumable electronic products between 2003 and 2005

Unit: 10,000 sets

Product name	2003 output	2004		2005	
		Output	Growth rate (%)	Output	Growth rate (%)
Black-and-white TV	280	1284	358.6	842	-34.4
Color TV	6522	7329	12.4	8283	13.0
Inc.: flat panel TV				1000	
Radio	25525	35000	37.1	28460	-18.7
Recorder	19041	16350	-14.1	18181	11.2
Digital laser player	11550	19360	67.6	20018	3.4
Set acoustics equipment	9200	61947	573.3	58755	-5.2
Home theatre	1853	8120	338.2	8603	5.9
CD player	712	785	10.3	2623	234.1
Electric organ	10000	8255	-17.5	6773	18.0
Vehicle acoustics equipment	111	486	337.8	550	13.2
VCD &DVD player core				3488	
MP3 player	9200	19361	110.4	20000	3.3
MP3				2014	

Remarks: data from the Economic Operation Department of the Ministry of Information Industry, China Electric Acoustics Industry Association and China Video Industry Association

Table 4 Export of main consumable electronic products between 2003 and 2005

Unit: 10,000 sets

Product name	2003		2004		2005	
	Output	Growth rate（%）	Output	Growth rate（%）	Output	Growth rate（%）
Black-and-white TV	199.6	-13.2	270	35.0	783	190.0
Color TV	2277.2	18.7	2772	21.7	3975	43.4
Inc.: flat panel TV					754	
Radio	24625	17.3	35000	42.1	27260	-22.1
Recorder	18441	-9.2	5353	23.0	24676	360.0
Digital laser player	9780	29.6	17411	78.0	17314	-0.5
Set acoustics equipment	1668	322.0	7042	0.5	6603	-6.2
Home theatre	7600	24.0	7755	2.0	5773	-25.5
CD player	375.2	275.2	445	18.5	480	7.9
Electric organ	2228		2703	21.3	2927	8.2
Vehicle acoustics equipment						
VCD &DVD player core						
MP3 player						
MP3						

Remarks: data from the Economic Operation Department of the Ministry of Information Industry, China Electric Acoustics Industry Association and China Video Industry Association

IV Computer industry

1.General introduction

In 2005, the computer industry of China maintains a rapid development and sees enlarging industry size, optimized industry structure, improved industry level, stable growth of import and export and rapid growth of the market. The favorable situation is a result of the industrial restructuring and changes of the growth mode. The growth quality and benefit increase are emphasized in the process.

2.Production and sale

（1） Production

In 2005, the computer manufacturing industry of China reported sales revenue of 1,045.25 billion yuan, up 21.7% on a year-on-year basis, accounting for 33% of the electronics manufacturing industry; the export delivery value is 798.93 billion yuan, up 27.8%, accounting for 43.4% of the electronic manufacturing industry; the industrial increment value reaches 201.5 billion yuan, up 22.4%, accounting for 22.4% of the total of the electronics manufacturing industry; it has secured the first position for three years in a row.

In the year 80.838 billion micro-computers are produced, up 35.3%. Of which, the laptop output is 45.649 million sets; 3.18 million sets are servers; 160.576 million sets are displays; of which 130.764 million sets are LCD; and 35.558million printers.

The industry clustering benefit is outstanding. Currently the computer industry of China has formed three production bases tied by the industrial chain, namely the Pearl River Delta, Yangtze River Delta and Bohai Sea Rim. The aggregation effect brought by the industry base consolidates the position of China as the global computer manufacturing center and drives production and sales capability of the Chinese companies on the set machine, peripheral equipment and supportive products and increases the influence of China in the global industry layout. In 2005, the micro-computers are mainly produced in Jiangsu, Shanghai and Guangdong, totaling 68.364million sets, accounting for 84.6% of the total PC output. The regional distribution shows

that the PC output in the eastern area of China is 80.665 million sets, accounting for 99.7% of the total PC output; the central and western area account for less than one percentage point in this aspect.

Achievements made in the industrial restructuring. The proportion of high-end PC products is increasing while the desktop PC development slows down; the proportion of laptop in the micro-computer is enlarging. The output of desktop PC increases by 9.1% in the year, 26.2 percentage points lower than the average growth rate of the micro-computer. The laptop output is 45.649 million sets, an increase of 18.149 million sets on a year-on-year basis; accounting for 56.5% of the total output, 11 percentage points higher than that of the previous year. The display output grows by 58.2%. The LCD output grows by 69.2%, higher than the display growth rate, accounting for 81.4% of the total display output of the year.

（2），Sale

In 2005, the sales of the Chinese computer market hits 476.22 billion yuan, up 16.6% on a year-on-year basis. Of which, the software sector grows by 17.9%; IT service grows by 20.1%. The market structure of the computer products has experienced large changes and the hardware products account for 70.9% of the market, or 0.6 percentage point lower than the previous year; the shares of software and IT service are enlarging continuously; the software sector increased by 0.2 percentage point while the IT service sector 0.4 percentage point. In the hardware equipment market, the growth of the computer system, peripheral equipment and the network equipment is slow and the growth of sales value is below 13%. On the contrary, the digital product market grows rapidly, up 59.3%, becoming an important force driving growth of the hardware market.

Computer system market. In 2005, the sales of the Chinese computer system market grows by 18.8%. Because of the price declining, the annual sales value only grows by 8.3%. With improving performance and sharp price declining, the laptop becomes the prior choice of personal users. Totaling 3.007 million laptops are sold in the year, up 37.5%; the sales value grows by 17.3%. The laptop is the sector enjoying the most rapid growth rate in the computer system market.

Peripheral equipment market. In 2005, the peripheral equipment market enjoys a stable growth. The sales of the disc storage system, multi-purpose flash (MPF) and the projectors grow by about 50% respectively, these sectors becoming the main force driving growth of the peripheral equipment market. Easy for carry and high capacity, the portable hard disc enjoys hot demand. The annual sales volume grows by 58.4% while the sales value grows by 50.8%; it becomes the product with the highest growth speed in the peripheral equipment market.

Network equipment market. In 2005, the network product market of China grows rapidly. The popularization of the WLAN and the consumers' increasing attentions to the network security, the WLAN and the network security equipment become the products enjoying the highest growth speed. The sales value of WLAN equipment hits 1.16 billion yuan, up 43.0%; the sales value of the network security equipment hits 1.94 billion yuan, up 31.3%.

The traditional network product market such as the hub, exchanger and router grows steadily. However, with popularization of the broadband access means such as the ADSL, the traditional dial-up connection method will be replaced. The sales volume of Modem reduces by 45.8% in the year while the sales value reduces by 49.1%.

Digital product market. With 3C technological integration and development of SOC and the embedded system technology, the price of digital 3C products is declining and the multi-media processing function is enhanced. The multi-media digital equipment market such as the MP3, MP4, digital camera and PDA grows rapidly. The digital product market grows by 59.3%, becoming the main force driving development of the hardware product market. The sales volume of MP3 hits 6.154 million sets, up 43.7%; the digital camera sales volume hits 4.338 million set, up 64.8%; the PDA sales volume reaches 4.935 million sets, up 38.4%.

3.International cooperation and foreign trade

In 2005, the import and export of computers hit US$188.12 billion. Of which, the export value is US$124.78 billion, up 27.5%; the import value is US$63.34 billion, up 24.0%.

（1），Export

In 2005, except the export of the scanner, floppy driver and CRT display decreases slightly, the

others realize growth of different extent. Of which, the laptop, hard disc driver, router and Modem grow by over 40%.

The Top 5 export destinations are Hong Kong SAR, the US, Japan, the Netherlands and Germany, totaling accounting for 73.7% of the total export of China. The export to Hong Kong SAR hit US$31.7 billion, surpassing the US's US$30.3 billion, and Hong Kong SAR becomes the largest export destination of computers of China. The export of computer to India, Luxemburg, Ireland, Canada and Malaysia grow sharply.

The computer export of China is still dominated by the foreign-funded enterprises. The foreign-funded enterprises account for 92% of the total computer export of China. Of which, the export of the solely foreign-funded enterprises reaches US$98.26 billion, accounting for 78%. The export of private enterprises grow rapidly, up 48.7%; the product export of state-owned enterprises grow slowly.

（2），Import

In 2005, except the import of hard disk drivers grow by 56.74%, the other computer products grow relatively slow and many products even negative growth. The products such as the hard disk driver, display and router which account for a large proportion of the import maintain high growth and the computer product import grows by 23.98%. The import of solely foreign-funded enterprises reaches US$45.1 billion, accounting for 71.2% of the total import of the computer products; the import of the state-owned enterprises accounts for 12.3% of the total import of computer products.

4.Analysis and anticipation

In 2005, the education market and government and enterprise informatization is the major force driving the desktop PC market growth. The demand from the mature IT technology application industries such as the finance and telecom industries slow down. During the same term, the informatization of the traditional logistics and manufacturing industries become hot and the information system of the healthcare and the epidemic prevention system and clinic medical treatment information system speed up informatization. The agriculture informatization is valued

while the focus of the industry informatization of China has transferred from the key industries to the traditional industries.

The small- and medium-sized enterprises become the highlight of the IT application market of China. The proportion of the informatization investment from the SMEs in the IT total investment is increasing. The building content has expanded from the simple basic network framework to the business application systems. The SME informatization has come to the growing stage and drive growth of the computer market of China.

Facing the ever fierce competition in the computer market, the enterprises shall constantly adjust the competition strategies. The specific measures include: first of all, the enterprises constantly release individualized products to meet requirements of different consumers in the maturing computer market; secondly, as the price competition is even intensive, most of the foreign brands in the Chinese market reduce prices to expand the market share, which squeeze the space of the Chinese brands and small brands. Thus the brand concentration in the market is increased slightly; thirdly, some traditional home appliance manufacturers enter the laptop market and some of the enterprises are forced out of the market, constantly adjusting of the computer market structure. The competition in the computer market of China has transferred from the all-directional competition to the differentiated dominant markets. The competition means have diversified from the production line to the core business strengthening and brand lift.

The e-government and digital Olympic venue building will significantly enhance development of the market of computing equipment, software and IT services; the informatization of the traditional industries such as the agriculture, medical service and construction industry will be deepened; the popularization of digital home will become a new drive of the rapid development of the market of consumable IT products. It is predicted that the computer market of China will grow stably in 2006.

5. Industry development during the 11th Five Year Plan period

During the 11th Five Year Plan period, the computer industry of China will optimize the industry structure, improve the industrial level and change the growth mode based on the scientific

development with focus on independent innovation. The main development thinking include: first, consolidate the industrial base and break the industrial bottleneck, optimize the industrial structure and enhance the industrial cluster building; secondly, form a technical innovation system with the enterprises as the main force quickly and enhance the independent innovation capability; thirdly, guide the enterprises to grow bigger and stronger and improve their capability on the capital operation and the brand operation; fourthly, give equal attention to the "introducing in" and "going global" and speed up the paces of internationalization.

During the 11th Five Year Plan period, China will give priority to and underpin development of seven sectors such as the computer system, network and information security equipment, digitalization 3C, mainly improve the independent design capability of enterprises on the complete set and system structure and quicken up formation of the technologies and products with independent intellectual property rights so as to enhance the industry scalization and increase the market share home and abroad. The major projects of the seven sectors include: first of all, the emphasis will be placed on the high-performance computer system, high-end server, PC, portable computer, industrial control computer and embedded computer in the computing system sector. Secondly, in the network equipment and product sector, the emphasis will be placed on the high-performance exchange equipment, high-end router, broadband mobile wireless access equipment and terminal, digital home network and terminals, new type high-performance network card and next generation Internet equipment. Thirdly, in the information security equipment and product sector, emphasis will be placed on the network security protection system, encrypted product and system, network isolation and exchange system, trusted computer system, security identification and certificating product, safety storage, backup and recovery equipment and system, information product security loophole test and risk assessment system. Fourthly, in the digital 3C product sector, emphasis will be placed on the mobile multi-media information terminals (including the PDA and multi-media handset with the functions of wireless communication and mobile TV), IT home appliance products (including the digital home appliance, IP STB, network video player, intellect-beneficial recreation and game products), digital video and audio products (including digital camera, digital vidicon, MP3 player and MP4 player), digital video monitor

product and system, and positioning and navigation service products and system. Fifthly, in the peripheral equipment sector, the emphasis will be placed on the new type display (including digital projector, OLED display, flat panel display, high-luminance and high-resolution display), printers (including the multi-functional printer, inkjet printer, laser printer, mini-printer etc.), storage equipment (including new type high-density micro hard disk, mass data storage system and product, electromagnetic storage product and optical storage product etc.), voice combination and recognition product and other new type input and output products. Sixthly, in the computer component, peripheral components and consumable sector, the emphasis will be placed on the mainboard and functional boards, key spare parts and components of peripheral equipment (stylus print head, inkjet print head, laser printer engine, laser engine of the project, optical spare parts and components, magnetic head component, optical head component, substrate, and various micro motors), high-performance UPS and various printing materials (inkjet head, ink, ink cartridge, selenium drum, laser ink powder and color photo inkjet paper etc.). Seventhly, in the dedicated computing equipment and application sector, emphasis will be placed on the electronic system and dedicated equipment of the finance, commerce and fiscal and taxation, IC card and reading and writing equipment and system, RFID and electronic mark products, digital safety production monitor and control system, digital medical equipment and system, intelligent traffic product and system, biometric identification product and application system.

【Statistics data】

Table 1　Production volume of main computer products of China between 2003 -2005

Unit:10,000 sets

Product	2003	2004	2005	Growth rate （%）
Desktop PC	2585.7	3224.8	3518.9	9.1
Laptop	630.3	2750.0	4564.9	66.0
Router		168.3	318.0	89.3
Display	7326.0	10148.9	16057.6	58.2
Inc.: LCD		7726.0	13076.4	69.3

Printer	1716.8	2754.0	3555.8	29.1

Remarks: data from the Ministry of Information Industry

Table 2 Sales volume and sales value of computer system products of China between 2003 -2005

Product	2003		2004		2005			
	Sales volume (10,000 sets)	Sales value (100 million yuan)	Sales volume (10,000 sets)	Sales value (100 million yuan)	Sales volume (10,000 sets)	Growth rate （%）	Sales value (100 million yuan)	Growth rate （%）
Desktop PC	1239.5	739.9	1421.6	767.7	1646.3	15.8	805.1	4.9
Laptop	156.1	215.8	218.6	274.4	300.7	37.6	322.0	17.4
PC server	27.7	64.5	34.8	71.6	42.7	22.7	83.9	17.2
NT workstation	2.7	83.1	3.2	85.6	3.8	18.8	90.0	5.1
RISC server	1.6	19.9	1.8	20.5	2.0	11.1	20.9	2.0
UNIX workstation	1.4	6.1	1.5	6.5	1.7	13.3	6.9	6.2
UPS	91.2	20.4	100.1	22.3	114.1	14.0	24.1	8.1
Disk storage system（TB）	6871.2	28.6	9963.3	31.8	14970.8	50.3	37.3	17.3
Printer	520.7	106.0	598.1	91.8	686.6	14.8	95.8	4.4
Multi-function machine	50.0	13.5	78.8	20.0	121.3	53.9	26.8	34.3
Optical storage	1540.7	48.2	1680.4	54.8				

Scanner	105.5	6.9	97.7	5.9	91.3	-6.6	5.2	-11.9
Projector	16.3	36.5	24.3	42.7	35.8	47.3	54.2	26.0
Display	1406.6	198.4	1638.8	229.1	1889.3	15.3	250.3	9.3
Portable hard drive	61.4	8.2	70.4	9.4	111.6	58.5	14.1	50.8
Router	23.5	54.1	30.8	70.1	35.3	14.6	78.6	12.1
Exchanger (10,000 ports)	1789.0	69.5	1829.0	74.6	2055.5	12.4	83.3	12.3
Modem	356.0	3.0	389.7	3.2	211.3	-45.8	1.6	-50.0
ADSL	2135.7	68.7	2333.4	51.7	2768.0	18.6	53.8	4.1
Network card	1016.0	4.9	1146.0	5.3	1395.0	21.7	5.4	1.9
MP3 player	177.3	15.6	428.4	34.8	615.4	43.7	45.5	30.8
Flash storage	420.7	10.7	594.6	17.3	772.8	30.0	21.8	26.0
Digital camera	135.4	29.3	263.2	54.7	433.8	64.8	85.7	56.7
PDA	218.5	58.6	356.7	90.5	493.5	38.4	161.3	78.2

Remarks: data from CCID Consulting. The sales volume of exchanger in 2004 is the revised value.

Table 3 Import and export of computer products between 2003 and 2005

Item	2003		2004		2005	
	Sum (US$100 million)	Growth rate （%）	Sum (US$100 million)	Growth rate （%）	Sum (US$100 million)	Growth rate （%）
Import value	344.5	102.0	510.9	48.3	633.4	24.0
Export value	663.4	85.5	979.0	47.6	1247.8	27.5
Total import	1007.9	91.0	1489.9	47.8	1881.2	26.3

&export value						

Remarks: data from the General Administration of Customs

Table 4 Import and export value of main computer products between 2003 and 2005

Unit: US$10,000

Item	2003		2004		2005	
	Export value	Import value	Export value	Import value	Export value	Import value
Micro computer	220383.1	4708.0	274647.4	6391.8	370648.2	6324.5
Laptop	1131412.9	52356.0	2077445.9	73625.7	2990203.4	65411.4
Calculator	94144.5	3730.9	80514.0	3456.9	81640.6	3947.0
Printer	431666.5	84225.2	614497.5	86827.3	688673.6	76621.5
Inc.: Stylus printer	9399.5	20058.4	10440.3	13449.4	12622.2	9989.0
Laser printer	282400.3	33919.9	395284.4	36406.9	418615.0	36461.2
Inkjet printer	129506.2	24758.0	188306.1	29516.9	227269.8	21090.5
Scanner	44175.6	8024.4	36534.6	6581.4	411076.9	6593.8
Hard disk driver	205532.2	303484.9	271031.3	461025.4	19144.5	722.605.3
Floppy driver	38124.5	24994.9	30412.1	14059.5	380710.5	8037.8
CD driver	276221.3	221160.5	369583.7	271640.7	1614798.2	323607.4
Display	957241.1	60230.2	1473016.7	88807.9	1453864.8	97514.8
Inc.： LCD	680207.3	44266.1	1185986.8	76567.1	159046.3	86625.9
CRT display	255973.9	13151.0	271613.4	9876.9	16299.0	10224.0
ATM	7014.7	8749.7	11386.3	10127.9	42867.9	8226.6
UPS	25950.8	8034.8	33456.5	8677.4	19502.4	9269.4
Hub	8990.6	1012.7	22288.6	1514.7	88031.3	506.9

Router	16286.7	25953.8	56384.7	29387.4	160948.4	36115.6
Modem	49288.7	35184.6	110750.1	19211.3	553530.0	17543.4
Digital camera			485586.4	88188.0	411076.9	100444.7

Remarks: data from the General Administration of Customs

V. Software industry

1. General

In 2005, China's software industry development environment was improved and the industry continued rapid growth and obtained great progresses. The industry scale reached 390bil yuan for the whole year, increasing by 40.3% year on year, having a share of 10.2% of national electronic information industry, 2.1% of national GDP and 5.9% of global software industry.

The sales amount of domestic software market rose from 254.8bil yuan of 2004 to 360.3bil yuan of 2005, up 41.4%, and the export amount reaching 3.6bil USD, up 28.6%, having a share of 1.3% of national electronic information industry export total and an industry population of above 0.9 mil persons in the whole year.

Software industry structure. The growth of software services is obviously faster than that of soft products, resulting in a bigger share in the industry. The software sales amount hit 193.2bil yuan for the whole year, 49.5% of the total amount of the software industry, up 26.4%. The sales amount of software for system integration reached 167.1bil yuan, 42.9% of software industry total amount, up 63.8%. The software export amount was 3.6bil USD, 7.6% of software industry total amount.

Software enterprise development. By the end of 2005, the accumulated number of appraised software reached 13194, and 30992 software products had been registered, including 2587 software enterprises appraised and 7916 software products registered in 2005. Currently, above 60 software enterprises have 1000 employees, 29 enterprises achieve incomes above 1 bil yuan, 37 enterprises have income between 500mil to 1 billion yuan and 262 enterprises between 100mil-500mil yuan. In addition, about 1000 software outsourcing enterprises exist.

In 2005, there were 157 key software enterprises in China's national plan. By the end of 2005, 237 software enterprises have qualified CMM3 certification and above, including 40 qualifying CMM4 and 29 qualifying CMM5 and CMMI5. Totally 1738 enterprises obtain the system integrator qualification certification across China, including 81 enterprises acquiring A-level qualification certification, 330 acquiring B-level qualification certification, 900 acquiring C-level qualification certification, and 427 acquiring D-level qualification certification. Software enterprises make progresses in establishing and improving technical innovation system and promoting innovation capabilities etc.

2. Scientific research and new products

In 2005, China made new progresses in software technology and product innovation. The market share of domestic software continuously increased and the application was wider than before.

The sales amount (only referring to software, excluding hardware, system integration and service cost) of Linux of the whole year reached 175 mil yuan, 9.8% of domestic operation system. The sales amount of Open Office packages and trans-platform office package (e.g. Evermore Office) hit 160mil yuan. The performance, quality, stability and reliability of Redflag-Linux, CS2C-Linux, Co-Create-Linux and other Linux operation systems and Evermore Office, Red Office and other office software were greatly improved and widely applied in electronic government affairs and genuine software promotion of city-level people's government etc.

Local database system development made great progresses. Wuhan Huagong Dameng Database Co.,Ltd., Basesoft and other IT companies' database management system software were widely applied in multiple large application systems.

Middleware technology and products developed quickly. Along with the gradual increase of platform products, components and coroutine packages also attains development. New products include VSP of Tongtech Co., Ltd. and tabling software of CVIC Software Engineering Co., Ltd. Domestic middleware companies started to launch independent "development standard" and form new technical alliance and established BOA concept through restructuring product lines with middleware supplier Tongtech Co., Ltd. as a representative.

Local management software has entered into the stage of popularization with rapid increasing of competitiveness and industry integration. UFIDA Software CO.LTD., Inspur Group and Kingdee International Software Group Company Limited and other domestic dominant management software enterprises jointly issue mobile business strategy and new products actively, such as UFIDA's launch of UFmobile series, Inspur's release of Enterprise Mobile Business Platform and Kingdee's launch of mobile product lines.

In the field of information security, Rising Corp. Ltd., Kingsoft Corp., Jiangmin SciTech and local antivirus software have captured 70% of the market. Domestic firewall products march forward to the high-end market. NGFW4000 series of Beijing TOPSEC Ltd., NetEye series of Neusoft Group Ltd. and Secwold Series of Secworld Ltd. have become brand products in the sector.

Embedded software system and integration service develop well. Local embedded system with independent intellectual property makes obvious progress. Hopen embedded operation system of Hopen Software Engineering Co., Ltd., DeltaOS of CoreTek Systems Incorporated, Linous of Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd. and embedded Linux of ZTE Corporation are widely applied in mobile phones, PDA, network computers and PMP products etc.

In 2005, the network game software industry market achieved a value of 4.12bil yuan, up 17.8%. A Swordman's Love2, QQ Imagination, Heroes in Three Kingdoms Online and a lot of independently developed network game software reached 50% network game market share.

3. Scientific and research achievement during the 10th five-year plan period

Progresses are made in the development of operation system, database management system, middleware software and office software and other basic core software.

Redflag-Linux, CS2C-Linux, Co-Create-Linux and other Linux operation systems were launched. Kingsoft WPS, Evermore Office, Red Office and other domestic office software and Kylin operation system with independently-developed core were released.

In the sector of database, Neusoft OpenBASE, Wuhan Huagong Dameng Database Co.,Ltd.'s DM series, BJSASC's OSCAR objective relation database, Basesoft's Kingbase ES and other local

database products were launched.

In the sector of middleware, a group of professional companies like Tongtech Co., Ltd., Kingdee International Software Group Company Limited, CVIC Software Engineering Co., Ltd. and Intervision Co.Ltd. have emerged and a series of higher-level middleware products were launched.

Enterprise management software witnessed a quick development. UFIDA Software CO.LTD., Kingdee International Software Group Company Limited，NEWGRAND Software Co., Ltd.，Inspur Group and Digital China Management Systems Limited(DCMS) had developed and launched brand products with wide applications, such as UFIDA's ERP-NC, ERP-U8, Kingdee's EAS and K/3, Newgrand's URP i6 series, Inspur's ERP/myGS and DCMS's Yifei ERP etc. Above products are dominant in middle- and low-end markets and developing towards high-end market.

Information security developed fast. Currently, a domestic firewall product system with NetEye series, Secwold V Series and TOPSEC series and other brand products as the major part has formed. Particularly, Rising Corp. Ltd., Kingsoft Corp. and other companies also specially launched local-made antivirus software. These products have a big share in domestic information security market and often win the bids for governmental purchase.

Great progresses were made in the R & D and application of embedded software. As for operation system, main products include Hopen developed by Hopen Software Engineering Co., Ltd., Delta by CoreTek Systems Incorporated and Smart by Zhejiang University etc. As for supporting software, main products include Hopen SDK developed by Hopen Software Engineering Co., Ltd., Lambdatool by CoreTek Systems Incorporated and OpenBASEMini by Neusoft Corporation. In the aspect of key application and platform, main products include HMAP intelligent mobile phone software platform developed by Hopen Software Engineering Co., Ltd., Hanwang handwriting identification system by Hanwang Corporation etc. In the aspect of application software, main products include Haier Group's LCD TV embedded software and air conditioner optimization and energy-saving control system by South China University of Technology etc.

Great development were also made in the industrialization of multi-media software, coordination software, education software, geography information system, network tools, Tibetan and other minority language software.

4. Key projects and items

In 2005, Ministry of Information Industry utilized electronic information industry development fund to support the development and industrialization of new-generation safe BIOS, the development of network game monitor software, network game development platform, the development of digital TV receiving software, the development and industrialization of large database management system and the development and industrialization of major products, encouraged the government of all levels and all walks of life to invest in software industry and continued to support the construction of national software and IC public service platform to provide common and basic technical supports and services for the development of software industry.

In the field of electronic government affair, the Phase I standardization project branched out in 2005. The standard formulation stably moved forward, resulting in the formulation of a group of standard drafts including Standardization Guidance, government information resource catalog and exchange catalog. In the aspect of agriculture informatization, Golden Agriculture Project was officially approved and initiated and “three electrics gather one” agriculture information service pilot project was kicked off by the Ministry of Agriculture. In the aspect of education software, Ministry of Education initiated “digitalized study harbor and life-long learning society construction and demonstration” education reform program at the end of 2005, and funded higher education scientific and technological innovation project and 44 major programs. In early 2005, National 863 Plan initiated 123 projects in IT sector, added 65 projects in September and another 83 projects at the year end.

In 2005, hi-tech middle and small technical innovation fund totally supported 1552 programs. National Natural Science Foundation of China accepted 1417 project applications with 270 applications approved. On Oct. 10, 2005, a small satellite Beijing No. 1, a major project of Beijing Digital Project, was successfully launched in Russia.

5. International cooperation and foreign trade

In 2005, Channelsoft (Beijing) Technology Co., Ltd. won venture capital of 31.5mil USD from Soft Bank AIF, Walden international and China Science & Merchants Investment （fund） Management Co., Ltd. Eabax Software (Group) Co.,Ltd. won the capital infusion of 7.6mil USD from Union Fortune Investment Co., Ltd, UK. In Aug. 2005, Microsoft Corporation and Inspur Group inked a contract for a 25mil USD infusion to the latter. In Oct., 2005, Microsoft Corporation invested 20mil USD to Chinasoft International for a joint establishment of Chinasoft-Microsoft Online Lab. As for enterprise merge and acquisition and integration, Hinge Software Co., Ltd. acquired Warburg Pincus' shares in Shanghai Huateng Software Systems Co., Ltd. and AsiaInfo's HR resource management and business intelligence software businesses with 15mil yuan. The merger of hiSoft Technology International Ltd., Ensemble International Limited and Kesen IT (Asia) Co.,Ltd. resulted in a hiSoft Corporation.

In 2005, China achieved software export amount of 3.6bil USD, up 28.2% year on year, mainly exporting to Japan, US, Europe and Southeast Asia etc. The export to Japan was overwhelming, reaching 59% of total, followed by Europe and USA with a share of 40%, up 4% year on year. The export of software with independent intellectual property made breakthroughs. Guangzhou Zhongwang's CAD entered into the markets of South Africa, Southeast Asia and US. Evermore's integrated Office products accessed into Japan, North America and Africa. UFIDA's ERP software entered into Southeast Asian market. Antivirus software of Rising Corp. Ltd. and Jiangmin SciTech started expansion in Japanese market.

In 2005, MII teamed up with NDRC, MOST and Beijing Municipal People's Government successfully held the International Soft China 2005, building an interactive platform for displaying the main results of the latest development of domestic software and information service industry, the progress of new products, IT technology and informatization. MII has continued to support the building of Linux public service platform, direct the Software and IC Promotion Center to hold IP China 2005 OSS and IP Annual Conference, established China Linux Industry Strategy Union together with China OSS Promotion Union and Linux enterprises and released OSS China

Community to the industry.

6. Existing problems

First, industry policies for embedding software and risk investment need to be carried out. The legislation for industry policies shall be accelerated. In addition, industry public service system requires further improvement.

Second, the industry scale is small and has low concentration and poor general innovation capability. The industry lacks large enterprises capable for international competitiveness and independently innovative technologies and products. The market share of local software products needs to be continuously increased.

Third, the structural contradiction and supply and demand contradiction of software talents are still keen. The lack of high quality innovative software talents cannot meet the demands of the industry development and the application and informatization of IT.

Fourth, the lack of fund for industry development restricts the core technology research and development, enterprise scale enlargement and strength intensification.

Fifth, low software output, low outsourcing service capability and internationalization level, low brand recognition and poor comprehensive competitiveness.

Sixth, the software piracy rate is still high. Vicious competition among enterprises tends to seriousness. Order of software industry needs to be standardized urgently.

7. Development plan for the 11th Five-year Plan Period

The development plan of China's software industry during the 11th Five-year Plan Period mainly includes:

Speed up the development of operation system and core basic software, promote application of Service-Oriented Architecture, software components and multiplexing technologies, and master the basic software technology with independent intellectual properties.

The whole industry will continue driving embedding software technology and product independent innovation.

The whole computer industry will work out corresponding polices and measures to improve the capability of independent innovation, enhance the R & D and application of software technologies and products concerning reliable computers, network monitoring, disaster tolerance and emergency response etc., accelerate the development of information security software and the industry to build an independent and controllable information security system.

Grasp the development trend and characteristics of software service and outsourcing, encourage and support software enterprises to improve software service and outsourcing capability and quality, transfer business mode, broaden business channel and market, and accelerate software service and outsourcing business.

Develop industry application software by means of the opportunities in modern service industries including electronic government electronic business, electronic logistics, electronic medical care, electronic manufacture and remote education etc.

Speed up the development of digital industry with effective measures.

Develop intelligent Chinese information process software.

8. Market analysis and forecast

In 2005, China's software industry value hit 390 bil yuan, 5.9% of global software industry.

The market segmentation of China's software products shows: system software has a sales amount of 10.2 bil yuan, up 7.3% and 5.3% of total; support software has a sales amount of 19.6 bil yuan, up 13.9% and 10.1% of total; application software has a sales amount of 163.4bil yuan, up 29.6% and 84.6% of total, higher than the other two kinds.

In 2005, the value of domestic software service and system integration market hit 167.1 bil yuan, 42.9% of the total amount of software industry, up 63.8%, higher than the growth of software products. With the progress of software governmental purchase and electronic government project and the continuous increase of the share of industry dedicated software to the applications, the enterprise management informatization software promotes the growth of industry general software market. Rapid increase of network applications, security and anti-virus software and game software will become the high light of general software market.

The year of 2006 will witness the continuous rapid growth of China's software industry. The maturity and continuous expansion of China's software market, the promotion of the government's intellectual property protection and the transnational software enterprise's recognition to China's market will surely drive the entry of foreign investment to China's software market and fuel the development of China's software enterprises. With the boost of China's strategy of promoting industrialization with informatization, the informatization for traditional enterprises, especially the informatization market of middle and small-sized enterprises, will be the key parts of China's software industry in 2006.

It is estimated more software enterprises will explore the network game industry to fully expand the market space and potentials in 2006.

In 2006, the market of mobile software will be expanded to meet the demand of computer platform's transfer. With the increasingly complication of end-user's application system and network environment, comprehensive network security products compliant with user's demands will be the focus of the development of software industry. In addition, the Internet-based software service industry will also make development.

【Statistics data】

Table 1 Software industry's share in three indexes before 2004 and 2005

Year	Software industry scale （100mil yuan）	National electronics and information industry scale （ 100mil yuan）	Share in national electronics and information industry （%）	National GDP (100mil yuan)	Share in national GDP (%)	National software industry scale (100mil USD)	Share in national software industry (%)
2004	2780	30700	9.0	159000	1.7	7826	4.3
2005	3900	38400	10.2	182000	2.1	8239	5.9
Increase	40.3	25.1	13.3	14.5	23.5	5.3	37.2

rate （%）							

Remark: Data source: China Software Industry Association

Table 2 National software market breakdowns in 2004-2005

Unit: 100mil yuan

Year	Software products	Software services	Total
2004	1528	1020	2548
2005	1932	1671	3603
Increase rate（%）	26.4	63.8	41.4

Remark: Data source: China Software Industry Association

Table 3 China software exports in 2003-2005

Unit: 100mil USD

Year	Value of software exports	Increase rate（%）	Value of electronics and information industry exports	Share in value of electronics and information industry exports （%）
2003	20	33.3	1410	1.4
2004	28	40.0	2075	1.4
2005	36	28.6	2682	1.3

Remark: Data source: China Software Industry Association

Table 4 National software industry breakdowns in 2004-2005

Unit: 100mil yuan

Year	Software industry scale	Software products	Share in software industry	Software service and	Share in software industry	Software export	Share in software industry

			total（%）	system integration	total（%）		total（%）
2004	2780	1528	55	1020	36.7	232	8.3
2005	3900	1932	49.5	1671	42.9	297	7.6

Remark: Data source: China Software Industry Association

Table 5　National software industry breakdowns in 2004-2005

Unit: 100mil yuan

Year	System software	Support software	Application software	Total
2004	95	172	1261	1528
2005	102	196	1634	1932
Increase rate （%）	7.4	14.0	29.6	26.4

Remark: Data source: China Software Industry Association

9. Supplemental notes to statistics on software industry in the article

According to the report of the first national economic census in Dec. 2004, China GDP value reached 15.9tril yuan, 2.3tril yuan higher than 13.6tril yuan, the statistic value of 2006.

According to MII's all-society statistics after the economic census, China's electronic information industry scale of 2004 achieved 3.07tril yuan, 0.42tril yuan increase comparing with original statistics. In 2004, national software industry scale hit 278bil yuan, an increase of 48bil yuan comparing with original statistics and software export value achieved 2.8bil USD, 200mil USD up.

Supplemental notes originate from the "Special Explanation" of 2006 China Software Industry Development Research Report.

VI. Electronic special equipment sector

1.Overview

In 2006, totally 85 enterprises and institutions were engaged in the electronic special equipment production and research and development in China. There were 29162 persons including 5965 technicians, 5.8% reduction from 2004, serving in the industry in 2006, decreasing by 2.1% comparing with in 2004. In 2005, the enterprise classification situation in electronic special equipment sector continued the trend in 2004. There were 41 state-owned and state holding enterprises, same level with the number in 2004. The number of private enterprises hit 33, up 17.8%. The fixed assets net value of the whole industry reached 2285.56mil yuan, 0.2% up, including 2078.53mil yuan of equipment manufacturers, 12.7% up.

2.Production and distribution

In 2005, China's market scale for electronic special equipment was about 5bil USD, including above 4bil USD for semiconducting equipment (inclusive of solar cell equipment) and surface mount device. The market share of home-made electronic special equipment is about 10%. The market share of magnetic material equipment reached 90% in China, and the sale of solar cells and LCDs also dramatically increased.

The gross production value, sales income, total profit and realized profit of China's electronic special equipment sector continued growth in 2005. But the growth speed of economy profit is still slower than the expansion of economy scale. The share of electronic special equipment in China's information product manufacture industry was still very low, which cannot meet the development demand of the electronic information product manufacture industry.

In 2005, the total output of electronic special equipment was 55658 sets, decreasing by 5% year on year, and the production distribution rate reached 96.2%, achieving 16.5% growth, reflecting the prosperous market demand. The sales volume of electronic special equipment increased by 14.9%, having a share of 68% of sales volume of all equipment, increasing slightly comparing with that in 2004. The sales volume of electronic tools and moulds was 45% of the total sales volume of the

production unit, 10% up.

Upon product breakdown analysis, electronic assembling wiring equipment grew fastest in 2005 with a sales volume growth of 305.7% and a sales amount explosion of 112.2%. The reasons are the low statistics base due to the sector slide in 2004, the continuous increase of electronic assembling sector and the periodical features of the product development.

Semiconducting and integrated circuit equipment continued rapid growth with a sales volume growth of 57.6% and a sales amount explosion of 58.6% and became no. 1 of China's electronic special equipment. The main reason was that the robust solar battery equipment (incl. battery plate production equipment and battery material production equipment) market boosted the growth the whole semiconducting equipment market. In 2005, the sales volume of solar grade silicon mono-crystal furnaces was about 300 sets, and the sales amount doubled comparing in that of 2004. The sales amount of the equipment for producing solar cell plates exceeded 100mil yuan, increasing by 100%.

In 2005, the sales amount of China's electronic general equipment increased by 45.8%, the sales amount of purification equipment rose by 29.4% and the sales amount of environment and reliability experimental equipment grew by 22.3%.

In 2005, the sales volume and sales amount of electronic vacuum apparatus and photoelectric apparatus reduced by 46.7% and 15.7% respectively, ranking down to No. 5 in the industry. The main reason was that the boom of flat display components seriously pinched the market space of traditional CPT and CDT color television kinescopes and glass tubes and further influenced the equipment for color television kinescope and glass tube production lines.

In 2005, the sales volume and sales amount of electronic components and electromechanical equipment decreased by 37.6% and 13.6% respectively.

In 2005, electronic special tool and mould industry dramatically revived according to industry association statistics. The sales volume increased by 67.8% year on year. The sales volume of electronic special tools was 7.48 mil pcs, production distribution rate of 92.5%, sales amount of 68.28mil yuan, increasing by 64.9%. The sales quantity of special electronic mould achieved 1680 sets, production distribution rate of 98.6%,,sales amount of 201.52mil yuan, increasing by

194.8%.

In 2005, the gross sales volume of top 10 enterprises in electronic special equipment sector was 2666.87mil yuan, 59.4% of industry total, increasing by 33.6% year on year. The fulfilled pre-tax profit total was 332.31mil yuan, decreasing by 3%, 49.8% of industry total. The profit achieved was 209.40mil yuan, growing by 12.1%, 56.1% of industry total. The sales income of top 10 industry enterprises exceeded 100mil yuan.

In 2005, 16 enterprises in electronic special equipment sector suffered loss, the same with that in 2004. The total loss was 47.34mil yuan, reducing by 27.3% comparing with the previous year.

3.Scientific research and new products

In 2005, the whole industry's completed new product projects in total reached 533, increasing by 27.2% year on year. 449 of which were electronic special equipment and electronic special mould. The successive production of these new products will explore new markets for China's electronic special equipment. Semi-conducting equipment and the expansion, development and application based on it have become the focus of the new product development in the industry, which will play an important role to the development of the whole electronic special equipment.

Following projects were listed into China Electronic Information Industry Development Fund Project Catalogue: PECVD (plasma chemical vapor deposition) in Solar Cell Special Equipment, silicon wafer multi-wire cutting equipment development and industrialization project and COG assembly equipment development and industrialization projects. PECVD development and industrialization by China Electronics Technology Group Corporation No.48 Research Institute, 8-inch silicon wafer multi-wire cutting equipment development and industrialization by China Electronics Technology Group Corporation No.45 Research Institute and COG assembly equipment development and industrialization by China Electronics Technology Group Corporation No.2 Research Institute were listed in the schedule. The development of some 8-inch silicon wafer machining equipment sponsored with the electronic information industry development fund and semiconducting equipment independently planned by the enterprises had qualified acceptance, and some were to enter into the acceptance stage.

New type vacuum annealing furnace developed by Beijing Sevenstar Electronics Co., Ltd. has high automation degree and stable performance. The product technical indexes have reached the technical level of international products of the same type and won the recognition of the industry. Since its access into the secondary (rechargeable) battery equipment manufacture industry in 1997, the company has been a market leader in China with gradual expansion of market share year and an annual sales amount growth above 100% over the past five years. It has become the largest secondary battery equipment manufacturer with most complete product series and highest assembly capability in China.

Jiangsu Suzhou Purification Group Co.,Ltd. and its branch companies had developed 32 new products, completed 13 new product appraisal projects including one state-level project, nine province-level and three city-level projects, launched 16 projects with mass-production capability during 2004 and 2005.

BG-706 exposure machine, BD-601 integrated circuit taping machine and key equipment for glaze potentiometer line and other six equipment developed by China Electronics Technology Group Corporation No.45 Research Institute have qualified the scientific and technical result appraisals of Ministry of Information Industry. Production line assessment for megasonic cleaner, probe station and other equipment is started. “Scientific research on 100nm CMP (Chemical Machine Polishing) equipment core technology” undertaken by the Institute has made progress. Centering on CMP equipment necessary for 90nm-100nm integrated circuit, the research has made important breakthroughs in polishing head micro-pressure self-adjustment technology, polishing end-point examination technology, kinematic control technology of polishing head and polishing table and other aspects. It has achieved multiple proprietary technology, laying a foundation for producing CMP equipment with independent intellectual property in China.

A major project of “MOCVD(6x2 in.) Production Equipment for GaN” in new material field listed in the National 863 Plan undertaken by China Electronics Technology Group Corporation No.48 Research Institute has qualified acceptance and won high praise. The success of the project enabled China to become one of the few countries with the development and production capability for GaN-MOCVD equipment, contributing a lot to release China’s semi-conducting lighting

project from the technical bottleneck.

Silicon wafer polishing and cleaning machines, chemical wet benches and plasma cleaners developed by China Electronics Technology Group Corporation No.2 Research Institute have been applied in semi-conducting chip manufacture and post encapsulation lines and expanded to solar cell and electronic component production fields. PT-21 polaroid placement machines developed by the institute solved the technical difficulties of alignment placement, static elimination and color speck control. The institute, teamed up with Changchun Guanghua Micro-Electronics Equipment Engineering Centre, Co.,Ltd., successfully developed COG bonding machines, key equipment for TFT-LCD module production line. Based on this, Taiyuan Fenghua Information Equipment Co.,Ltd. succeeded in the development of SBD-50 dual-position major and pre-pressure integrated bonding machine.

The Northwest Machine Co., Ltd. independently developed silicon aluminum minuteness wire drawing machines, potential forming machines and other five new products and qualified provincial appraisal.

Lanzhou Rapid Corporation developed X61 1572B-1（24B）digital-control precision grinding machines and X07 105-1 multi-wire saw cutting machines to meet the grinding, polishing and cutting demands of 8-12in. large-sized material. X07 320-1 silicon bar cutters and X07 700-1 multi-blade slicers developed for solar cell industry were delivered to users for application.

Shanghai Nissin Machine Tool Co.,Ltd. independently developed NWS6X2 and NWS270 silicon multi-wire cutters for the application of solar cell industry to be launched into the market in 2006.

Zhaoqing New Baohua Electronics Equipment Co.,Ltd., in cooperation with South China University of Technology, has tackled a series of technical difficulties and developed middle- and high-speed placement machines with eight placement heads. In addition, the company also developed some assembly equipment necessary for SMT lines.

Since its entry into integrated circuit post encapsulation equipment market in 2003, Grand-tech (Shenzhen) Co., Ltd. has developed six types of post encapsulation equipment including plastic packaging presses.

4.Major works and key projects

The operation test of several sophisticated integrated circuit key equipment was completed based on the β sample machine built in 2004. These equipment, among other China's national hi-tech projects, are on the way to industrialization production.

In 2005, five new products in China's electronics special equipment industry were listed into the key new product plan of Ministry of Science and Technology, namely, DQX-206 plasma cleaner, DHJ-500 multi-blade glass scriber and DWT-122 full automatic alignment placement machine applied by China Electronics Technology Group Corporation No.2 Research Institute, AFYJ special air-conditioner for clean operation room applied by Jiangsu Suzhou Purification Group Co.,Ltd. and multiply injection heads plastic encapsulation mould applied by Tongling Suntech Apicyamada Technical Co.,Ltd.

In 2005, the project "shadow mask PDP (SM-PDP) assembly, sealing and exhaust automatic production line" in national high-tech development plan (863 Plan) assumed by Beijing Sevenstar Electronics Co., Ltd. passed the acceptance of the Ministry of Science and Technology. The project consists of an SMPDP (shadow mask PDP) alignment assembly machine, an exhaust furnace and a board sintering furnace. The main technical parameters of the sample machine satisfied the contract demands. It was the initial equipment in China receiving praises of acceptance expert panel and applied in the Display Technology Labor of Southeast University. In addition, the first vertical diffusion/oxidation oven applied in 8-inch IC process lines in China undertaken by the company passed the acceptance of electronics production and development fund group. The successful development of the equipment fills the vacancy of the 8-inch vertical furnace manufacture in China.

In Apr. 2005, national key project "special appliance double-faced lithography" undertaken by China Electronics Technology Group Corporation No.45 Research Institute passed acceptance and design confirmation at the meeting of experts from equipment industry and application unit. This equipment is the first practical 6-inch double-faced lithography in China, successfully applying multiple key technologies like big area exposure system, BSA and wedge error compensation

technologies etc. and filling the domestic vacant field with leading technologies. In Oct. 2005, the research of full automatic bonder/full automatic dicing saw listed in National 863 Plan passed the acceptance in Shenzhen after above one year efforts. The appraisal panel argued a 14 line/sec full automatic boner and an 8-inch full automatic dicing saw with independent intellectual properties were developed, the main technical indexes qualified the requirements in the contract and nine patent applications were reported, performing the tasks regulated in the contract.

In March 2005, the foundation ceremony of Beijing Zhongkexin Electronics Equipment Co.,Ltd.'s ion implanter R & D and industrialization base was held in Beijing Tongzhou District Light Mechanical and Electrical Integration Base, which is a milestone for China's ion implanter toward industrialization development.

The R & D and Production Building for the Industrialization of Key Production Equipment for New Electronic Chip Components, a hi-tech industrialization model project and a Shanxi 1311 Industry Structure Adjustment Project performed by Taiyuan Fenghua Information Equipment Co.,Ltd. was built for production, covering a total area of 8294m^2. On Sept. 15, 2005, the project of New Type Electronic Components Special Production Equipment Assembly Line assumed by Taiyuan Fenghua Information Equipment Co.,Ltd. was listed in NDRC 2005 Information Industry Enterprises Technical Progress and Industry Upgrading Projects. With a gross investment of 52mil yuan, the project aims to produce chip components, film capacitors, LCD and liquid display modules and other special equipment with global leading quality.

On May 18, the project of Environment and Reliability Technology and Equipment State Engineering Center broke earth in Suzhou Testing Instrument Factory. The Center, jointly prepared by Suzhou Testing Instrument Factory, Beihang University, Zhejiang University, Quanta USA, is planned to be completed in three years with budgeted investment of 50mil yuan, floor space of 12000 m^2 and building area of 5000 m^2. The main task is to provide conditions for the development of climate, environment and reliability test equipment and reliability test service for products from users

Entrusted by NDRC, Anhui NDRC organizes experts to accept a project with an annual capacity of 200 Sets of Plastic Encapsulation Mould Industrialization Model Project undertaken by

Tongling Suntech Technical Co., Ltd. The project was listed in state key hi-tech industrialization projects in 2000 and the key national debt-funded project of Tongling in 2001. After above one year trial run, manufacture and test upon the completion, effective technical upgrading was made in many aspects. And multi-injection heads plastic encapsulation mould, tantalum capacitor plastic encapsulation mould and other 10 new products were successively developed, contributing a lot to China's plastic encapsulation technology.

The electronics production and development project of IC Production Line Equipment—IC Automatic Encapsulation System R & D and Industrialization Project undertaken by Tongling Suntech Apicyamada Technical Co., Ltd. passed the acceptance organized by the Electronics and Information Industry Development Fund Management Office affiliated to Ministry of Information Industry.

5.International cooperation and foreign trade

In 2005, the export delivery value of the whole industry hit 313mil yuan, increasing by 30.6% including 16.1% growth from equipment units.

By the end of May 2005, Beijing Sevenstar Electronics Co., Ltd. performed the export of flowmeters valued 480thd Euros. An export of 1mil Euros is expected for the whole year. The Second Research Institute of China Electronics Technology Group Corporation mass-exported glass scribers, removing bubbles machines of liquid crystal polaroid and other 12 TFT-LCD production equipment to Sharp, Malaysia. The equipment qualified the acceptance and was delivered to use. Export of the equipment is another breakthrough after LCD placement machine, highlighting this kind of Chinese products capable to compete in international market.

Fenglei electronic special equipment produced by Lanzhou Rapid Corporation has won favors of a score of countries including USA, Japan, Iran, Romania, India, Taiwan, Hong Kong, Southeast Asian countries. By the end of May 2005, the export order amount exceeded 10mil yuan. Currently, the company established a sales company in Japan. The company plans to set up sales companies in USA, India and other countries in 2006 upon expectation.

In 2005, the soldering pin and wafer testing card production lines in the Suzhou-based plants of

K&S, one of global largest semi-conductor encapsulation and testing equipment manufacturers, came into operation. Before the end of 2005, other two production procedures for slices and testing clips will also be moved to Suzhou. And an R & D center is planned to be built in Suzhou with a local software development team.

In Mar. 2005, SEMICON China 2005 was held in Shanghai New International Expo Centre with an exhibition area of 31000m^2 and above 870 semiconducting equipment and material manufacturers from home and abroad. More than 150 persons from units/enterprises with years of engagement in semiconducting equipment R & D participated in technical seminars and other activities. In July 2005, China Electronic Production Equipment Industry Association (CEPEA) organized a delegation to participate in SEMICON West and relevant seminars for the 3rd time and visited related equipment and parts manufacture companies upon the invitation of SEMI.

In 2005, CEPEA established a liaison office in Tokyo, Japan. It is the first overseas office of CEPEA. The organization also sponsored electronic special equipment-related international technical exchanges in China, such as FPD China 2005, the SMT-related 2005 China International Forum and the 4th Lead-free Manufacture Process, Fault Detection and Reliability etc.

6.Market analysis and outlook

The year of 2006 is the first year of China's 11th Five-year Plan period. China will strive to improve the independent innovation capability, accelerate economy increase mode transformation and promote the development of advanced manufacture industry and hi-tech industry with electronic industry as the representatives. Electronic special equipment industry should speed up structure adjustment and enhance independent innovation to ensure the continuous and rapid development of the industry.

In 2005, the output of solar cell-related equipment and testing instrument exceeded 6000 sets with sales volume above 1bil USD. The sales amount of China local-made semiconducting equipment reached 670mil yuan, up 58.6%, with solar cell production equipment as the main contributor. Currently, most equipment for solar cell production lines can be produced in China, resulting in an accumulate foreign exchange saving of 100 mil USD over the past several years and an

investment saving for users of 800 mil yuan. In the same year, totally 330 sets of relevant equipment were sold in domestic market, reaching a sales amount of 250mil yuan. Some equipment was exported. It is expected that the solar cell equipment market will keep a high growth rate in 2006. Before 2010, the photovoltaic industry will keep a 30% annual growth rate. On Jan. 1, 2006, Renewable Energy Law will be officially implemented. The PV industry will become an important growth point in China's semiconducting industry.

It is estimated that domestic high-level IC equipment will achieve industrialization breakthrough and domestic IC equipment renovation market will boom in 2006.

Upon estimation, China's semiconducting and IC industry will sustain prosperity due to the pulling effect of China's entire electronic equipment market to the IC market, the continuance of the global semiconducting industry's shift to Chinese mainland and the big gap between supply and demand of semiconductors and IC in China etc. Semiconducting equipment will still be the biggest highlight in electronic special equipment in 2006.

The CRT market goes into the depression period, and no large-scale investment to production lines will appear. So, various equipment for flat display component production lines will gradually dominate the market. With the acceleration of forging a China's TFT-LCD industry chain in 2006 and the growth of high brightness LED market sales scale, the demands to LCD-related equipment and LED production equipment will rise and further push forward the development of China's electronic special equipment industry.

Currently, the market share of local-made magnetic material equipment reaches 90%. In the 11^{th} five-year plan period, China will strive to grow into a powerful magnetic material production country. Magnetic material production enterprises will enlarge investment to develop high-end magnetic material products, increase the capacity for high-level products, develop high-level magnetic material production equipment as well as highly accurate and intelligent equipment with high efficiency and low energy consumption. Magnetic material production equipment in 2006 will have a leap growth in China, becoming a major force driving the development of electronic component equipment.

Presently, only 30% of Chinese cables can participate in international competition, and quality and

technical level requires urgent improvement for the remainder. Therefore, the gross market demand will not increase greatly in the coming period while the type and quality demands are the market focus. Enterprises producing wire and cable special equipment shall timely adjust product structure, adapt to market demand and actively develop high-end cable equipment.

According to statistics from the Customs, China imported 8992 sets of placement machines valued 1.478bil USD. Import will still be dominant in 2006 since middle and high-level automatic placement machines are not available in domestic market currently. It is worthwhile to point out that China develops fast in lead-free soldering equipment manufacture and has made progress in AOI testing equipment, hopefully increasing the domestic market share of local made equipment.

Lead-free technology development of the electronic whole product industry has become a necessary trend in the international information industry development. Measures for the Control of Pollution from Electronic Information Products promulgated by seven ministries and commissions of China will come into force from March 1, 2007. Thousands of electronic whole product lines will confront lead-free renovation. So, lead-free equipment will develop in 2006.

As for SMT equipment, higher demands are required to the testing process in assembly with the trend of small encapsulation and high-density assembly. AOI (automatic optical inspection) and AXI (automatic X-ray inspection) equipment are necessary tools for improving PCB assembly quality. The sale of AXI and AOI will grow slightly in 2006. In addition, soldering equipment, inspecting equipment, printing equipment and loading/unloading machines are dominant in China's SMT equipment industry currently, but the product structure will surely change and placement machines will grow fast with the transfer of international placement machine production to China and the gradual industrialization of middle and low-end placement machines.

To sum up, the industry gross value, sales revenue and gross profit before tax of the industry will continuously keep a synchronous growth at a rate above 10% in 2006.

【Statistics data】

Table 1. Scale of electronic special equipment industry in 2005

Nature	Number of institutes	Number of enterprises	Headcounts （persons）	Incl. ： technicians （persons）

SOE and state holding dominant shares	4	41	21101	4640
Private		33	3820	687
Stock		7	2573	460
Three types of foreign-funded enterprises		4	1668	178
Total	4	85	29162	5965

Table 2. Product sales volume of electronic special equipment industry between 2003 and 2005

Product	Unit	2003		2004		2005	
		Sales volume	Growth rate (%)	Sales volume	Growth rate (%)	Sales volume	Growth rate (%)
Semiconducting and IC equipment	Set	1174	-28.8	2580	119.8	4065	57.6
Electronic component equipment	Set	10953	205.6	4381	-60.0	2733	-37.6
Electric and photoelectric equipment	Set	1295	54.7	5044	289.5	2688	-46.7
Environment and reliability test equipment	Set	2153	14.6	2496	15.9	2943	17.9
Purification equipment	Set	94858	14.7	14885	-84.3	17033	14.4

Whole electronic machine assembly equipment	Set	1261	128.9	471	-62.6	1911	305.7
Electronics general equipment	Set	23904	46.7	16743	-30.0	26791	60.0
Electronics special tool	10,000pcs	489	17.7	141	-71.3	748	430.5
Electronics special mould	Set	930	2.9	890	-4.3	1680	88.8

Table 3. Product sales amount of electronic special equipment industry between 2003 and 2005

Product	Unit	2003		2004		2005	
		Sales amount	Growth rate（%）	Sales amount			Sales amount
Semiconducting and IC equipment	10,000yuan	25361	51.3	42353	67.0	67184	58.6
Electronic component equipment	10,000yuan	39401	-0.3	64283	63.2	55561	-13.6
Electric and photoelectric equipment	10,000yuan	24536	35.2	31365	27.8	26445	-15.7
Environment and reliability test equipment	10,000yuan	17887	15.9	18665	4.3	22832	22.3
Purification	10,000yuan	49582	20.0	45032	-9.2	58294	29.5

equipment							
Whole electronic machine assembly equipment	10,000yuan	10912	196.2	3514	-67.8	7458	112.2
Electronics general equipment	10,000yuan	35640	161.6	27833	21.9	40571	45.8
Electronics special tool	10,000yuan	5871	21.5	4140	-29.5	6828	64.9
Electronics special mould	10,000yuan	13426	-15.4	6835	-49.1	20152	194.8

Table 4. Top 10 companies of in sales amount of electronic special equipment industry in 2005

Rank	Company	Sales amount （10,000yuan）
1	Jiangsu Suzhou Purification Group Co.,Ltd.	54553
2	Beijing Sevenstar Electronics Co., Ltd.	40600
3	Tongling Suntech Technical Co., Ltd.	32461
4	Northwest Machine Co., Ltd.	26553
5	Sichuan DanFu Compressor Co.Ltd.	25247
6	Lanxin Rapid Industrial Group Co.,Ltd.	22063
7	China Electronics Technology Group Corporation No.45 Research Institute	16745
8	China Electronics Technology Group Corporation No.2 Research Institute	16558
9	Grand-tech (Shenzhen) Co., Ltd.	16222

10	China Electronics Technology Group Corporation No.48 Research Institute	15685

Table 5. Product export value of electronic special equipment industry between 2003 and 2005

Category	Unit	2003	2004	2005
Electronics special equipment	10,000yuan	4830	10486	12177
Electronics special tools and moulds	10,000yuan	1927	197	5838
Others	10,000yuan	11181	13247	13242
Total	10,000yuan	17938	23930	31257

Table 6. Main economy indexes of electronic special equipment industry between 2003 and 2005

Item	Unit	2003	2004	2005	Growth rate（%）
Gross value of industrial output of the whole industry	10,000yuan	363288	408228	473879	16.1
Incl.：industrial output value of this sector	10,000yuan	245257	282322	327269	15.9
Industrial value added of the whole industry	10,000yuan	115585	132020	141099	6.9
Incl. ：value added of this sector	10,000yuan	74867	76604	88742	15.9
Sales income of the whole industry	10,000yuan	342159	390751	449063	14.9
Incl.：product sales income of this sector	10,000yuan	222616	249119	285274	14.5

Pre-tax profit of the whole industry	10,000yuan	54475	61308	66679	8.8
Gross profit of the total industry	10,000yuan	28852	33962	37305	9.8

Note: Data of Table 1 to Table 6 are sourced from China Electronic Production Equipment Industry Association (CEPEA).

VII. Electronic measurement instrument industry

1.General

In 2005, the gross industrial value of the whole industry in China hit 7446.9mil yuan, up 35% year-on-year, the sales income reached 7702.5mil yuan, increasing by 36% year-on-year, the output achieved 8.33mil sets, growing by 18% and the sales volume hit 8.64mil sets, up 225. Moreover, a group of electronic measurement products with international advanced level were developed, which fills the domestic vacancies, satisfied the urgent demands of some industry and improved the competitiveness at domestic and international markets. The statistics to oscillographs and other 15 products show the export growth rate of 11% with value of 322.71mil USD, which is higher than the import growth rate of 1% with value of 1775.81mil USD. In addition, key enterprises kept simultaneously continuous increases in domestic and foreign markets. Liaoning No. 2 Radio Plant (Group) was ranked No. 88 in 2006 Top 100 Electronic Information Enterprises in China with the sales amount of 1685mil yuan, up 7.6%, the export amount of 990.15mil yuan, up 21% and reaching 59% of the total sales amount. Ningbo Zhongce Electronics Co., Ltd. achieved the sales amount increase of 21%, export amount increase of 33% and reaching 56% of the total sales amount. Jiangsu Luyang Electronic Instrument Group Co., Ltd. achieved the sales amount increase of 34%, export amount increase of 100% and reaching 15% of the total sales amount. China Electronics Technology Group Corporation No.41 Research Institute achieved the sales amount increase of 36%, including electronic measurement instrument export of 30 sets of spectrum analyzers valued 1.2mil yuan. Rigol Technologies Inc. achieved the sales

amount increase of 127%, export amount increase of 586% and reaching 50% of the total sales amount. And finally, the research on measurement instrument for national Digital Television Project made progresses.

2.Production and sale

The production and sale of electronic measurement instrument industry made a comparatively big growth in 2005. The output of electronic measurement instrument totaled 8.33mil sets, up 18% or 1.27mil sets. Totally 36 kinds of products made great increases, including frequency measurement instrument growing by 33% and stabilized voltage power supply increasing by 135%. The sales total of electronic measurement instrument hit 8.64mil sets, rising by 22% or 1.53mil sets. Totally 35 kinds of products made great increases, including frequency measurement instrument growing by 27% and stabilized voltage power supply increasing by 86%. The output of medical instrument reached 7,349,373 sets, rising by 74% or 2,187,341 sets. The medical microwave electronic instrument hit output of 67,744 sets and sales volume of 93,866 sets.

3.Scientific research and new products development

In 2005, the focuses of scientific research and new products development of this sector are adjusting product structure, improve the proportion of middle and high level products and develop new products with independent intellectual properties.

Digital storage oscilloscope—It is a product segment with widest application and fastest technical development currently. After about two-year-long efforts, especially the successful development of digital storage oscilloscopes with independent intellectual property in 2005 broke the market monopoly of foreign products and improved the competitiveness of domestic products, resulting in the expansion of domestic market share and the export of considerate products. YB54500 （500MHz）broadband digital storage oscilloscopes mass-produced by Jiangsu Luyang Electronic Instrument Group Co., Ltd. was delivered to customers for application. DS100 series digital storage oscilloscopes mass-produced by Rigol Technologies Inc. contain logic analysis modules and abundant triggering functions. AV4446 （500MHz）broadband digital storage oscilloscopes

made by China Electronics Technology Group Corporation No. 41 Research Institute have qualified appraisals. The product's maximum sampling rates are 1GSa/s (simultaneous operation of two channels) and 2GSa/s (one channel only).

Other products:

KH39 series EMC disturbance field strength test receivers and KH3025 series active antennas developed by KaiHong Instruments Research & Development Center, Beijing Computer Factory No.1 has been produced in small batches. The frequency spectrum range is 9KHz to 30MHz and the resolution is 1Hz. The price is only 1/5 of similar foreign products. The KH4137 full automatic digital low-distortion measurement instruments have leading technical indexes in China and achieve international level, being widely applied in the sectors of national defense, measurement, production lines and schools. The frequency scope are 10Hz—150KHz （unbalanced situation） and 10Hz—100KHz（balanced situation）.

AV3639/3629/3629A high performance integrated vector network analyzers developed by China Electronics Technology Group Corporation No. 41 Research Institute have features of high measurement speed, high test accuracy, big dynamic range, friendly human-machine interface, high intelligence and stability and good reliability and repeatability. They are new generation products of local-made vector network analyzers with frequency spectrum range of 300KHz-60GGHz and frequency resolution of 1Hz. DT series digital TV code stream real time monitoring analyzers by the Institute are applicable for the monitoring and feature analysis to errors occurred in all links of MPEG—2DVB digital TV transmission field. In addition, the Institute also developed CATV testers, AV high power amplifiers, AV high power attenuators, AV directional couplers, AV portable field strength testers, AV communication equipment comprehensive testers, AV random signal testing and analyzing systems, AV portable thermal CAMs, AV site electromagnetic frequency spectrum monitoring systems, AV6496 optical fiber welding machines, AV4061/4062 frequency spectrum analyzers, AV5282 portable PCM comprehensive testers and other high-level products.

DSA1000 real time triggering radio frequency spectrum analyzers with frequency measurement range of 9KHz—3GHz developed by Rigol Technologies Inc. apply digital signal process chips

and large-scale high-speed programmable logic components. Products of all levels can be produced by means of changing the hardware and software configuration. Reconfiguration of programmable logic components and digital signal process systems along with multiple USB/LAN ports and system upgrading software shall be applied to enable the products with good scalability.

SA1000 series full digital frequency feature tester developed by Shijiazhuang The Fourth Radio Factory, applying frequency-sweeping signal source direct digital synthesis technology and MPU control and built-in cymoscopes, can perform the measurement of frequency-amplitude and frequency-phase features at any frequency section between 20Hz—300MHz without demodulation probes. ST1010 digital frequency long stability testers, having built-in frequency difference multipliers and high-accuracy gap-free measurement, can fully replace analog phase comparators.

CD433 series portable UHF millivoltmeters/power meters developed by Sichuan Chuanjia Electronics Co.,Ltd. can measure various complicated waveforms like CDMA, GSM, PHS and I/Q modulation in addition to normal measurements. CD33 series portable digital TV field intensity instruments/true power meters can be applied in the measurement of digital TV signals. CD—OPM533 series optical power meters can be used in digital TV and communication fields.

TianJin Xince Electronics Apparatus Technology Co.,Ltd. also developed XC4010 frequency response feature testers, XC6531 aviation accumulator testing systems and other new products.

4. Major and key projects

In 2005, China-made microwave and millimetre wave antenna general test platform was completed and passed the acceptance. Major achievements were made in broadband electromagnetic information leakage test system. Satisfied results were obtained for field trial application of the low frequency time-code timing signal test receiving system.

Digitalized electronic and communication measurement instrument research and development production condition renovation undertaken by Jiangsu Luyang Electronic Instrument Group Co., Ltd. was officially initiated by NDRC in the “Fa Gai Ban Gao Ji [2005] No. 1944” document. The

main contents are improving the level of design and development, measurement inspection and production and manufacture and enlarging production scale. The objective is to build a capability of annual production of 40,000 sets of digitalized products and reach international advanced technical level.

Digital TV Dedicated Signal Source Research & Development and Promotion and Application undertaken by China Electronics Technology Group Corporation No.41 Research Institute is under the trial manufacture of sample machines.

The Digital TV Signal Generators and Testing Instrument Industrialization Project for Digital TV Project under taken by Sichuan Chuanjia Electronics Co.,Ltd. made some progress. The project has a total investment of 40mil yuan to forge annual capacity of 255 sets of digital TV concentrated signal sources and 25 sets of digital TV signal generation analyzers. Currently, DTVG channel analog signal generators for the project were performed and started for sale. In addition, products for TV stations of all levels, network centers and quality inspection department, stores, household appliances and other consumers are under research and development. As for digital TV testing instruments, the researches of multi-channel signal testers, MPEG-2 code stream generators, digital TV signal recorders/players and Audio/video frequency measurement instruments were performed.

5. International cooperation and foreign trade

On Jan. 28, 2005, Agilent Qianfeng Electronic Technologies Co., Ltd. was established with gross investment of 50mil USD (about 400mil RMB). The first phase investment was 29.98mil USD with registration capital of 25mil USD. The company, mainly specializing in the R & D, production and sale of precision instruments for education, communication, aviation and aerospace sectors, aims at providing electronic measurement products and services with high performance price ratio to domestic and international markets. Establishment of the company will further enlarge Agilent's market share (70% currently) in China and strengthen the competition among domestic enterprises to drive them to the way of independent innovation and development for globally advanced products for the purpose of improve their competitiveness in international

market.

China Customs statistics on oscillographs and other 15 products show the export growth of electronic measurement instruments was higher than the import growth in 2005.

Liaoning No. 2 Radio Plant sold 1750 sets of AV meter testers (automobile stereo testing instrument) to abroad, achieving 100% export; 1700 sets of oscillographs including 600 sets for export, achieving 35% export.

Ningbo Zhongce Electronics Co., Ltd. achieved export amount of 75.56mil yuan, reaching 56% of the total sales amount, up 33%, including instrument export amount of 38.87mil yuan, 51% of total export, up 29%.

Jiangsu Luyang Electronic Instrument Group Co., Ltd. exported 24,370 sets of oscillographs, up 35%, achieving an export amount of 20mil yuan, an increase of 100%.

China Electronics Technology Group Corporation No.41 Research Institute exported 30 sets of spectrum analyzers valued 1.2mil yuan. The export is limited, but it shows the increase of export kinds of China-made hi-tech products.

Rigol Technologies Inc. achieved an export value of 4.7mil USD for digital storage oscillographs, up 570%.

KaiHong Instruments Research & Development Center, Beijing Computer Factory No.1 exported two sets of full automatic digital low-distortion measurement instruments which have independent intelligent property and reach international level, showing a development trend that China-made high-level products will continuously enter into global market.

6. Market outlook

China's electronic measurement instrument market will continue a rapid growth thanks to the boom of China's national economy and the hi-tech development trend of all industries of national economy. However, a big gap exists between the supply of local-made electronic measurement instruments and the demand of local industries. The key to improve the market share of local-made electronic measurement instruments is to "upgrade product structure" and develop globally-leading products with independent intelligent property. Aiming at "upgrading product

structure", the local market shares of oscillographs, frequency spectrum analyzers, frequency spectrum measurement instruments, network analyzers, disturbance field intensity measurement instruments, stabilized power supplies, synthetic signal sources and other general measurement instrument will be continuously enlarged. The market share of broadcasting and TV measurement instruments, especially the digital TV measurement instrument, will be improved after completing Digital TV Special Project. However, the marker share increase of local digital TV measurement instruments depends on the development of more globally-leading products due to the gaps in varieties and technologies. As for communication measurement instruments, especially mobile communication measurement instruments, the development of local products are still under the starting period. Due to the restriction of development technology, the market share of local IC measurement instrument will have no big changes. Local electronic appliances and instruments will have more market shares in medical electronic instruments, medical microwave electronic apparatus, coal electronic appliances and mine and metallurgy electronic appliances.

[Statistics data]

Table 1 Products with big output growth of electronic measurement instrument industry between 2004 and 2005

Product	Unit	2004	2005	Growth rate (%)
Frequency measurement instrument	set	1700656	2255264	32.6
Digital pulse frequency measurement instrument	set	1696705	2156695	27.1
Analog frequency measurement instrument	set	3868	5749	48.6
Counter	set	845	3316338	3924.7times
Time measurement instrument	set	83	116	39.8
Frequency standard instrument	set		92704	
DC digital voltmeter	set	168	2558	15.2times
Oscillograph	set	31076	107691	3.5times

Digital storage oscillograph	set	6000	16000	2.7times
General oscillograph	set	25032	83139	2.3times
Sampling memory oscillograph	set	20	52	2.6times
Dedicated oscillograph	set	24	8500	354.2times
Component parameter measurement instrument	set	1467	29604	20.2times
IC measurement instrument	set	98	192	2times
Frequency spectrum waveform analyzer	set	1690	2265	1.3times
Frequency-sweeping instrument	set	1430	1845	29.0
Frequency spectrum analyzer	set	110	270	2.5times
Vector network analyzer	set	115	210	82.6
Scalar network analyzer	set	40	76	90.0
Parts for microwave measurement instrument	set	21466	35496	65.4
Microwave power meter	set	175	310	77.1
Broadcasting and TV measurement instrument	set	11742	14701	25.3
Ultra low frequency measurement instrument	set	25	155	6.2times
Frequency response analyzer	set	25	73	2.9times
Acoustics measurement instrument	set	4759	6746	41.8
Sound-level meter	set	1156	1409	21.9
Noise statistics and analysis instrument	set	513	1173	2.3times
Noise frequency spectrum analyzer	set	110	195	77.3
Acoustics calibration device	set	226	369	63.3

Ambient vibration analyzer	set	70	150	2.1times
Other acoustics instrument	set	2754	3600	30.7
Disturbance field strength measurement instrument	set	2	2990	1495times
Digital full automatic disturbance field strength testing receiver	set	2	10	5times
Stabilized power supply	set	1721015	40455635	23.5times
DC stabilized power supply	set	248312	996624	4times
AC stabilized power supply	set	83446	97085	16.3
Constant-current stabilized power supply	set	746357	1362714	82.6
Power inverter	set	556056	1312112	2.4times
Laser power supply	set	1020	1300	27.5
Recording and displaying instrument	set	659	18339	27.8times
Recorder	set	254	2500	9.8times
Display	set	405	15839	39.1times
Power signal source	set	800	1050	31.3
Synthetic signal source	set	180	385	2.1times
Medical electronic appliance	set	4218849	7349373	74.2
Medical supersonic electronic appliance	set	1740	2175	25.0
Medical laser electronic appliance	set	107	740	6.9times
Medical bio-chemical electronic appliance	set	230	4610	20times
Medical HF microwave ray electronic appliance	set	87	67905	780.5times
Medical microwave electronic	set		67744	

appliance				
Coal industry electronic appliance	set	12956	34777	2.7times
Water and power industry electronic appliance	set	86048	91446	6.3
Mining and metallurgy industry electronic appliance	set	48	205	4.3times
Gas industry electronic appliance	set	373	561	50.4

Table 2 Products with big sales volume growth of electronic measurement instrument industry between 2004 and 2005

Product	Unit	2004	2005	Growth rate（%）
Frequency measurement instrument	set	1701309	2174573	27.8
Digital pulse frequency measurement instrument	set	1696978	2076700	22.4
Analog frequency measurement instrument	set	3472	5196	49.7
Counter	set	806	3275977	4064.5times
Time measurement instrument	set	53	112	111.3
Frequency standard instrument	set		92704	
DC digital voltmeter	set	183	2268	12.4times
Oscillograph	set	24232	104691	332.0
Digital storage oscillograph	set	6000	16000	166.7
General oscillograph	set	24064	80354	233.9
Dedicated oscillograph	set	29	8300	286.2times
Component parameter measurement instrument	set	1471	30060	20.4times
IC measurement instrument	set	83	153	84.3

Frequency spectrum analyzer	set	170	285	67.6
Vector network analyzer	set	115	205	78.3
Scalar network analyzer	set	40	80	100.0
Parts for microwave measurement instrument	set	19411	29483	51.9
Microwave power meter	set	175	310	77.1
Optical communication testing instrument	set	415	570	37.4
Broadcasting and TV measurement instrument	set	11706	14665	5.3
Ultra low frequency measurement instrument	set	127	181	42.5
Ultra low frequency voltmeter	set	24	27	12.5
Acoustics measurement instrument	set	4776	6127	28.3
Sound-level meter	set	1138	1340	17.8
Noise statistics and analysis instrument	set	719	986	37.1
Noise frequency spectrum analyzer	set	150	186	24.0
Acoustics calibration device	set	233	283	21.5
Ambient vibration analyzer	set	75	140	86.7
Disturbance field strength measurement instrument	set	1	3091	3090
Digital full automatic disturbance field strength testing receiver	set	1	3	200
Stabilized power supply	set	1676569	3114065	85.7
DC stabilized power supply	set	241802	993248	310.8
Constant-current stabilized power	set	726593	1076593	48.2

supply				
Power inverter	set	542355	951659	75.5
Laser power supply	set	1010	1305	29.2
Recording and displaying instrument	set	678	20118	29.7
Recorder	set	244	2250	9.2times
Display	set	434	17868	41.2times
Power signal source	set	780	1036	32.8
Synthetic signal source	set	180	350	94.4
Digital signal generator	set		2424	
Meteorological electronic appliance	set	49130	54250	10.4
Medical electronic appliance	set	9550	2187341	229times
Medical supersonic electronic appliance	set	1715	2110	23.0
Medical laser electronic appliance	set	86	696	8.1times
Medical bio-chemical electronic appliance	set	228	4634	20.3times
Medical HF microwave ray electronic appliance	set	80	94120	1176.5times
Medical microwave electronic appliance	set		93866	
Textile industry electronic appliance	set	3210	3575	11.4
Coal industry electronic appliance	set	9951	32679	228.4
Water and power industry electronic appliance	set	83731	91098	8.8
Mining and metallurgy industry electronic appliance	set	48	203	4.2times
Gas industry electronic appliance	set	468	555	18.6

IC card intelligent ammeter	set	2160000	14660000	6.8times
IC card intelligent heat meter	set	10000	70000	7times

Table 3 Product output of electronic measurement instrument industry between 2003 and 2005

Unit: set

Product	2003	2004	2005	
			Output	Growth rate（%）
Frequency measurement instrument		1700656	2255264（ excluding counters）	33.0
Frequency measurement instrument		1696705	2156695	27.1
Digital pulse frequency measurement instrument		3868	5749	49.0
Counter	381	845	3316338	3924.7times
Time measurement instrument	103	83	116	39.8
Frequency standard instrument			92704	
DC digital voltmeter	57	168	2558	15.3times
Incl. ： Digital HF voltmeter			396	
Digital multimeter	1256930	2204241	458150	-79.2
Analog voltmeter	3960	3076	2692	-12.5
Digital panel meter	78851	130613		
Voltage and power standard equipment			194	

Others			22341	
Oscillograph		31076	107691	3.5times
Digital storage oscillograph		6000	16000	2.7times
General oscillograph	17442	25032	83139	3.3times
Sampling, storage and memory oscillograph	67	20	52	2.6times
Dedicated oscillograph	139	24	8500	354.2
Component parameter measurement instrument		1467	29604	1918
IC measurement instrument	63	98	192	99
Component parameter measurement instrument	1164	527	392	-25.6
Frequency spectrum waveform analyzer		1690	2265	34.0
Scanner		1430	1845	29.0
Frequency spectrum analyzer		110	270	2.5times
Full automatic digital distortion measurement instrument		150	150	
Microwave measurement instrument		7309 （ excluding parts）	1869 （ excluding parts）	-74.4
Vector network analyzer		115	210	82.6
Scalar network analyzer		40	76	90.0

Other microwave instrument	47585	6979	1269	-81.8
Parts for microwave measurement instrument		21466	35496	65.4
Microwave power meter		175	310	77.1
Communication testing instrument		10708	2832	-73.6
Carrier wave communication testing instrument	167	8003	231	-97.1
Analog/digital mobile communication testing instrument	10354	2090	2021	-3.3
Optical communication testing instrument		615	580	-5.7
Broadcasting and TV measurement instrument	10085	11742	14701	25.2
Ultra low frequency measurement instrument		25	155	6.2times
Frequency response analyzer	69	25	73	2.9times
Ultra low frequency signal source	80		30	
Ultra low frequency voltmeter	18		52	
Acoustics measurement instrument		4759	6746	41.8
Sound-level meter		1156	1409	22

Noise statistics and analysis instrument	579	513	1173	2.3times
Noise frequency spectrum analyzer		110	195	1.8times
Acoustics calibration device	486	226	369	63.3
Ambient vibration analyzer		70	150	2.1times
Other acoustics instrument	2379	2754	3600	30.7
Disturbance field strength measurement instrument		4	3000	
Disturbance field strength measurement meter		2	2990	1494
Digital full automatic disturbance field strength testing receiver		2	10	400
Stabilized power supply		1721015	4045635	2.4times
DC stabilized power supply	286139	248312	996624	4times
AC stabilized power supply	77167	83446	97085	16.3
Constant-current stabilized power supply	660331	746357	1362714	82.6
Power inverter	394229	556056	1312112	2.4times
Laser power supply	900	1020	1300	27.5

Other power supply	32076	85789	5800	-93.2
Recording and displaying instrument		659	18339	27.8times
Recorder	5098	254	2500	9.8times
Display	522	405	15839	39.1times
Signal source		1168137	1258379	7.7
LF signal source	5352	4580	3040	-33.6
HF signal source	550	1055	960	-9.0
Power signal generator	700	800	1050	31.3
Synthetic signal generator		180	385	2.1times
Power amplifier	18000	12700	13900	9.5
Digital signal generator			2255	
Other signal source	307	1148822	1236789	7.7
Other measurement instrument		61718	87952（Excluding crystal oscillator）	42.5
Puncture device	773	857	832	-2.9
Atomic ray instrument	9826	11661	7224	-38.0
Meteorological instrument	110972	49200	49000	-0.4
Crystal oscillator			17662191	
Standard inductor, capacitor and resistor			30896	
Medical electronic instrument and				

equipment				
Medical electronic appliance	471819	4218849	7349373	74.2
Medical supersonic instrument	25443	1740	2175	1.3times
Medical laser instrument		107	740	6.9times
Medical bio-chemical instrument	3706	230	4610	600
Medical HF, microwave and ray instruments		87	67905	
Medical HF instrument		87	85	
Medical microwave instrument			67744	
Medical ray instrument			76	
TCM diagnosistic instrument		1662	736	-55.7
Pubic traffic electronic appliance		555426	438483	-21.1
Textile industry electronic appliance	3597	3632	3358	-7.5
Coal industry electronic appliance	735	12956	34777	2.7times
Petro-chemical industry electronic appliance	1202	2728	1793	-34.3
Water and power industry electronic appliance	221055	86048	91446	6.3

Mining and metallurgy industry electronic appliance	226	48	205	4.3times
Gas industry electronic appliance	68	373	561	50.4
Traffica and transportation industry electronic appliance	116549	449641	306343	-31.7
Culture and education industry electronic appliance	454810	393266	15200	
Other electronic appliance	405798	919007	1722569	87.4
DC ammeter and voltmeter	383900	440000		
AC ammeter and voltmeter	584000	220000	160000	-27.3
Power meter		360000	120000	-66.7
Electronics dedicated ammeter		24500000	20880000	-14.7
Special purpose ammeter	186100	500000	390000	-22.0
IC card intelligent ammeter	46619200	2060000	14580000	7.1times
IC card intelligent water meter	20963000	30000	20000	-33.3
IC card intelligent coal gas meter	214200	140000	70000	-50.0
IC card intelligent heat	203300	90000	70000	-22.0

meter				
Others	1400000	21690000	5750000	-73.0

Table 4. Product sales volume of electronic measurement instrument industry between 2003 and 2005

Product	2003		2004		2005	
	Sales volume（set）	Growth rate（%）	Sales volume（set）	Sales volume（set）	Sales volume（set）	Sales volume（set）
Frequency measurement instrument			1701309		2174573（excluding counters）	27.4
Digital pulse frequency measurement instrument			1696978		2076700	22.4
Analog frequency measurement instrument			3472		5196	49.7
Counter	473	22	806	70.0	3275977	4064.5times
Frequency standard instrument					92704	
Voltage measurement instrument			2404708		607376	-74.7
DC digital voltmeter	48	-90		3.8times	2268	12.4times
Incl.：digital HF voltmeter					380	
Digital multimeter	1266513	208	2271160	79.3	578789	-74.5

Voltage and power standard equipment					193	
Analog voltmeter	3635	18	3581	-1.5	2759	-23.0
Digital panel meter	80181		129784	62.0		
Others					23367	
Oscillograph			24232		104691	4.3times
Digital storage oscillograph			6000		16000	2.7times
General oscillograph	16340	-35	24064	47.3	80354	3.3times
Sampling, storage and memory oscillograph	85	-13	97	14.1	37	-61.9
Dedicated oscillograph	154	-21	29	-81.0	8300	286.2times
Component parameter measurement instrument			1471		30060	20.4times
IC measurement instrument	63		83	31.8	153	84.3
Component parameter measurement instrument	1115	-12	565	-49.3	238	-57.9
Frequency spectrum waveform analyzer			703		449	-36.1
Scanner	352	19	393	11.6	107	-72.8
Frequency spectrum analyzer			170		255	50
Distortion measurement	794	16	432	-45.6	235	-46.0

instrument						
FM deviation modulation measurement instrument	131		59	-55.0		
Others					140	
Microwave measurement instrument			8995（excluding parts）		1554（excluding parts）	-82.7
Vector network analyzer			115		205	78.3
Scalar network analyzer			40		80	100.0
Microwave power meter			175		310	77.1
Other microwave instrument	46893	104	8840	-81.2	1269	-85.6
Parts for microwave measurement instrument	14134542		19411		29483	51.9
Communication testing instrument			9792		2245	-77.1
Carrier wave communication testing instrument	178	-30	7875	44.2times	360	-95.4
Analog/digital mobile communication testing instrument	8290	125	1917	-77.0	1885	-1.7

Optical communication testing instrument			415		570	37.3
Broadcasting and TV measurement instrument	10379		11706	12.8	14665	25.3
Ultra low frequency measurement instrument			127		181	42.5
Ultra low frequency signal analyzer	2		1	-50.0		
Frequency response analyzer	28		47	67.9	42	-10.6
Ultra low frequency signal source	31		51	64.5	44	-13.7
Ultra low frequency voltmeter	34		24	-29.4	27	12.5
Filter, amplifier	744		4		4	
Others					64	
Acoustics measurement instrument			5476		6127	11.9
Sound-level meter			1138		1340	17.8
Noise statistics and analysis instrument			719		986	37.1
Noise frequency spectrum analyzer			150		186	24.0
Ambient vibration analyzer			75		140	86.7

Noise vibration calibration device			233		283	21.5
Other acoustics instrument	2141	-30	3161	47.6	3192	1.0
Disturbance field strength measurement instrument						
Disturbance field strength measurement meter			1		3091	3091times
Digital full automatic disturbance field strength testing receiver			1		3	3times
Stabilized power supply			1676569		3114065	85.7
DC stabilized power supply	303290	61	241802	-20.3	993248	4.1times
AC stabilized power supply	77980	-74	82100	5.3	85360	4.0
Constant-current stabilized power supply	651034	60	726593	11.6	1076593	48.2
Power inverter	391710	23	542355	38.5	951659	75.5
Laser power supply	896	281	1010	12.7	1305	29.2
Emergency power supply			25			
Other power supply	32974	-85	82684	2.5times	5900	-92.9
Recording and			678		20118	29.7times

displaying instrument						
Recorder	4982		244		2250	9.2times
Display	347		434	25.1	17868	41.2times
Signal source			1225543		1245097	1.6
LF signal source	5362	21	4893	-8.7	2569	-47.5
HF signal source	723	182	1033	42.9	951	-7.9
Power signal generator	705	143	780	11.0	1036	32.8
Synthetic signal generator			180		350	94
Power amplifier	18400		12100	-34.0	12000	-0.8
Digital signal generator					2424	
Other signal source	298		1184561		1226117	3.5
Other measurement instrument					93190（excluding crystal oscillators）	
Puncture device	789	4	898	14.0	772	-14.0
Atomic ray instrument	10287	213	11680	14.0	7274	-37.7
Meteorological instrument	110972	13	49130	-56.0	54250	10.4
Crystal oscillator					17582191	
Standard inductor, capacitor and resistor					30894	
Medical electronic instrument						
Medical electronic	6833	-54	9550	40.0	2187341	229times

appliance						
Medical supersonic instrument	1940	-35	1715	-12.0	2110	23.0
Medical laser instrument			86		696	8.1times
Medical bio-chemical instrument	3079		228	-92.6	4634	20.3times
Medical HF, microwave, ray and nuclide instruments			80		94120	1176.5times
Medical HF instrument			80		78	
Medical microwave instrument					93966	
Medical ray instrument					76	
TCM diagnosistic instrument			1692		753	-55.5
Pubic traffic electronic appliance			631598		415199	-34.3
Textile industry electronic appliance	3355	381	3210	-4.0	3575	11.4
Coal industry electronic appliance	735	-91	9951	13.5times	32679	3.3times
Petro-chemical industry electronic appliance	938	16	2631	2.8times	1874	-28.8
Water and power industry electronic appliance	219969	311	83731	-62.0	91098	8.8

Mining and metallurgy industry electronic appliance			48		203	4.3times
Gas industry electronic appliance	75		468	6.2times	555	18.6
Traffic and transportation industry electronic appliance	113162	4.7times	531559	370	285215	-46.3
Culture and education industry electronic appliance	415335	0.3	416465	0.3	13000	-96.9
Other electronic appliance	399677	2.2times	883983	121	1743079	97.2
Electronic ammeter			940000		280000	-70.2
DC ammeter and voltmeter	378800		430000	13.5		
AC ammeter and voltmeter	647600		210000	-67.6	160000	-23.8
Power meter			300000		120000	-60.0
Electronics dedicated ammeter			25080000		21040000	-16.1
Special purpose ammeter	184000		590000	3.2times	380000	-35.6
IC card intelligent ammeter	42416700		2160000	-95.0	14660000	6.8times
IC card intelligent water meter	8022000		30000	-99.6	20000	-33.3
IC card intelligent coal	220100		130000	-41.0	70000	-46.2

gas meter						
IC card intelligent heat meter	203300		10000	-95.0	70000	7times
Others	1363000		22170000	16.3	5850000	-73.6

Table 5. Product export of electronic measurement instrument industry between 2004 and 2005

Product	2004		2005	
	Export volume（set）	Growth rate（%）	Export volume（set）	Growth rate（%）
Digital pulse frequency measurement instrument	168204		1855670	10.3
Analog frequency measurement instrument			40	
Counter			941400	
Frequency standard instrument			889	
Digital multimeter	1833773	14.5	397332	-78.3
Digital storage oscillograph	1000		8000	700
General oscillograph	10377	378	17689	70.5
Dedicated oscillograph			1300	
Microwave filter			28541791	
Broadcasting and TV measurement instrument	6624	33	12545	89.4
DC stabilized power supply	196985	4.9	10565405	53.6times
Power inverter	1000	-99.7	6322551	6322.6times

LF signal source	749	-21.0	530	-29.2
Other signal source	1175356		1222186	4.0
Crystal oscillator			11311991	
Blood testing apparatus			1981000	
Electronic thermometer and pressure meter	95597	-79.9	4520000	47.3times
Supersonic diagnostic instrument	38	-2.1	235	6.2times
Supersonic treatment instrument	11	111.0		
Laser treatment instrument			44	
Medical microwave instrument			30	
Other medical electronic instrument			6747518	
Water and power electronic appliance	4464	5.7times	7002	56.9
Traffic electronic appliance	610	472.0	1810	197
Other electronic appliance	118946	610	207023	74.0
DC ammeter and voltmeter	10000	110		
IC card intelligent ammeter	10000	-100	1630000	163times
Other electronic special power meters			1820000	

Table 6. Main economy indexes of electronic measurement instrument industry between 2003 and 2005

Item	Unit	2003	2004	2005	Growth rate （%）
Gross value of the whole industry（current price）	10,000yuan	430957	551625	744690	35.5
Industrial value added of the whole industry	10,000yuan	137832	168155	218502	29.9
Sales income of the whole industry	10,000yuan	435665	566365	770250	36.0
Pre-tax profit of the whole industry	10,000yuan	46812	60163	75203	25.0
Gross profit of the total industry	10,000yuan	29772	35726	42871	20.0

Remark: data source: Electronic Production Equipment Industry Association (CEPEA).

VIII. Integrated circuit (IC) and semiconductor device industries

1. Overview

In 2005, China's IC and semiconductor device industries maintained the rapid and stable development and made better achievements. The targets of the 10th Five Year Plan were realized a year early.

The rapid growth of national economy and social informatizing course offered the growing opportunities for the sound development of IC and semiconductor device industries. With five-year growth, the achievements were notable.

In 2000, the issuance of No 18 document *Some Policies for Encouraging the Development of the Software Industry and the Integrated Circuit Industry* by the State Council promoted the simultaneous development of China's IC industry and semiconductor device industry and brought them in the best growth period.

In 2005, the investment in IC and semiconductor device industries continued expanding. The capacity increased steadily. The product structure was optimized greatly. The Technical level also improved a lot. The mass production technology in IC industry reached the international advanced level. China can produce 12-inch and 0.11μm IC products. The chip design level reached the multi-million-gate grade. The gap between China and foreign in chip design level was narrowed increasingly. IC design, manufacture, package and test developed harmoniously. IC industrial chain had taken initial shape. Parts of key materials, special equipment and instruments had put into mass production. China's IC industry possessed the primary support capacity. The industry cluster effect became increasingly obvious. China's Yangtze River Delta, Beijing-Tianjin-Bohai Bay and Pearl River Delta had become the major regions where China's IC industry clustered. The sales revenue of these three regions accounted for over 95% of the total sales revenue of China's IC industry. Till November 2005 when Beijing-based Vimicro Corporation and Zhuhai-based Actions Semiconductor Co.,Ltd. were successful listed on the NASDAQ Stock Market in the US, there were ten listed enterprises engaged in semiconductor device industry in China. These listed enterprises were as follows: Semiconductor Manufacturing International Corporation (SMIC), CSMC Technologies Corporation, Shanghai Belling Co.,Ltd., Shanghai Fudan Microelectronics Co.,Ltd., Grinm Semiconductor Materials Co.,Ltd., Hangzhou Silan Microelectronics Co.,Ltd., Jiangsu Changjiang Electronics Technology Co.,Ltd. (JCET), Jilin Sino-Microelectronics Co.,Ltd. (JSMC), Vimicro Corporation and Actions Semiconductor Co.,Ltd..

In 2005, the growth rate of global semiconductor market dropped a lot compared to 28% in 2004. The sales of whole year reached US$ 197.298 billion, a 6.8% increase on a year-on-year basis. The sales from IC market hit US$ 227.484 billion. The sales from discrete devices (including photoelectronic devices) hit US$ 34.686 billion. Impacted by the rapid development of global semiconductor market, China's IC and semiconductor device industries maintained the fast growth in the second half of the year after the turndown in the first half of the year. The sales of whole year reached 131.53 billion *yuan*, an increase of 32%, accounting for 3.8% of domestic sales of the electronic information products manufacturing industry and 7.1% of global sales of semiconductor devices. The number of employees in the industry as a whole reached 277,000, of

which technical stuff were around 60,000, accounting for 21.69% of the total number. The talents worked in fields of design, processing technique, sales, investment, management, trade and technical service.

2. Manufacture and sales

(1) IC industry

IC

In 2005, China's IC chip production lines were full of capacity. The productivity of 6-inch, 8-inch and 12-inch production lines was expanded steadily. The number of the enterprises, which sales revenue of IC design industry exceeded 100 million *yuan*, was 25, increasing eight enterprises compared with last year. The packaging industry had made notable achievements in technical level and output and replaced the development mode dominated by low-level redundant development and simple production-scale expansion step by step. The national guidance and support played an increasing important role in the product research and development. The IC industry had come into the best growth period.

For five years, the investment in IC industry rapidly developed. From 2001 to 2005, the investment amount hit US$ 16 billion, four times of the total investment in the past 30 years. The average growth rate reached 45%. In 2005, the output of IC reached 26.11 billion pieces, an increase of 23.5% and 4.1 times of that in 2001. The average growth rate hit 41.3% for five years. The sales reached 70.21 billion *yuan*, an increase of 28.8% and 3.7 times of that in 2001. The average growth rate hit 41.0% for five years. This figure accounted for 4.5% of the total sales of global IC products in 2005, compared to nearly 1% in 2001. It increased 0.8 percentage points compared to 2004.

IC design, chip manufacturing and packaging test industries developed simultaneously. In 2005, the sales revenue of chip manufacturing industry reached 23.29 billion *yuan*, a 28.5% increase. The sales revenue of IC design industry reached 12.43 billion *yuan*, an increase of 52.5%. The sales revenue of the packaging industry reached 34.49 billion *yuan*, an increase of 22.1%.

The output of ancillary IC used for investment-type machine increased quickly. Its proportion also

increased a lot. The proportion of ancillary IC used for consumption products was ranked the second. IC card chip, ASIC curcuit and SOC-system chip developed fast and became the highlighting of the industry.

IC design industry

According to incomplete statistics, till the end of 2005, the number of IC design units had reached 479, which mainly distributed Beijing-centered Beijing-Tianjing Bohai Bay areas, Shanghai-centered Yangtze River Delta, Shenzhen-centered Pearl River Delta and Xi'an, Chengdu and Wuhan-centered central and western areas. The IC design teams become more and more huge. The number of team members had reached over 20,000 in 2005 from less than 5,000 in 2000. The sales revenue of IC design industry reached 12.43 billion *yuan*, an increase of 52.5% and accounting for 17.7% of the total sales revenue of IC industry in China. The number of enterprises with sales revenue of IC design industry over 100 million *yuan*, were 18, of which five enterprises' sales revenue surpassed 500 million *yuan*. The enterprises with sales revenue over 1 billion *yuan* appeared in China for the first time. From 2001 to 2005, the average annual growth rate of IC design industry hit 68%. With the fast growth of IC design industry and chip manufacturing industry, the professional design and service companies were established to provide IC design companies with new product development, IP core, application service, MPW and after-design service and give chip manufacturers diverse forms of ancillary services including database establishment and IP core development.

In 2000, the sale revenue of IC design industry (excluding the Hong Kong SAR, the Macao and Taiwan) reached 980 million *yuan*. In 2005, the sales revenue reached 12.43 billion *yuan*. The number of enterprises with sales revenue over 100 million *yuan* was 18. The sales revenue of top ten IC design enterprise accounted for 41.6% of sales revenue of IC design industry. From 2001 to 2005, the average growth rate hit 67.8%, higher than that of the IC industry——31.18%，that of the manufacturing industry——57.2% and that of the packaging industry——22.1%. The proportion of the IC design industry increased from 5.3% of the whole industry in 2000 to 17.7% in 2005.

Chip manufacturing industry

China has made the chip manufacturing industry become the investment focus of the IC industry in recent years. Until the end of 2005, the Chinese mainland had put ten 8-inch chip production lines and one 12-inch chip production line into operation. During the 10th Five Year Plan, the total investment in chip manufacture reached around US$ 16 billion *yuan*. The production lines were mainly established in form of standard processing line (Foundry). At present, the total capacity of the chip production lines put into operation reached around 650 thousand pieces/per month.

Shanghai-based SMIC has been one of the fastest developed enterprises in recent years. SMIC has established plants in Shanghai, Tianjin and Beijing and possessed four 8-inch chip production lines including one production line applying 0.13μm standard copper wiring manufacture processing. Beijing-based SMIC has put 12-inch production line into operation. The highest processing level of the production line reached 0.11μm. The capacity hit 20,000-piece/per month. The production has reached full load. The rate of finished products has increased steadily. SMIC provides Infineon Technologies (Wuxi) Co.,Ltd., ELPIDA Memory and other companies with memory products and undertakes the processing order of the chip design companies. Chengdu-based chip packaging test plant has been put into operation. This plant is ranked the third place in the World Top Ten in semiconductor foundry enterprises.

Shanghai Hua Hong NEC Electronics Co.,Ltd. is the first enterprises possessing 8-inch IC production lines in China. Shanghai Hua Hong NEC Electronics Co.,Ltd. has been put into operation since 2000. Since then, it has transferred its operation mode from memory products manufacture to standard processing production lines (foundry). Its processing level developed by its own efforts reached 0.25-0.18μm. Its production lines possess multi-kinds of processing modules. The production capacity has increased from 20,000 pieces to 50,000 pieces monthly. The comprehensive quality rate of the entire production lines reached the international advanced level. On basis of bring in advanced technologies, it depends on its own force to establish the technical improvement department and talents team. In 2005, the sales revenue reached 2.4 billion *yuan*, an increase of 9%. The foreign exchange reached US$ 240 million. It has been ranked the seventh place among the World Top Ten in semiconductor foundry enterprises for three consecutive years.

HeJian Technolgy (Suzhou) Co.,Ltd. was an 8-inch IC foundry enterprise, which was put into

operation in 2004. In 2005, its production capacity reached 50,000 pieces per month. It undertook the processing businesses of some chip design companies at home and abroad. The domestic business accounted for 15% of the total businesses. In 2005, the 8-inch production line of TSMC (Shanghai) was put into mass production. Its production capacity reached 40,000 pieces per month.

IC packaging and testing industry

The packaging industry needed by China's IC industry developed relatively steadily and was the lead in domestic IC industry. In 2005, the sales revenue of the packaging and testing industry reached 34.49 billion *yuan*, an increase of 22.1% and accounting for 49% of the total sales revenue of the IC industry. At present, China's IC packaging and testing industry has become a large-scale production base located mainly in Shanghai, Tianjin, Beijing, Jiangsu and Guangdong. Some large international IC manufacturers have established IC packaging plants, which are joint ventures or solely foreign-owned enterprises. In order to improve the level of IC packaging technology and change the growth mode merely depended on expanding the production scale, many enterprises developed the new products on basis of the market demand. The new packaging modes that had been put into operation included BGA, MCP, SSOP/TSSOP, TPQFP, COF and none-touching IC card chip module. The technical content and added value of the products were increased continuously.

(2) Discrete semiconductor device industry

At present, China's discrete semiconductor device industry has possessed certain industrial scale. There are 200 enterprises engaged in the production of discrete devices in China. The employed persons are around 80,000, of which 20,000 are technical personnel. Until the end of 2005, there were 21 above 4-inch discrete semiconductor device and chip production lines completed or under establishment. The production capacity of discrete device chip production line reached 30,000 pieces per month. In 2005, there were over 20 enterprises with output of discrete devices above 1 billion pieces. The sales revenue of domestic largest semiconductor triode manufacturer——Jiangsu Xinchao Technology Group Co.,Ltd.——reached 1.468 billion *yuan*. The sales revenue of the domestic largest semiconductor diode manufacturer——Leshan-Phoenix

Semiconductor Co.,Ltd.——reached 1.336 billion *yuan*. The sales revenue of the domestic largest discrete semiconductor device triode manufacturer——Jilin Sino-Microelectronics Group Co.,Ltd.——reached 521 million *yuan*. In 2005, the output of China's discrete semiconductor devices hit 129.49 billion pieces, an increase of 23.4%. The sales revenue reached 61.32 billion *yuan*, an increase of 35.9% and accounting for 21.8% of total sales revenue of global discrete devices (including photo electronic devices and sensing devices).

The power electronic device is an important part of semiconductor devices. In 2005, China's power electronic device industry still maintained rapid development. The production scale was further expanded. The production structure was adjusted accordingly. The new product development quickened its steps. The quality management level was improved a lot. The economic operation was in sound situation and developed steadily. The China's power electronic device industry made better economic return. The output of the power electronic devices produced by 31 enterprises taking part in the annual industrial statistics reached 557.54 million pieces, of which 564.21 million pieces were sold and 20 thousand pieces were exported. The sales revenue reached 1.54 billion *yuan*, an increase of 24.8%. The export turnover hit 96.51 million *yuan*, an increase of 20%.

3. Scientific development and new products

In 2005, China made great achievement by self-innovation in IC industry. Some new products had entered into domestic and foreign markets and yielded sound economic returns. The enterprises engaged in new technology development poured in. By giving top priority to complete machine products, enterprises integrated the market demand, core technology development and application together in order to do well work in market accession. On basis of the encouragement of industrial policies and the support of technological innovation projects, the Xingguang series of digital multimedia chips developed by Vimicro Corporation was awarded the National Science and Technology Advanced Prize (first prize). X-wall——a kind of kilomega line-speed firewall chip—— developed by Sichuan-based Nan Shan Bridge Co.,Ltd. and the digital TV receiver channel coding and decoding chip developed by Hangzhou Guoxin Science& Technology Co.,Ltd.

are awarded the Prize of the Ministry of Information Industry for Key Technical Invention respectively in 2005.

In 2005, China Resources Microelectronics limited developed 156 types of IC and semiconductor devices, of which 95 types of products had been put into operation. China Resources Microelectronics limited had won 92 prizes of provincial–level science & technology advance prizes. The processing includes bipolar, CMOS, BiCMOS and other techniques. The line width of processing techniques was improved a lot. 300---500A/600---2500V high power fast recovery diode developed by Beijing Jing Yi Chunshu Rectifier Co.,Ltd. had passed the authentication of Beijing Municipal Science &Technology Commission.

4. Important engineering and key projects

Semiconductor lighting engineering

In June 2003, Ministry of Information Industry actively promoted the development of semiconductor lighting industry after the startup of "national semiconductor lighting engineering". In 2005 when distributing the development projects, Ministry of Information Industry encouraged enterprises to research and develop the key packaging technologies and products in LED used for semiconductor lighting. Xiamen Hualian Electronic Co.,Ltd. , Zhenjiang-based Wenrun Optoelectronic Co.,Ltd. and Shijiazhuang Lide Technology Co.,Ltd. received the capital support.

In November 2005, "Semiconductor Lighting Technology Working Group" of Ministry of Information Industry was established in Beijing. The secretariat was located in China Electronics Standardization Institute of Ministry of Information Industry. The working group was composed of Ministry of Information Industry, Ministry of Science and Technology, Luminescent Device Branch of COEMA, enterprises, institutes and institute of higher learning. There were 45 members in Luminescent Device Branch of COEMA. In accordance with the need of national industrial development, the working group made the recent and future working plan.

Mobile Communications

In 2005, among the mobile communication research and development projects, the TD-SCDMA baseband chips used for cellphone developed by Spreadtrum Communications

(Shanghai) Inc had been put into mass production and yield notable economic returns.

5. Industrial management

Compilation of special planning

Under the general disposition of National Development and Reform Commission and in accordance with the general requirements of Ministry of Information Industry as well as on basis of the suggestions of experts and enterprises, the compilation work of the 11th Five Year IC Industry Special Planning (approval copy) and “the 11th Five Year” IC Industry Investment Guide had been completed in December 2005.

Implementation of industrial policies

Under organization of National Development and Reform Commission, Ministry of Information Industry actively took part in the compilation work of Some Policies on Further Encouraging Software and IC Industry Development and the first-phase preparations on the legal system of industrial policies. It also carried out No 18 document issued by State Council and the authentication work of IC-related enterprises. Until the end of 2005, Ministry of Information Industry had finished three batches of authentication work on 209 IC design enterprises. In order to improve the self-innovation ability of IC enterprises, the state established the special fund on IC research and development. This special fund was used for support the technological innovation work of IC enterprises.

The auxiliary work on industrial supporting mechanism

Ministry of Information Industry supported the relevant work made by China Software and Integrated Circuit Promotion (CSIP) Center. The CSIP Center of Ministry of Information Industry actively promoted the application of IC IP core and quickened the step of international cooperation as well as improved the research and service in IC intellectual property rights. The CSIP Center also supported the work of China Semiconductor Industry Association, China Electronics Materials Industry Association and China Optics and Optoelectronics Manufactures Association. The CSIP Center also gave support to the third session of China International IC Industry Expo & Conference, which is held by China Semiconductor Industry Association in

Beijing in August 2005.

6. International cooperation and foreign trade

Chip was the basis of the IC industry. In order to develop and possess the key technology of IC chip manufacture processing and change the situation that the industrial technology depended on import, domestic relevant enterprises began to develop the key scientific and technological projects with the relevant departments. For example, in 2000, Shanghai Huahong Group Co.,Ltd. started the "Deep Submicron Digital CMOS Technological Development" Project in open R&D manner. Shanghai Huahong Group Co.,Ltd. developed the processing and enjoyed the intellectual rights jointly with IMEC of Catholic University of Louvain. The 0.25μm and 0.18μm key processing techniques developed by them jointly had been used for the 8-inch production line of Shanghai Hua Hong NEC Electronics Co.,Ltd.. This project had won 34 international patens. China Patent Office had accepted 102 applications for patent. The projects had won 26 patent sin China.

With the rapid development of China semiconductor industry, internationally-known semiconductor enterprise intensified their business in China. In 2005, Lixin Semiconductor Company established 8-inch and 0.25μm chip production line applying BCD processing in Shanghai Zizhu Science-Based Industrial Park. Its production capacity reached 20, 000 pieces/per month. The IC Packaging Plant established by SMIC in Chengdu had been put into operation. In Wuxi, South Korea's Hynix and Europe's ST jointly invested in the construction of 8-inch and 0.25μm IC production line used to produce all kinds of memory products. This production line was still under construction. Micron Semiconductor Technology invested US$ 250 million to establish semiconductor memory packaging plant in Xi'an. In addition, many 8-in and 12-inch IC chip production lines were under preparation.

IC import and export trade

In 2005, the imported IC reached 75.37 billion pieces, an increase of 20%. The import value reached US$ 81.02 billion, an increase of 34.9%. The exported IC reached 21.61 pieces, an increase of 33.2%. The export value reached US$ 13.75 billion, an increase of 30.7%. The trade

deficit of China's IC industry hit US$ 67.27 billion, an increase of 50.8%.

In view of the area distribution of import trade, in 2005, Taiwan became the largest IC imported region. The import value reached US$ 18.55 billion, accounting for 22.9% of the total import value of that year. South Korea became the second largest IC imported countries. The import value reached US$ 14.34 billion, accounting for 17.7% of total IC import value. Malaysia became the third largest IC imported countries. The import value reached US$ 9.56 billion, accounting for 11.8% of total IC import value. Japan was the forth-largest IC imported country. Its import value reached US$ 9.24 billion, accounting for 11.4% of total IC import value. Hong Kong SAR became the largest IC exported region. Its export value reached US$ 4.84 billion, accounting for 35.2% of the total IC export value. Singapore was the second largest IC exported country. Its export value reached US$ 1.53 billion, accounting for 11.1% of the total IC export value. South Korea was the third largest IC exported country. Its export value reached US$ 1.49 billion, accounting for 10.8% of the total IC export value. The US was the fourth largest IC exported country. Its export value reached US$ 1.4 billion, accounting for 10.2% of the total IC export value.

Import and export trade of semiconductor discrete devices

In 2005, China's import and export trade in semiconductor discrete devices had increased a lot. The imported discrete devices reached 205.43 pieces, an increase of 18.6%. Import value reached US$ 11.02 billion, an increase of 48.5%. The exported discrete devices reached 178.69 pieces, an increase of 24.9%. The export value hit US$ 4.18 billion, an increase of 72%. In 2005, the China's trade deficit in semiconductor discrete devices hit US$ 6.84 billion, an increase of 37.1%.

Japan and Taiwan have always been the largest import sources of semiconductor discrete devices of China. In 2005, Japan was the largest imported country of semiconductor discrete devices. Its import value reached US$ 3.02 billion, accounting for 27.4% of total import value of semiconductor discrete devices. Taiwan was the second largest imported region of China of semiconductor discrete devices. Its import value reached US$ 1.79 billion, accounting for 16.3% of total import value of semiconductor discrete devices. South Korea was the third largest imported country of semiconductor discrete devices. Its import value reached US$ 870 million, accounting for 7.9% of total import value of semiconductor discrete devices. Malaysia was the

fourth largest imported country of semiconductor discrete devices. Its import value reached US$ 740 million, accounting for 6.8% of total import value of semiconductor discrete devices. The import value of abovementioned four countries and regions hit US$ 6.42 billion, accounting for 86.5% of total domestic import value of semiconductor discrete devices.

The domestic export of semiconductor discrete devices mainly relied on Hong Kong SAR's entrepot trade. In 2005, Hong Kong became the largest exported region of semiconductor discrete devices. Its export value accounted for 47.7% of total export volume of semiconductor discrete devices and 34.6% of the total export value of semiconductor discrete devices. Then were Taiwan region, Germany, South Korea, Japan and Singapore.

7. Market analysis and forecasting

By a push of the rapid growth of demand and supply of global complete machine products such as computer, network, mobile communication and digital home appliance, in 2005, the market need of China's IC and semiconductor devices increased quickly. The market scale reached 473.7 billion *yuan*, an increase of 26%. The market scale of IC reached 380 billion *yuan*. The market scale of semiconductor devices reached US$ 93.7 billion. Compared with 2004, although the growth rate became a little slow, the total volume and growth rate still maintained the momentum of increase. In 2005, IC and semiconductor devices accounted for 25.7% of the global market share, a 3.6 percentage point increase on a year-on-year basis, and became the third largest IC market just behind the US and Japan. In 2005, both China's IC market demand and supply thrived. The export volume increased rapidly. The import volume and import value increased especially fast.

It was estimated that the development of China's IC industry would show the following characteristics: SOC would become the main growth field; four application fields such as digital TV, mobile communication, computer, network and information security would drive the rapid growth of IC market and bring new development opportunities to IC industry; IC card, electronic label, semiconductor lighting and power electronic devices would become the new economic growth point.

The coming five years will become the best development period for IC and semiconductor device industry. Domestic market will still maintain the rapid growth. The average annual increase will be maintained around 30%. In 2006, the market scale of China's IC market would increase 31% to 450 billion *yuan*. The market demand would be around 80 billion pieces. Till 2010, the market scale will hit 1, 000 *yuan*, of which market scale of IC will reach 830 billion *yuan* and semiconductor devices will reached 170 billion *yuan*. Then, China will become the second largest IC market in the world.

【Statistical data】

Table 1 Industrial scale of IC and semiconductor devices industry in 2005

Type	Number of enterprises	Total number of personnel	Including: technical staff	Ratio of technical staff to total number of personnel
IC	899	197808	40000	20.22
Semiconductor devices	728	79637	20000	25.11
Total	1627	277445	60000	21.63

Table 2 Actual performance of main economic parameters of IC and semiconductor devices industry from 2003 to 2005

Name of items	Units	Year 2003	Year 2004	Year 2005	Growth rate(%)
Sales revenue of IC	100,000,000 *yuan*	351.4	545.3	702.1	28.8
Output of IC	100,000,000 pieces	124.1	211.5	261.1	23.5
Sales revenue of semiconductor devices	100,000,000 *yuan*	336	451.2	613.2	35.9
Output of semiconductor devices	100,000,000 pieces	777.3	1049.4	1294.9	23.4

Table 3 Sales revenue of China Top Ten IC Design Enterprises in 2005

2005 ranking	Name of enterprises	Sales revenue （10, 000 *yuan*）	Growth rate （%）	2005 ranking
1	Actions Semiconductor Co.,Ltd.	125750	173.4	3
2	Vimicro Corporation	76822	82.9	5
3	China Huada Integrated Circuit Design (Group) Co.,Ltd.	64075	41.0	4
4	Hangzhou Silan Microelectronics Co.,Ltd.	60577	19.1	2
5	Datang Microelectronics Technology Co.,Ltd.	57234	-23.7	1
6	Shanghai Hua Hong NEC Electronics Co.,Ltd.	37330	95.4	9
7	Hangzhou Youwang Electronic Co.,Ltd.	25061	1.6	7
8	Shaoxing Silicore Technology Co.,Ltd.	23397	-7.4	6
9	Beijing Tongfang Microelectronics Co.,Ltd.	23214		
10	Wuxi China Resources Semico Co.,Ltd.	22830	Even	8
	Total	516290		

Table 4 Sales revenue of Chinese major enterprises engaged in IC chip manufacture in 2005

No	Name of enterprises	Sales revenue（10, 000 *yuan*）
1	SMIC	1171400

2	Shanghai Hua Hong NEC Electronics Co.,Ltd.	241217
3	HeJian Technolgy (Suzhou) Co.,Ltd.	217000
4	SGNEC	110051
5	Advanced Semiconductor Manufacturing Corporation Limited	89600
6	Grace Semiconductor Manufacturing Corporation	85375
7	Wuxi China Resources Huajing Micro Electronics Co.,Ltd.	83622
8	CSMC Technologies Corporation	60300
9	JSMC*****	52147
10	Suzhou Good-Ark Electronics Co.,Ltd. *****	37771
	Total	2148483

Remarks: * refers to discrete device enterprises

Table 5 Sales revenue of China Top Ten Enterprises engaged in chip packaging and testing in 2005

No	Name of enterprises	Sales revenue （10, 000 *yuan*
1	Freescale Semiconductor (China) Limited	626238
2	RFMD (Beijing)	292714
3	STS Microelectronics (Shenzhen)	289080
4	Intel Products (Shanghai) Co.,Ltd.	182100
5	Shanghai Matsushita Semiconductor Co.,Ltd.	178829
6	Nantong Fujitsu Microelectronics Co.,Ltd.	176224
7	Infineon Technologies Suzhou Co.,Ltd.	159481
8	Renesas Semiconductor (Beijing) Co.,Ltd.	156269
9	JCET	146800
10	Leshan-Phoenix Semiconductor Co.,Ltd. *****	133584
	Total	2341319

Remarks: * refers to discrete device enterprises.

Table 6 Actual performance of main economic parameters of China' s IC industry from 2000 to 2005

Name of parameters	Year 2000	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005
Sales revenue of IC industry （100,000,000 *yuan*）	186.2	203.6	268.5	351.4	545.3	702.1
Sales revenue of IC design industry （100,000,000 *yuan*）	9.8	14.8	21.6	44.9	81.8	124.3
Sales revenue of IC manufacturing industry（100,000,000 *yuan*）	48.0	27.7	33.6	60.5	180.0	232.9
Sales revenue of IC packaging and testing industry （ 100,000,000 *yuan*）	128.4	161.1	213.3	246.0	283.5	344.9
Growth rate of IC design industry （%）	227	51.0	46.0	107.9	82.2	52.0
Ratio of sales revenue of IC design industry to that of IC industry（%）	5.3	7.3	8.0	12.8	15.0	17.7
Growth rate of manufacturing industry（%）	114.0	-42.3	21.3	80.1	197.5	29.4
Ratio of sales revenue of manufacturing industry to that of IC industry（%）	25.8	13.6	12.5	17.2	33.0	33.2
Growth rate of IC packaging and testing industry（%）	155.0	25.5	32.4	15.3	15.2	21.7
Ratio of sales revenue of IC packaging and testing industry to that of IC industry（%）	69.0	79.1	79.4	70.0	52.0	49.1
Output of IC（100,000,000 pieces）	58.8	63.6	96.3	124.1	211.5	261.1

Growth rate of sales revenue of IC industry（%）	133.8	9.1	31.9	30.9	55.2	28.8
Ratio of IC industry to electronic information product manufacturing industry（%）	3.2	2.3	1.92	1.87	2.1	2.1
Ratio of market share of China's IC industry to that of global IC market（%）	1.2	1.9	2.68	3.0	3.7	4.4

Table 7 Top Ten Enterprises in sales revenue of power electronic devices in 2005

No	Name of enterprises	Sales revenue（10,000 *yuan*）	Growth rate（%）
1	Beijing AriTime Intelligent Control Co.,Ltd.	30042	64.6
2	Xi'an Jieli Electric Technology Co.,Ltd.	22840	245.5
3	Yangzhou Jinglai Semiconductor (group) Co.,Ltd.	21936	4.8
4	Tianjin Huan-ou Semiconductor Material Technology Co.,Ltd.	14097	84.0
5	Xi'an XD Power Rectifier Company Limited	13800	0.7
6	Power Electronics Department of Zhuzhou CSR Times Electric Co.,Ltd.	13336	1.3
7	Jiujiang Rectifier Factory	5027	2.7
8	Beijing Jing Yi Chunshu Rectifier Co.,Ltd.	4605	26.3
9	Qingdao Semiconductor Research Institute	2396	60.7
10	Hebei Huazheng Industry Co.,Ltd.	2079	27.3

Table 8 Top Ten Enterprises of electric and electronic products in 2005

No	Name of enterprises	Output（10,000	Domestic sales	Foreign sales volume

		pieces）	volume（10, 000 pieces）	（ 10, 000 pieces）
1	Yangzhou Jinglai Semiconductor (group) Co.,Ltd.	55106.7	55742.4	13.1
2	Yangzhou Siling Electronics Co.,Ltd.	353.8	396.2	
3	Danyang Thyristor Factory	63.3	67.3	
4	Kunshan Transistor Second Factory	62.2	59.9	
5	Zhejiang Guidu Power Electronics Co.,Ltd.	44.9	29.6	
6	Danyang Weisite Rectifier Co.,Ltd.	34.9	34.8	
7	Yixing Shunda Ceramic Tube Package Co.,Ltd.	34.5	30.3	4.2
8	Power Electronics Department of Zhuzhou CSR Times Electric Co.,Ltd.	14.9	13.9	0.5
9	Xi'an Jieli Electric Technology Co.,Ltd.	6.2	6.4	
10	Qingdao Semiconductor Research Institute	4.8	4.0	

Table 9 Import and export trade of IC and semiconductor devices products from 2003 to 2005

Name of enterprises	Unit	Year 2003		Year 2004		Year 2005	
		Export value	Import value	Export value	Import value	Export value	Import value
IC	100, 000, 000 dollars	57.0	404.0	100.0	546.2	137.5	810.2
	Growth rate（%）	26.8	58.3	75.4	35.2	37.5	48.3

Semiconductor devices	100, 000, 000 dollars	17.0	57.0	24.3	74.2	41.8	110.2
	Growth rate（%）	25.8	21.2	42.9	30.2	72.0	48.5

Remarks: * Date Source: China Customs.

Table 10 Import and export volume of IC and semiconductor device products from 2003 to 2005

Name of enterprises	Unit	Year 2003		Year 2004		Year 2005	
		Export value	Import value	Export value	Import value	Export value	Import value
IC	100, 000, 000 pieces	135	419	137.5	583.7	216.1	753.7
	Growth rate（%）	28.3	39.7	1.9	39.4	56.5	29.1
Semiconductor devices	100, 000, 000 pieces	1033	1353	1430.3	1731.7	1786.9	2045.3
	Growth rate（%）	16.7	26.9	38.4	28.0	25.0	18.1

Remarks: * Date Source: China Customs.

Table 11 Import and export of domestic IC in 2005

Name of items	Import and export scale	Import scale	Export scale	Deficit value
Volume （ 100, 000, 000 pieces）	969.8	753.7	216.1	537.6
Growth rate（%）		20.0	33.1	
Amount （ 100, 000, 000 dollars）	947.7	810.2	137.5	672.7
Growth rate（%）		34.9	30.7	50.8

Remarks: * Date Source: China Customs.

Table 12 Import and export scale of domestic discrete devices in 2005

Name of items	Import and export scale	Import scale	Export scale	Deficit value
Volume （ 100, 000, 000 pieces）	3832.2	2045.3	1786.9	258.4
Growth rate（%）		18.6	24.9	
Amount （ 100, 000, 000 dollars）	152	110.2	41.8	68.4
Growth rate（%）		48.5	72	37.1

Remarks: * Date Source: China Customs.

Table 13 Global IC market forecasting from 2005 to 2010

Monetary unit: 100, 000, 000 dollars

Year	2004	2005	2006	2007	2008	2009	2010
Predicted market amount	1781.3	1941	1918	2070	2450	3000	3450
Growth rate（%）	27.3	8.0	-1.2	8.0	18.0	22.0	15.0

Remarks: growth rate from 2005 to 2006 is the predicted data of WSTS. Data from 2007-2010 are predicted data of CCID Microelectronics Consulting Group.

IX. Vacuum electron device industry

1.Overview

In 2005, China's vacuum electron device industry first showed industry-wide losses in its history. The reason is that, on one hand, the maturity of the technology of flat panel display, lower costs and lower prices narrowed the development space of color picture tube; On the other hand, the

excess production capacity of the color picture tube and the lowering prices for competition have caused the total industrial output value of more than 80% large enterprises engaging in color picture tube and auxiliaries showed a decline or losses, leading to overall fall of the industry-wide major economic indicators.

By the end of 2005, the enterprise structure of China's vacuum electron device industry showed little change, still 83 enterprises. However, with the deterioration of the business environment, and the growing number of loss-making enterprises, the personnel structure has changed a lot. There were 123,539 employees in the vacuum electron device industry thoughout the year, a year-on-year decrease of 7%. 17,264 of which were technical staff, cutting 5.4 percent; 10,227 managements, cutting 6.1 percent; 96,048 workers, cutting 7.4 percent. It is obvious that except the retirement, each unit tries to maintain its strength of the development team as far as possible and to reduce management staff appropriately. The reduction extent for work force is relatively larger.

In 2005, the gross industrical output value of the vacuum electron device industry reached 64.26571 billion yuan, a year-on-year decrease of 24.1 percent; the sales income reached 63.81183 billion yuan, a decrease of 18.7 percent; the profit and tax were 2.32361 billion yuan; the loss of loss-making enterprises was 1.35105 billion yuan; the profit payments and tax turnover were 972.56 million yuan after set-off of profits and losses, a drop of 85.8 percent; the total taxes achieved 1.13623 billion yuan, a drop of 43.6%, and the total profit was 1.24806 billion billion yuan of profits.The whole industry was in the difficulties of losses.

2.Production and sales

In 2005, China's total output of vacuum electron devices was 271.62 million, a increase of 4.4 percent compared with 260.2 million of the previous year; the output of tubes accessories (glass bulb, aperture mask) was 196.38 million, a decrease of 3.1 percent; light sources was 157.93 million, a drop of 10.5 percent; the output of Color Picture Tube (CPT) was 65.45 million, a 1.2% decrease; Color Display tube (CDT) was 20.72 million, a 35.4% decrease; CPT glass bulb was 84.68 million units, a 9.9 percent decrease; CPT aperture mask was 87.22 million, a 5.8%

decrease.

In terms of the production of CPT and its supported products, in 2005, the profit and tax of many enterprises declined greatly due to the price fall and the price soaring of raw materials, and the industry-wide losses appeared. However, some joint venture enterprises and aperture mask enterprises with strong technical reserves, wide variety and greater international market still made profit despite of narrowed profit margins. According to the statistics from the Ministry of Information Industry, the sales volume of China's color TV was 81.87 million sets in 2005, of which, the sale volume of CRT color TV was 75.98 million sets, accounting for 92.8% of the total TV sales; the sales volume of PDP color TV was 700,000 sets, accounting for 0.9 percent of the total TV sales; the sales volume of LCD color TV was 4.21 million sets, accounting for 5.1 percent of the total TV sales; the sales volume of projection color TV was 980,000 units, accounting for 1.2%. It is obviously that the CRT color TV still occupies a dominant position in China's color TV market is still the dominant position. For this reason, CPT enterprises must adjust the product structure, enhance technological development and launch better cost-performance products to meet the market demand.

In terms of the production of black and white picture tube, the production and sales volume of the industry declined greatly in 2005. The output of black and white picture tube was 7.39 million, a 50.3 percent decrease; black-and-white glass bulb was 24.48 million sets, up 53.0%; black-and-white electron gun was 17.07 million, a 15.2 percent decrease.

From what has been mentioned above, we can come to the conclusion that the profit of this industry in 2005 was very small and the operation was under difficult conditions. The total industrial output value was 310 million Yuan and the sales income was 320,000 million Yuan. The tax and profit were 16.02 million Yuan and the export was 25.16 million US dollars. The largest scale enterprise was Tianjin Jin-jing Glass Bulb Co., Ltd. and the electron gun branch factory of Changsha Shuguang Electronics Group Co., Ltd.

In terms of the production of vacuum switch tube, in recent years, China's vacuum switch tube industry has shown rapid growth. According to the statistics for 20 enterprises from the industry association, the output of vacuum switch tube was 1.89 million in 2005, an increase of 26.0%; the

sales volume was 1.75 million, up 18.2 percent; the production and sales rate reached 92.6%. Among the enterprises producing above 6 kV high-voltage vacuum switch tube in China, Shaanxi Baoguang Vacuum Electric Device Co., Ltd. ranked the first place with the output of 200,000, followed by the Chengdu Xuguang Electronics Co. Ltd. with the output of 156,000; and the third one is China Zhenhua (Group) Science & Technology Co., Ltd. Yuguang Branch with the output of 145,000, the fourth one is Jinzhou Huaguang Electric Power & Electron (group) Company with the output of 115,000. Among enterprises producing low-pressure vacuum switch tubes, Wenzhou Star Electronics Co., Ltd. ranked the first place with the output of 530,000, followed by Zhejiang Baoguang Electric Co., Ltd. with the output of 165,000; and the third one is Kunshan Guoli Vacuum Electric Co., Ltd. with the output of 163,000.

In terms of the production of vacuum switch tube and its auxiliaries, the large-scale ceramic enterprises include Guangdong Tai Po special Ceramics Co., Ltd., Jinzhou metal ceramics factory and Sichuan Yibin Jinyang Ceramics Factory; the large-scale enterprises engaged in supply of corrugate pipe include TianHua Bellows Co. Ltd and Shaan'xi Sirui Industries Co., Ltd. with the supply of various contact materials accounting for more than 70 percent of the whole industry. In 2005, the gross industrial output value of switch tube and auxiliaries production enterprises achieved 2.51 billion, a decrease of 13.4%; the sales income achieved 2.03 billion yuan, up 8.6 percent; the profit and tax were 210 million yuan, reflecting a 30 percent decrease. Clearly, as the development of the market, the production and sales volume both showed substantial growth, and the sales revenue increased slightly. However, due to the price fall and the soaring price of raw materials, the profits declined greatly which was not conducive to the sustainable development of enterprises. Therefore, the entire industry should regulate the market so as to avoid disorderly competition, expand the market of high voltage and ultrahigh voltage to promote the development of vacuum switch industry.

In terms of the production of vacuum tube, China’s production of vacuum tube mainly includes the production of receiving amplifier tube, transmitting tube and UHF electronic tube, etc. In 2005, the output of China’s vacuum tube reached 18.82 million, an increase of 2.3 percent; the sales volume reached 19.08 million, an increase of 8.0%; the rate of production and marketing reached

101.4 percent. The output of receiving amplifier tube reached 1.06 million, an increase of 55.9%; the sales volume was 1.01 million, an increase of 17.4 percent, and rate of production and marketing reached 95.3%. The radio transmitting tube of the radio and television market is relatively stable. The transmitting tube used for industrial heating medium promoted the sales growth of the transmitting tube with sales volume increase of 100 percent over the previous year; the UHF electronic tube (also called microwave tube) is the high-end product in the vacuum electron devices with advanced technical content, which is mainly used for the microwave stove but a small amount of which are used for the state's key projects. In 2005, the output of continued-wave magnetron was 17.56 million, the same as last year; the sales volume was 17.89 million, an increase of 7%.

In terms of the production of ironic tube, China's ironic tube is mainly used for the production of overvoltage protection luminous discharge tube of telecommunications industry. In 2005, China's output of the ironic tube was 100.59 million, an increase of 61.8%; the sales volume was 96.39 million, an increase of 59.2%. A few years ago, it was predicted that the ironic tube would be replaced by solid device, which once caused a market decline. Several years later, the practice has proved that it has not been totally replaced, but also showed upward trends.

In terms of the production of Vacuum Fluorescent Display (VFD), the output of China’s VFD was 56.72 million, a 12.5% decrease; the sales volume was 56.07 million, a 11.3 percent decrease, and the rate of production and marketing reached 98.9%. At present, there are a dozen enterprises engaging in the production of vacuum display. Of which, Beijing Orient Vacuum Electronic Co., Ltd. ranks the first place with the output of 19.9 million, a 17.1 percent decrease; and the sales volume was 19.3 million, a 16.1 percent decrease. followed by the Shanghai Samsung Vacuum Electronic Devices Co., Ltd. with the output of 28.97 million, an increase of 2.4 percent; the sales volume was 29.62 million, an increase of 5.8%; and the rate of production and marketing reached 102.2 percent. In addition, the production and sales volume of Changsha Shuguang Electronics Group and Changzhou Yidali Electronics Co., Ltd. both reached 3 million. In recent years, as the market competition of other types of flat-panel display, the VFD market also faces challenges, resulting in the decline of production and sales volume of VFD in 2005.

In terms of the production of electric light source, there are many enterprises engaging in the production of electric light source in China, mainly distributed in all regions and departments, but only enterprises specializing in the production of special electric light source products are brought into the statistics ofhe Ministry of Information Industry. In 2005, the output of electric light source was 157.93 million, a 10.5 percent decrease; the sales volume was 149.52 million, a 7.3 percent decrease; and the rate of production and marketing reached 94.7%. Among them, the output of high-pressure sodium lamp was 2.27 million, a 61.7 percent decrease; the sales was 2.09 million, a 61.0 percent decrease; and the rate of production and marketing reached 92 percent. The output of automotive lamp was 7.75 million, an increase of 13.0%; the sales volume was 8.18 million, up 37.9 percent; and the rate of production and marketing reached 105.6 percent. The output of energy-saving lamps was 61.64 million, a 6.9% decrease; the sales volume was 58.97 million, a 5.8% decrease; and the rate of production and marketing reached 95.7%. The output of fluorescent light was 86.27 million, a 11.5 percent decrease; the sales volume was 80.82 million, a 7.5 percent decrease; and the rate of production and marketing reached 93.7%. It was obviously that only the output of automotive lamp increased considerably, and other light sources have different degrees of decline.

3.Scientific research and new products development

In 2005, 50 scientific research and new product development projects of China's vacuum electronics industry passed the identification at provincial and ministerial levels, a decrease of 10.7 percent. Among which, 24 projects in the microwave (UHF tube) 24, a decrease of 4 percent, accounting for 48 percent of the total projects; 5 projects in vacuum switch tube, a drop of 58.3%, accounting for 10% of the total projects; 3 projects in flat panel display, a 57.1% decrease, accounting for 10 percent of the total; 3 projects in CPT, the same with last year; 2 projects in electric light sources, and 8 projects of other types of products.

The electronic microwave tube mainly includes magnetron, TWT, klystron and duplexer tube, which belongs to the high-tech industry in the vacuum electronics industry, and occupies an extremely important position in the national key projects. In 2005, in addition to the continuous

wave magnetron had achieved large scale production, other type of tubes are still in preparation stage. 24 scientific research results have passed provincial and ministerial identification, accounting for 48 percent of the total projects of new products development. The technology of vacuum switch tube within the scope below 40.5 kV is relatively mature and have already entered the industrialization stage, and gradually reduce the projects, completed in 2005, five new product development projects, and 58.3% decrease. At present, the development of new products mainly concentrated in the high voltage vacuum switch tube above 72.5 kV. For example: Wenzhou Baoguang Electric Group is developing 72.5 kV vacuum switch tubes and circuit breakers, Shaanxi Baoguang Electric Group and Wenling Ziguang Electrical Co. Ltd. have developed 126 kV vacuum switch tubes, the detection parameters are qualified and are still in the pilot phase

In 2005, China has 5 development items of vacuum tube. The main development object was photomultiplier tubes, which were still in the research preparation stage and had not yet entered mass production; there were 3 development items of flat panel display research, a 57.1% decrease.

4. International cooperation and foreign trade

According to the statistics from China Chamber of Commerce for Import and Export of Machinery and Electronic Products, China's import and export trade volume of the vacuum electronics industry was 5.96 billion US dollars in 2005, a 9.8% decrease. The imports amounted to 2.7 billion US dollars, a 25.6 percent decrease; and the exports amounted to 3.25 billion US dollars, an increase of 9.1%. Although China's foreign trade volume decreased in the vacuum electronics industry, but the exports continued to grow, and achieved trade surplus for the first time, with the surplus value of 550 million US dollars.

In terms of the CPT, in 2005, the import volume of CPT was 18.38 million, a 23.4 percent decrease; imports amounted to 650 million US dollars, a decrease of 36.3%. The export volume was 19.52 million, a decrease of 7.6%; the exports amounted to 800 million US dollars, a decrease of 7.6%. Its import volume and imports both declined greatly, but the export volume increased and the exports declined slightly, indicating that the international market prices continue to decline.

In terms of the color display tube, in 2005, the import volume of the color display tube was 15.30 million, a 38.2 percent decrease; the imports amounted to 600 million US dollars, a decrease of 48.3 percent. The export volume was 5.98 million, a decrease of 14.2%; the exports amounted to 250 million US dollars, a decrease of 24.2%. Its import and export volume and imports and exports declined dramatically, indicating that the market of color display tube began to go downward.

In terms of the black and white picture tube, in 2005, the import volume of the black and white picture tube was 2.64 million, a 32.3 percent decrease; the imports amounted to 10.79 million US dollars, a decrease of 62.7 percent. The export volume was 4.05 million, a decrease of 5.8 percent; the exports amounted to 25.16 million US dollars, an increase of 51.4%. Its import volume and imports both declined dramatically, indicating that the market of black and white display tube will continue to shrink. The reason why the export volume declined slightly and the exports increased greatly is that Chinese government restricted the use of the regenerated glass bulb, which caused the rise of cost. Some enterprises had to stop production or reduce production for the high cost, thus the export prices rose.

In terms of the black and white display tube, in 2005, the import volume of the black and white display tube was 3.03 million, an increase of 278.8%; the imports amounted to 4.63 million US dollars, a decrease of 32.5 percent. The export volume was 530,000, a decrease of 24.3 percent; the exports amounted to 5.12 million US dollars, a decrease of 33.9%. Its export volume and exports both declined dramatically, indicating that the supply exceeds the demand in the international market of black and white display tube and the price goes down significantly.

In terms of the vacuum tube, in 2005, the import volume of the vacuum tube was 52.91 million, a decrease of 19.6%; the imports amounted to 118.49 million US dollars, a decrease of 37.6 percent. The export volume was 71.43 million, an increase of 17.9 percent; the exports amounted to 100.54 million US dollars, an increase of 17.7%. China’s vacuum tube has strong competitiveness in the international market, showing the development trend of decreasing in import year by year and the growth in export year by year. However, the bulb tube and ultra-high-power radio tube (higher

than 300 kW) and high voltage vacuum switch tube above 72.5kV, which are used on the CT machine, are still a blank spot in China, and are totally dependent on imports.

In terms of parts of picture tubes, in 2005, the imports of the parts of picture tubes were 268.56 million, a decrease of 35.2%; the exports amounted to 324.41 million US dollars, a decrease of 3.2 percent. The dramatic decrease of imports and slight decrease of imports showed that China's supporting ability in the parts of picture tubes has increased gradually. The import volume of other parts of Cathode Ray Tube (CRT) was 150 million US dollars, a decrease of 46.6 percent; the export volume was 61.25 million US dollars, the same with that of 2004. The imports of the parts of vacuum tubes amounted to 51.67 million US dollars, an increase of 12.5%; the exports amounted to 5.17 million US dollars, a decrease of 20.5 percent.

In terms of special light source, China's production of special light source mainly includes halogen tungsten lamp, fluorescent lamps, metal halide lamps and gas discharge lamp of four types of products. In 2005, the import volume of special light source was 834.12 million, an increase of 131.7 percent; the imports amounted to 839.68 million US dollars, an increase of 86.1 percent. The export volume was 3742.18 million, an increase of 8.2%; the exports amounted to 1688.74 million US dollars, an increase of 32.2%. The trade surplus achieved 850 million US dollars in 2005, an increase of 2.6 percent, indicating that export and import trade of China's special light source has maintained steady development and keeps the slight rise of the trade surplus for successive years.

5. Main enterprises

For the top 100 electronics enterprises, 5 enterprises of China's vacuum electronics industry were listed in the 20th China's Top 100 China Electronics & Information Enterprises, namely Boe Technology Group Co., Ltd, Dalian Daxian Group Co., Ltd, Huadong Electronics Group Company, Irico Group Electronics Company Limited and Henan Anyang CPT Glass Bulb Group Co., Ltd. BOE Technology Group Co., Ltd. ranked No. 3 in China's top 100 electronics and information enterprises and its revenues reached 54.8 billion yuan. The remaining four enterprises have always among the top 100 electronics and information enterprises over the past 20 years. The total

business income of the above five enterprises reached 78.17 billion yuan, accounting for 8.1% of the total revenue of the 20th session top 100 electronics and information enterprises.

In recent years, with the development of the grouplization in enterprises, the industry boundaries have been broken. Many vacuum tube plants did not maintain the single production mode of vacuum electronic products, and began to get involved in video, communications, and other new technology areas; some larger vacuum electronic enterprises were incorporate into holdings groups through reform. For example: SVA Electronic Co., Ltd., Shanghai Yongxin Color Picture Tube Co., Ltd. and Shanghai Electronic Glass Co., Ltd. were incorporated into SVA (Group) Co., Ltd.; Nanjing Huafei Color Display System Co., Ltd. and Nanjing Electronic Shadow Mask Co., Ltd. were incorporated into Huadong Electronics Group Company; Beijing Matsushita Color Picture Tube Co., Ltd. were incorporated into Boe Technology Group Co., Ltd.; and Shenzhen Seg-hitachi Colour Display Devices Co., Ltd. were incorporated into Shenzhen Electronics Group Co., Ltd., etc.

For enterprises engaging in the production of color picture tube and its parts and components, there enterprises adjusted industrial and products structure timely to respond to market changes in the face of the rapid development of flat panel display technology and fierce competition inside the industry. The CPT production and sales volume basically maintained the previous year's level. However, the state-owned enterprises or joint ventures with fewer varieties of products showed losses. Although some joint ventures did not show a deficit relying on their technology development strength and channel advantages in the international market, the profits showed different degrees of decline.

Irico Group is China's oversized electronics industry enterprise. The group has carried out six large-scale expansion transformations since completion of production in 1982. At present, the company has nine CPT production lines, and its main products range from 37cm to 92cm horizontal CPT of more than 10 varieties, with the annual production capacity of 14 million pieces, taking first place in China’s industry rank and fourth in the world. In addition, the company also produces glass envelope, aperture mask, electron gun, fluorescent powder, deflector coil, low melting point glass powder, convergence magnet and other components, is China's CPT

production base and export base with the strongest self-distribution capacity. In 2005, the total industrial output value of the company was 8.15 billion yuan, the sales income was 5.1 billion yuan, the paid taxes was 12.43 million yuan, and the total profit loss was 870 million yuan.

The yearly sales of color picture tubes of Shanghai Yongxin Color Picture Tube Co., Ltd. reached 5.16 million pieces, the total industrial output value achieved 2.32 billion yuan, and the sales income achieved 2.24 billion Yuan. It showed a deficit of 470 million yuan due to price rise of raw materials, increase in the cost of management and fall in market price.

The yearly sales of CPT of Nanjing Huafei Color Display System Co., Ltd. reached 6.71 million pieces, the CDT reached 2.11 million pieces, the sales income achieved 3.64 billion yuan, the profit and tax achieved 290 million yuan, and exports amounted to 150 million US dollars.

The yearly sales of CPT of Tianjin Samsung. SDI Co., Ltd. reached 3.10 million pieces, the CDT reached 3.25 million pieces, the sales income achieved 3.05 billion yuan, the profit and tax achieved 190 million yuan, and exports amounted to 100 million US dollars.

The yearly sales of CPT of Beijing Matsushita Color Picture Tube Co., Ltd. were 8.55 million pieces, and the projective tube reached 3.25 million pieces, the sales income achieved 3.44 billion yuan, the profit and tax achieved 110 million yuan, and exports amounted to 150 million US dollars.

In 2005, all enterprises engaging in the production of CPT bulb showed different degree of losses affected by CPT market changes. Henan Anyang CPT Glass Bulb Group Co., Ltd. is China's leading enterprise owning the biggest production capacity of CPT bulb, with the annual production of CPT of 27.29 million units, a 19.2 percent decrease; sales of 25.69 million units, a decrease of 19.5%; the sales income achieved 4.08 billion yuan, a 47.4 percent decrease.

In 2005, the enterprises engaging in the production of CPT shadow mask did not show the industry-wide losses affected by the market changes in the color picture tube, but the corporate profits declined substantially. Yantai Zhenghai Electronic Mask Co., Ltd. is the largest enterprise producing CPT shadow mask. The annual production of shadow mask was 31 million pieces, an increase of 10.6%; the sales volume was 28.55 million, an increase of 4.7 percent; the sales income achieved 1.21 billion yuan, up 17.5 percent; the profit and tax achieved 55.51 million yuan,

a 64.0 percent decrease. The sales of Nanjing Electronic Shadow Mask Co., Ltd. was 24.01 million pieces, a 8.6% decrease; the sales income achieved 470 million yuan, a 51.0 percent decrease; he profit and tax achieved 82.6 million Yuan, a 34.4 percent decrease. Clearly, the production and sales volume of CPT shadow mask had little change compared with the previous year, but the price rise in raw materials led to the increase in manufacturing cost, and the price fall of shadow mask led to the significant deduction of the profits of enterprises.

In terms of passive vacuum device, in recent years, China's passive vacuum device has maintained a sustained and stable development trend. Shaanxi Baoguang Vacuum Electric Device Co., Ltd. is the largest enterprise in the passive vacuum device industry. It produced 202,000 pieces of high-pressure vacuum switch tubes in 2005, an increase of 6.3%; the sales volume was 195,000 pieces, an increase of 8.3%; total industrial output value achieved 5.8 billion, a 3.3 percent decrease; sales income achieved 460 million yuan, up 35.3 percent; the profit and tax achieved 27.57 million yuan, a 46.9 percent decrease; the exports realized 3.96 million US dollars, an increase of 424.5 percent. Its main features are: substantial growth in sales income but significant decline in profit.

Jinzhou Huaguang Electric Power & Electron (group) Company is China's first enterprise introducing foreign technology and equipment. Its annual production of vacuum switch tubes was 114,900 pieces, a decrease of 4.3%; the sales volume was 108,700, a 4.7% decrease; the total industrial output value was 270 million yuan, a 10 percent reduction; the sales revenue achieved 1.9 billion yuan, up 18.8 percent; the profits realized 19.03 million yuan, an increase of 44.2 percent. Its main features are: Although the production and sales volume and industrial output value showed slight decline, the sales income as well as profit and tax both increased significantly.

The annual production of vacuum switch tubes of China Zhenhua (Group) Science & Technology Co., Ltd. Yuguang Branch was 145,000 pieces, a decrease of 13.2%; the sales income achieved 140 million yuan, a 17.7% decrease; the profit and tax realized 15.62 million yuan, a decrease of 45.0 percent. Its main features are: several business indexes showed different degrees of decline.

The above-mentioned three enterprises not only have large-scale production capacity, but also have strong technological development capability enjoying certain reputation in the vacuum

switch tube industry both at home and abroad. At present, Japan's Toshiba Corp. has signed an agreement with Jinzhou Huaguang Electric Power & Electron (group) Company to jointly operate ceramic vacuum switch tube products; Schneider Electric planed to establish a joint venture with Shaanxi Baoguang Vacuum Electric Device Co., Ltd. after several rounds of negotiations. In addition, several large foreign companies were planning to establish joint ventures with China Zhenhua (Group) Science & Technology Co., Ltd. Yuguang Branch. Some foreign large companies will enter Chinese market through holding shares of China's leading enterprises, and some domestic enterprises will enter the international market relying on foreign capital.

In terms of the vacuum optoelectronic device enterprises, SVA Electronic Co., Ltd. jointly established China's first production line of plasma display with Japan's Matsushita. The production line produced plasma display panel (PDP) of 110,000 pieces a year, an increase of 53.2%; the sales volume was 107,000 pieces, an increase of 53.1%. It jointly produced 28.97 million pieces of vacuum fluorescent display (VFD) with South Korea's Samsung Group, an increase of 2.4%; the sales volume was 29.62 million pieces, an increase of 5.8%. At present, the company has become China's enterprise production of the widest variety of flat-panel display.

Boe Technology Group Co., Ltd was mainly engaged in the production of CPT, transmitting tube, vacuum switch tube, and vacuum electronic devices. In recent years, the company developed for production of flat panel display through the restructuring, reorganizing, consolidating resources and adjustment of product structure. The annual production of vacuum fluorescent display (VFD) of Zhejiang Jingdongfang Vacuum Display Technology Co., Ltd. was 19.90 million pieces, the sales volume was 19.30 million pieces, and production and marketing rate reached 97.0%; the production of LED was display 10.40 million pieces, the sales volume was 10.2 million pieces, and production and marketing rate reached 98.1 %; the sales income reached 270 million yuan, the profit and tax achieved 12.30 million yuan, and the exports reached 18 million US dollars.

Huadong Electronics Group Company is China's largest and earliest vacuum optoelectronic device production enterprise, and its business expanded to the fields of color picture tubes and electronic mesh, kinescope getter, LCD display and other fields through the integration of resources. The annual sales income reached 5.12 billion yuan, the total profit was 130 million Yuan; it ranked No.

37 in the 20th China's Top 100 China Electronics & Information Enterprises.

On the vacuum electron devices enterprises, China Electronics Technology Group Corporation No.8 Research Institute, Guoguang Electric Co. Ltd. Chengdu and Nanjign Sanle Optoelectronics Co., Ltd. are the state's key units developing and producing electronic microwave tube supported by the state. In 2005, 24 projects of electronic microwave tube passed the provincial and ministerial technical appraisal, which not only met the needs of the state's key projects, but also obtained economic benefit. The annual production of magnetron of Shanghai Matsushita Electronic Instruments was 7.56 million pieces and the sales volume was 7.89 million pieces. Guangdong Galanz and Media built the production line of magnetron with the production capacity of 5 million pieces, and their products will support their microwave respectively.

Statistical data

Table 1. 2005 industry scale of vacuum electronic industry and composition

Enterprise type	Number of enterprises	Total staff	Including: composition		
			Technical staff	Management	Worker
Color picture tube and supporting enterprises	21	70035	8272	4855	56908
Black and white display tube and supporting enterprises	10	1554	151	49	1354
Passive vacuum device and supporting enterprises	23	15094	2475	1793	10826
Vacuum optoelectronic device and supporting enterprises enterprises	15	29693	4446	2765	22482
Vacuum electron device	14	7163	1920	765	4478

and supporting enterprises					
Total	83	123539	17264	10227	96048

Table 2. 2004-2005 the production and sales of major products of vacuum electron device industry

Unit：10,000/ 10,000

Product name	2004		2005			
	Output	Sales volume	Output	Growth rate（%）	Sales volume	Growth rate（%
Vacuum tube	1840	1767	1882	2.28	1908	7.98
Reception discharge lamp	68	86	106	55.88	101	17.44
Transmitting tube	10	9	20	100.00	18	100.00
UHF tube	1762	1672	1756	-0.34	1789	7.00
Braun tube	11318	11064	9356	-17.34	9388	-15.15
Black and white display tube	1486	1477	739	-50.27	763	-48.34
Color picture tube	6624	6491	6545	-1.19	6559	1.05
Color display tube	3208	3096	2072	-35.41	2066	-33.27
Ionic tube	6216	6055	10059	61.82	9639	59.19
X-ray tube	2.1	2.1	4	90.48	4	90.48
Vacuum switch tube	150	148	189	26.00	175	18.24
vacuum fluorescent display tube	6484	6322	5672	-12.52	5607	-11.31
Kinescope fittings	20265	19670	19638	-3.09	19020	3.20
Black and white glass	1600	1490	2448	53.00	2901	94.70

bulb						
Color glass bulb	9408	9220	8468	-9.99	8082	-12.34
Color aperture mask	9257	8960	8722	-5.78	8073	-10.30
Electric light source	17641	16130	15793	-10.48	14952	-7.30
High voltage sodium lamp	593	536	227	-61.72	209	-61.01
Automotive light	686	593	775	12.97	818	37.94
Energy-saving lamp	6619	6262	6164	-6.87	5897	-5.83
Fluorescent lamp	9743	8739	8627	-11.45	8082	-7.52

Table 3. Enforcement condition of major economic indicators of vacuum electron device industry in 2005

Project name	Unit	2003	2004	Growth rate（%）	2005	Growth rate（%）
Output value （current price）	10,000 yuan	6547600	8463576	29.3	6426571	-24.1
Sales income	10,000 yuan	6580464	7846252	19.2	6381183	-18.7
Profit and tax	10,000 yuan	574473	684510	19.2	97256	-85.8

Table 4. Enforcement condition of scientific research results of vacuum electron device industry in 2005

Product name	Color picture tube	Flat panel display	Vacuum switch tube	Microwave Tube	Vacuum tube	Electric light source	Others	Total
Quantity	3	3	5	24	5	2	8	50

Table 5. Product import and export trade of vacuum electron device industry in 2004-2005

Unit：10,000 US dollar

Product name	2004		2005			
	Import volume	Export volume	Import volume	Growth rate (%)	Export volume	Growth rate (%)
Color display tube	102818	86235	64733	-37.0	79665	-7.6
Color display	116365	32940	60823	-47.7	24574	-25.4
Black and white display tube	2892	1662	1079	-62.7	2516	51.4
Black and white display	686	774	463	-32.5	512	-33.9
Other CRT	1548	58	917	-40.8	47	-19.0
Vacuum tube	18976	8540	11849	-37.6	10054	17.7
Parts of kinescope	41446	33513	26856	-35.2	32441	-3.2
Other parts of transmitting tube	28223	6128	15077	-46.6	6125	0.1
Parts of vacuum	4591	650	5167	12.5	517	-20.5

tube						
Electric light source	45124	127745	83968	86.1	168874	32.2
Total	362669	298245	270932	-25.3	325325	9.1

Table 6. Products import and export volume of vacuum electron device industry in 2004-2005

Unit: 10,000

Product name	2004		2005			
	Export volume	Import volume	Export volume	Growth rate (%)	Import volume	Growth rate (%)
Color kinescope	2399	1814	1838	-23.4	1952	7.6
Color display tube	2476	697	1530	-38.2	598	-14.2
Black and white kinescope	390	430	264	-32.3	405	-5.8
Black and white display tube	80	70	303	3.8 倍	53	-24.3
Other CRT	630	51	260	-58.7	243	4.8 倍
Vacuum tube	6578	6056	5291	-19.6	7143	17.9
Parts of kinescope	2356	4428	1300	-44.8	4444	0.4
Other parts of transmitting tube	1070	843	503	-53.0	615	-27.0
Parts of vacuum tube	212	26	164	-22.6	15	-42.3
Electric light source	35993	346006	83412	2.3 times	374218	8.2
Total	52184	360421	94865	81.8	389686	8.1

X. Electronic component industry

1.Overview

The enterprise's scope in main economic indicators statistics for China's electronic component industry made a greater breakthrough in 2005. In 2005, there were totally 31,523 enterprises had been taken into the consideration of main economic indicators statistics scope for electronic component industry under Ministry of Information Industry of China. This figure accounted for 56.64% of the total number of enterprises of electronics manufacturing industry. The number of enterprises above designated size (annual production value exceeded 5 million *yuan*) in the statistics were 8,987 (statistical magnitude of state-owned enterprises and those above designated size were 6,852 in 2004), accounting for 56.14% of the total number of enterprises above designated size in electronics manufacturing industry. Average number of annual employed person for whole year were 2,887,341, taking up 43.05% of average number of employed person in electronics manufacturing industry. The total assets of whole enterprises hit 8 61.495 billion *yuan*. Average balance of net value of fixed assets of whole enterprises hit 231.393 billion *yuan*. Average balance of current assets of whole enterprises reached 333.487 billion *yuan*. Among the abovementioned figures, total assets of the enterprises above designated size hit 537.031 billion *yuan*; average balance of net value of fixed assets of the enterprises above designated size reached 154.428 billion *yuan*; average balance of current assets of the enterprises above designated size hit 124.240 *yuan*.

There were 9 special research institutes engaged in the study of electronic components in electronic component industry. Furthermore, there were also some special laboratories on the study of electronic component in some special research institutes on complete electronic machine. For example, Electroacoustic Device Laboratory of China Electronic Technology Group Corporation No 3 Research Institute, Quartz Crystal Device Laboratory of China Electronic Technology Group Corporation No 10 Research Institute, Printed Circuit Board Laboratory of China Electronic Technology Group Corporation No 15 Research Institute, Printed Circuit Board Laboratory of Jiangnan Institute of Computing Technology, Optical Fiber Laboratory of the 46th

Research Institute China Electronic Technology Corporation and Optical Fiber, Optical Cable and Passive Component Laboratory of Wuhan Research Institute of Post and Telecommunications.

Reform and the reorganization works

——Holding proprietary intellectual property rights. China's electronic component enterprises harvest lots of fruits by giving top priority to the self-innovation in 2005. For example, Hengdian Group Dongci Co.,Ltd. in Zhejian had seven patent applications for invention and other 24 patent applications. Yongding Group Co.,Ltd. had eight patent applications. Presently Yongding Group Co.,Ltd. has been granted 12 letters of patent and its nine patents application were acepted. Chengdu Xingweike Company's two patents application were accepted. Ningbo Forward Relay Corporation Ltd was awarded two letters of patent. Presently, Ningbo Forward Relay Corporation Ltd holds 30 kinds of products with letters of patent.

——Developing private brand products. China Zhenhua Electronics Group, Xiamen Hongfa Electroacoustic Co.,Ltd. and Zhejiang Hengdian Group Dongci Co.,Ltd. actively cultivated and developed private brand products and made remarkable progress by carrying out "Going Out" Strategy.

——Many enterprises were successful listed on the stock market. Guangzhou Guoguan electroacoustics Company and Jingyuan Electronics (JYEG) were listed on Shenzhen Stock Exchange and became the first listed company respectively in domestic electroacoustics industry and domestic quartz crystal component industry. Furthermore, Baoding Fengfan Company was listed on Shanghai Stock Exchange. Wuxi Shangde Suntech Power Co.,Ltd. was listed on stock market in the US by foreign capital infusion and its productivity leaped into the front ranks of the world.

——Remanufacturing and confederating practice. Shaanxi Qunli Radio Appliance Factory was successful remanufactured into Shaanxi Qunli Electric Co.,Ltd. by debt-to-equity swap. Yangtze Optical Fiber and Cable Co.,Ltd. (YOFC) engaged in optical fiber industry and Jiangsu Zhongtian Technology Co.,Ltd. engaged in optical cable industry accelerated their long-term strategic cooperation by means of equity participation.

Work on Electron & Information Industrial Park

There are eight industrial parks related to electronic component and electronic component materials industries among the first batch of national electron & information industrial parks approved by Ministry of information industry. They are China (Tianjin) Chemistry and Physics Power Industry Park, China (Xinxiang) Chemistry and Physics Power Industry Park, China (Guiyang) Chip Component & Device Industrial Park, China (Tianjin) Chip Component & Device Industrial Park, China (Jiangxing) Electromechanical Components Industrial Park, China (Fuyang) Optical Fiber and Cable Industrial Park, China (Tongling) Electronic Materials Industrial Park and China (Yichang) Electronic Materials Industrial Park.

Other works

Post-doctoral Workstation of Fenghua Group and Post-doctoral Workstation of Hengdian Group Dongci Co.,Ltd. were awarded the honor of "National Outstanding Post-doctoral Workstation" on Conference on National Outstanding post-doctorate commendation & Post-doctoral Working.

Jiangsu Shuangdeng Group Company has been qualified the assessment on environment-friendly enterprise by Ministry of Environmental Protection of the People's Republic of China and become the first enterprise in battery industry passed abovementioned assessment.

China Industrial Association of Power Sources and China Electronic Components Association respectively have successfully held the 4th and 5th members representative conference and completed the term-change election work.

2. Production and sales

China's electronic component industry has become a major force to boost the growth of electronic information industry at the growth rate higher than the average growth level of entire electronic information industry. The general growth is marked by increasingly expansive scale, rapidly growing economic returns, continuously rising production and exports and increasingly improved industrial concentration in 2005.

According to the statistics by Ministry of Information Industry, in 2005, China's electronic component industry realized the value of gross output (current value) to 8 94.189 billion *yuan*, accounting for 25.7% of the total output value of electronics manufacturing industry, the added

value of industry to 218.064 billion *yuan*, accounting for 29.06% of that of electronics manufacturing industry, sales value of industry to 846.493 billion *yuan*, accounting for 25.3% of that of electronics manufacturing industry. The sales revenue, total profits and total tax complete by China's electronic component industry hit 852.92 billion, 47.807 billion and 11.125 billion *yuan* respectively. It is necessary to explain that the comparison made between the enterprises above designated size and state-owned enterprise and enterprise above designated size in 2005 due to the lack of all-society statistics. Compared with the figures in 2004, the industrial production, industrial added value, sales revenue, total tax profits and total profits of China's electronic component industry increased 40.5%, 47.7%, 45.6%, 12.2% and 33.8% respectively in 2005 thanks to the 31% growth of the number of enterprises and the real development of the enterprises. According to statistic data, we can learn that the China's electric wire and cable manufacturing industry depended on the enterprises below designated size to realized the main economic indicators, while other manufacturing industries mainly depended on the enterprises above designated size, which offer most of the production value, production value of new products, export delivery value, industrial added value, sales revenue, total profits and tax. By comparing with the diverse scales of enterprises in electronic component industry, main indices of economic returns and contribution ratio of total assets, the figures of abovementioned indicators realized by the enterprises below designated size were well below those realized by the enterprises above designated size in other manufacturing industries, except the figures of figures of abovementioned indicators realized by the enterprises below designated size is higher than those realized by the enterprises above designated size in micro-machine and electric wire & cable manufacturing industries.

The amount of loss for electronic component enterprises is 84.1 billion *yuan* generated by the unprofitable firms, of which the enterprises above designated size are 1,722 and the enterprises below designated size are 5,872. The amount of loss of the 1,722 enterprises above designated size and 5,872 enterprises below designated size is 4.062 billion and 80.121 billion *yuan* respectively, accounting for 19.1% and 25.9% respectively of the total loss of electronic component industry.

According to Ministry of Information Industry's statistics on sales and output of the electronic

component products for 804 enterprises, in 2005, the sales of electronic component products hit 684.555 billion pieces, increasing 39.3%; the output of electronic component products hit 707.966 billion pieces, increasing 40.0%. Among them, the chip electronic components are 513.719 billion pieces and chip rate hit 72.7%. The output and sales of the products of electronic component industry are shown respectively in Table 3 and Table 5. Make a comparison between economic operation indicators and number of enterprises in sales and output tables. The sales and output of electronic component industry shown in Table 3 and Table 5 is only the statistics for 804 enterprises. In fact, the all-society statistics of the economic indicators for the enterprises is over 30,000 enterprises, of which the enterprises above designated size are 9,000. Due to the means of classification on economic and financial statistics, the enterprise was classified in manufacturing industry accordingly by its main products at first. Furthermore, some enterprises were classified by original standard on basis of history record. Therefore, all the financial data were charged to the manufacturing industry. The statistics on product output was the total volume of the products of same kind made by the abovementioned enterprises and other enterprises of other manufacturing industries. So it is unlikely to easily compare the economic operation data and product output on an annual basis.

According to the statistics by Electroacoustic Sub-association of China Electronic Components Association, the sales revenue of China's electroacoustic industry in 2005 hit 40.7 billion *yuan*, an increase of 25.62% on a year-on-year basis. Output of electroacoustic component products hit 6.04 billion pieces, increasing 17.7%.

3. Scientific research and new product

The production value of the new products realized by electronic component industry in 2005 hit 65.90513 billion *yuan*, accounting for 7.37% of the total industrial output value (current price) all the year round and less than 18.16% of the production value of the new products (current price) realized by electronics manufacturing industry.

According to incomplete statistics, the number of certified new product of electronic component and new technologies completed in 2005 is totally 180, of which 49 of them reached the

international advanced level. The detailed information is as follows: 43 products such as acoustic surface wave (ASW) components, inertial components, Ceramic components and acousto-optic device were from China Electronic Technology Group Corporation No 26 Research Institute, the 440W Yb-doped double clad optical fiber of Fenghuo Communication Group Co.,Ltd., the mass production processing technology of multi-layer comunication backplane developed by Shenzhan Shennan Circuits Co.,Ltd., four products such diverse series of electrical connector and composite material connector developed by China Aviation Optical-Electrical Technology Co.,Ltd., 65 products such as high tensile-strength twin cable floating cable and pole connector as well as optical and electric cable developed by China Electronic Technology Group Corporation No 33 Research Institute, 16×16 non-blocking matrix switch based on MOEMS jointly developed by Shanghai Institute of Optics and Fine Mechanics and Research Institute of Micro/Nano Science and Technology of Shanghai Jiao Tong University, two products including high performance electromagnet filter NiZn core developed by Tiantong Holding Co.,Ltd., three products including environment-friendly physically foamed polythene insulated flexible coaxial cable developed by Jiangxi Lianchuang Optoelectronic Science And Technology Co.,Ltd. Cable Branch, ten products including dry-pressed anisotropic magnetic ferrite DM3930D developed by Zhejiang Hengdian Group Dongci Co.,Ltd., three products including optical fibre sensor developed by China Electronic Technology Group Corporation No 8 Research Institute, nine KNF-004 products developed by China Electronic Technology Group Corporation No 40 Research Institute, three products including electrical relay developed by Shaanxi Qunli Electric Co.,Ltd., 24 products including thick film circuit, connector and regulation resistance developed by Xijing Electronic Corporation, two projects including ferroboron N48H sintered magnet developed by Zhejiang Hengdian Group Dongci Co.,Ltd. and ten products including DC solid state relay developed by Beijing Keystone Electronic Relay Corp.

4. Major engineering and key project

China Zhongchi Nano Technology Co.,Ltd. is the first manufacturer engaged in nano ferrous power. In 2005, Zhongchi Nano Technology’s 1,200-ton nano ferrous power auto production line

was put into operation in Yangquan in Shanxi.

Tianjin Lishen Battery Joint-Stock Co.,Ltd. completed its phase IV expansion. Presently, this company's productivity in lithium battery hits 200 million pieces per year.

5. International cooperation and foreign trade

Works on foreign capital introduction, joint venture and cooperation

In 2005, electronic component enterprise utilized foreign capital to 22.32851 billion yuan, accounting for 41.53% of total amount of foreign capital utilized by electronics manufacturing industry. The foreign direct investment hit 19.74770 billion yuan, accounting for 43.31% of total amount of foreign direct investment in electronics manufacturing industry and 35.47% of total investment in fixed assets this year of electronic component industry. There were 562 construction projects in fixed asset investment by three kinds of foreign-invested enterprises (Sino-foreign joint ventures, cooperative businesses and exclusively foreign-owned enterprises in China) of electronic component industry. Among the abovementioned projects, 380 projects were started and 342 projects were put into operation in 2005. Therefore, the foreign investment in China's electronic components has exceeded that in computer, special equipment, communication and home audiovisual.

The campaign on foreign investment and factory establishment for foreign enterprise (including Hong Kong Special Administrative Region and Taiwan Region) engaged in PCB and PCB materials production has reached a new boiling point. Dalian Pacific Electronics Co.,Ltd. was a joint venture, co-founded by Dalian Daxian Enterprises Holdings Co.,Ltd., Dalian Pacific Multi-Layer PCB Co.,Ltd., Japan Circuit Technology Co.,Ltd. and Singapore SME Investment Co.,Ltd., engaged in development, design and production of HDI multi-layer PCB and 2-M-2, 3-M-3BUILD Upsubstrate. In 2005, this company was officially put into operation. AT&S (China) Shanghai Plant began to build its second plant in Chinese mainland. Jianding Electronics Co.,Ltd. is the largest breadboard manufacturer on TFT-LCD and memory-chip panels in Taiwan region. This company has established No 1 and No 2 Jianding Electronics Wuxi Plants respectively. After these two plants were put into operation, the company prepares to establish No 3 plant in Chinese

mainland. Hong Kong Topsearch Co.,Ltd. has finished its phase II project of a new plant in Shaoguan of Guangdong Province and quickened the construction of its plant project in Tongliao City of Inner Mongolia. Japan Mingxin Company expanded its plant in Wuhan and expected to increase 140% of productivity. Then, this plant would become the largest manufacturer on automobile PCB in Chinese mainland.

Shenzhen Deren Electronic Co.,Ltd. signed an agreement with US-based Tyco International Ltd to cooperate in electronic connector production and market. Anhui-based Tong Feng Electronics signed an agreement with Germany-based EPCOS (joint-venture funded by Siemens and PANASONIC) to establish a joint venture engaged in manufacturing power capacitor and power-factor correction capacitor in Tongleng.

Import and export

In 2005, the import volume of electronic component products hit US$ 28.448 billion, an increase of 18.3% on a year-on-year basis. The growth rate fell back to 8% for the first time for years. The export volume hit US$ 19.391 billion, increasing 22.9%, an increase of 3% on a year-on-year basis. The export and import trade of electronic component products had been in red for seven years. The value of passive balance would continue to increase to US$ 9.057 billion, an US$ 800 million growth on a year-on-year basis. Same with that of 2004, there were still passive balance in export and import trade of seven products including magnetic materials, electrical relay, electroacoustic device, micro-machine, magnetic head, optical cable and cadmium-nickel storage battery, of which electroacoustic device is the largest deficit product and its passive balance hit US$ 2.44 billion, a US$ 0.46 billion growth on a year-on-year basis. On the contrary, hybrid circuit and capacitor generated the largest passive balance, US$ 5.87 billion for hybrid circuit and US$ 2.88 billion for capacitor. Furthermore, the passive balance for PCB hit US$ 1.23 billion, for connector hit US$ 0.78 billion, for resistor hit US$ 0.73 billion and for quartz crystal device hit US$ 0.68 billion. Among 17 products shown in Table 9, the growth rate of import began to lower than that of export for seven products. Although the growth rate of export is higher than that of import for some products, but trade deficit still remains. For example, the exports of PCB increased 39.7%, while the import of that increased 29.5%. In recent years, the import and exports

of optical cable shows trade deficit with export growth rate higher than that of import. Compared with that of 2004, the import structure for electronic component products has not changed; the imports for four major products such as hybrid circuit, PCB, electric connector and capacitor exceed 60% of that of electronic component products.

The export volume of electronic component products is divided by economic classification of the export enterprise: the total exports of three kinds of foreign-invested enterprises accounts for 75.49% of that of electronic component products. Among this figure, exclusively foreign-owned enterprises accounted for 52.65%, increasing 33.9%; Sino-foreign joint ventures accounted for 19.4%, increasing 10.5%; state-owned enterprise accounted for 13.69%, decreasing 5%. On basis of classification by trade mode, exports of processing products with imported and supplied materials accounted for 77.81% of that of electronic component products; exports for products classified by general mode accounted for 18.1%. Domestic major export region in electronic component products was Hong Kong Special Administrative Region, accounting for 43.2% of total exports of electronic component products. The US accounted for 9.55% of total exports of electronic component products. Japan and South Korea accounted for 9.34% and 6.64% of total exports of electronic component products respectively.

According to the statistics by China Electronic Components Association, in 2005, the top 10 exporter of electronic component products were as follows: Xiamen TDK Co.,Ltd. with exports of US$ 333.97 million, Tianjin Zenmay Electro-acoustic Equipment Company with exports of US$ 239.03 million, Shanghai Feilo Co.,Ltd. with exports of US$ 227.15 million, NEC Dong Jin Technology (Xiamen) Co.,Ltd. with exports of US$ 219.86 million, Shanghai KYOCERA Electronics Co.,Ltd. with exports of US$ 193.05 million, EPCOS (China) Investment Ltd with exports of US$ 173.20 million, Kaiping Elec Eltel Electronics Co.,Ltd. with exports of US$ 154.06 million, Hengdian Group Dongci Co.,Ltd. with exports of US$ 152.80 million, Guangdong Shengyi Sci. Tech Co.,Ltd. with exports of US$ 140.73 million and Guangzhou Hongren Electronic Industry Co with exports of US$ 102.52 million.

On basis of the classification by the economic mode of exported enterprise, the exports of electronic component products mainly concentrated in exclusively foreign-owned enterprises. The

imports of exclusively foreign-owned enterprises accounted for 63.1% of total exports of electronic component products, an increase of 23.0% on a year-on-year basis. The imports of Sino-foreign joint ventures accounted for 19.0% of total exports of electronic component products, an increase of 13.9% on a year-on-year basis. The imports of state-owned enterprises accounted for 9.7% of total exports of electronic component products. On basis of classification by trade mode, exports of processing products with imported and supplied materials accounted for 76.6% of that of electronic component products; exports for products classified by general mode accounted for 11.3%. On basis of the imports of imported product, three-fourths products were the electronic component products needed processing into finished product at home other than the real imported electronic component products. There were 89 countries and regions, of which Japan accounting for 22.8%, Taiwan region accounting for 17.5% and South Korea accounting for 10.1%, providing China with electronic component products. In accordance with statistics, the electronic component products from home market (free trade area) accounted for 28.3% of total imports of electronic component products.

Therefore, China's import and export trade of electronic components were mainly conducted by three kinds of foreign-invested enterprises by means of imported and supplied materials and formed a special industrial chain of supply and demand for domestic sales of commodities originally produced for exports.

In accordance with the statistics by Ministry of Information Industry, in 2005, the export delivery value of electronic component manufacturing enterprise was 332.41295 billion *yuan*, accounting for 17.96% of that of electronics manufacturing industry and 39.3% of total production value of electronic component industry, of which the export delivery value of the enterprise above designated size hit 266.23546 billion yuan, an increase of 23.5% and accounting for 51.5% of sales of industries of the same kind. The exported number of general electronic components hit 440.56 billion pieces, accounting for 64.3% of total sales on a year-on-year basis. The exports of PCB hit 53.6% of its total sales. The exports of radio-frequency cable accounted for 47.5% of its otal sales. The export delivery value of electronics manufacturing industry accounted for 51.79% of sales of the industries of the same kind. The export delivery value of electro-mechanic products

accounted for 22.45% of its sales.

6. Main enterprises

Top 100 electronic information enterprises

In 20th ranking of top 100 electronic information enterprises, 42 enterprises were electronic component manufacturing enterprises, of which 27 enterprises mainly engaged in electronic component manufacture and 15 enterprises engaged in optical wire and cable production. Hengtong Group Co.,Ltd. was the top one of the 42 enterprises, taking the 33rd slot; then Yongding Group Co.,Ltd. took the 39th slot; Jiangsu Zhongtian Technology Co.,Ltd. took the 49th slot and its operating profit hit the 6th slot; Jiangsu Hongtu High Technology Co.,Ltd. took the 50th slot; Zhejiang Fuchunjiang Communication Group Co.,Ltd. took the 51st slot; Tongguang Group Co.,Ltd. took the 52nd slot; Wuhan Research Institute of Post and Telecommunication took 60th slot and its total number of enterprise patent application took the 10th slot; YOFC took the 66th slot; Hualun Group took the 75th slot; Tongling Jingda Copper Material Group Co.,Ltd. took the 76th slot; Chongqing New Taishan Electric Wire & Cable Co took the 96th slot; Hong'an Group Co.,Ltd. took the 98th slot and its operating profit took the 9th slot.

The following four enterprises engaged in comprehensive electronic component production. Shanghai Feilo Co.,Ltd. took the 28th slot and its total profit took the 5th slot; China Zhenhua Electronics Group Co.,Ltd. took the 64th slot; Shanghia Jinling Co.,Ltd. took the 67th slot; Jiangxi Electronics Group took the 85th slot and its R&D input took the 4th slot.

Four enterprises engaged in battery production were as follows: Qingdao Aucma Co.,Ltd. took the 30th slot; BYD Co.,Ltd. took the 31th slot and its total profit took the 8th slot and its operating profit took the 10th slot; Harbin Guangyu Group Company Ltd took the 87th slot; Jiangsu Shuangdeng Group tool the 74th slot and its operating profit took the 7th slot and its R&D input took 10th slot. Following four enterprises mainly engaged in magnetic materials and devices production. Hengdian Group Dongci Co.,Ltd. took the 53rd slot. Ningbo Yunsheng Co.,Ltd. took the 69th slot. Xianyang Pianzhuan Group Corporation took the 71st slot. Zhenghai Group Co.,Ltd. took the 91st slot. The enterprise mainy engaged in production of copper clad laminate was only

one as follow. Guangdong Shengyi Sci Tech Co.,Ltd. took the 89th slot and its operating profit took the 4th slot.

About Top 100 Electronic Component Enterprises

Total sales of the 19th ranking of top 100 electronic information enterprises hit 84.26 billion yuan, increasing 10.62 billion yuan, a 14.42% increase on a year-on-year basis. Total profit hit 6.614 billion yuan, an increase of 19.83%, accounting for 13.83% of the total profit of electronic component industry. Foreign exchange earnings hit US$ 4.057 billion, a 27.18% increase, accounting for 20.9% of total exports of electronic component industry. The Top 100 Electronic Component Enterprises in the 19th ranking changed a lot. 17 enterprises in the last Top 100 can't be listed in the 19th ranking. Compared with last ranking, there were 26 enterprises' sales exceeded one billion yuan and additional seven enterprises' sales exceeded this figure. 76 enterprises' sales increased over 10% on a year-on-year basis, while nine enterprises experienced negative growth. Sales of 13 enterprises, increased over 50% on a year-on-year basis, included Guizhou space appliance share Co.,Ltd. (a 114.2% increase in sales on a year-on-year basis), Xi'an Chuanglian Electronic Component (Group) Co.,Ltd., China Zhenhua (Group) Xinyuan Electronic Component Co.,Ltd., Shenyang Aero-Electric Appliance Co.,Ltd., Foshan Cheng'an Copper Co.,Ltd., Hangzhou Fusheng Electrical Appliance Co.,Ltd., Ruisheng Acoustics Technology Co.,Ltd. and Shenzhen EYang Technology Development Co.,Ltd..

In the 19th Top 100 Electronic Component Enterprises, the top one was Shanghai Feilo Co.,Ltd., which realized the sales of 5.36776 billion yuan; the second one was Hengtong Group Co.,Ltd., which realized the sales of 5.56394 billion yuan; the third one was Yongding Group Co.,Ltd., which realized the sales of 4.74624 billion yuan. Top 100 Electronic Component Enterprise of the 19th ranking were mainly located in the following 18 provinces and municipalities directly under the Central Government, including Zhejiang, Guangdong, Jiangsu, Fujian, Beijing-Tianjin-Tangshan regions and City of Shanghai. There were 20 enterprises in Zhejiang, 21 in Guangdong, 17 in Jiangsu, seven enterprises in Fujian, five in Beijing-Tianjin-Tangshan regions, three in Shanghai and 18 in other provinces and municipalities directly under the Central Government.

In the 19th Top 100 Electronic Component Enterprises, comprehensive enterprises hit 14% and the sales of such enterprises accounted for 22.33% of total sales of Top 100 Enterprises. There were 12 enterprises engaged in optical wire and cable production and the sales of such enterprises accounted for 31.64% of total sales of Top 100 Enterprises. There were 16 enterprises engaged in capacitor production and the sales of such enterprises accounted for 9.9% of total sales of Top 100 Enterprises. There were 10 enterprises engaged in printed circuit production and the sales of such enterprises accounted for 9.5% of total sales of Top 100 Enterprises. There were six enterprises engaged in magnetic materials production and sales of such enterprises accounted for 5.7% of total sales of Top 100 Enterprises.

The Top 100 Electronic Component Enterprises hit a 19.83% increase in total profit on a year-on-year basis. There were 12 enterprises, which total profit exceeded 100% on a year-on-year basis, and 44 enterprises, which total profit exceeded 30% on a year-on-year basis, in Top 100 Electronic Component Enterprises. In 2005, among the electronic component enterprises with sales over one billion yuan, the max return on gross assets of Guangdong Fenghua Hi-tech Holding Co.,Ltd., Futong Group Co.,Ltd., Guangzhou Hongren Electronic Industry Co.,Ltd. and NEC Dong Jin Technology Co.,Ltd. only hit 4.05%, which was far behind the average level, 9.78%, of the 19th ranking for electronic component enterprises due to the negative growth of total profit. So the ranking of abovementioned enterprises fell over last year.

In the 19th Top 100 Electronic Component Enterprises, there were 56 enterprises with exports over US$ 10 million and 21 enterprises with exports over US$ 50 million.

About Top 100 Printed Circuit Enterprises

The 5th Top 100 Printed Circuit Enterprises realized the sales of 19.77538 billion yuan. The min standard of sales revenue for the 5th Top 100 Printed Circuit Enterprises was 36 million yuan. There were 75 enterprises, which sales revenue exceeded 100 million yuan and 15 enterprises, which sales revenue exceeded one billion yuan. Among the 5th Top 100 Printed Circuit Enterprises, the top one was Guangzhou Tianli PCB Co.,Ltd. with sales revenue of 2.7 billion yuan; the second one was Lianneng Technology (Shenzhen) Co.,Ltd. with sales revenue of 2.569 billion yuan and the third one was SCSC with sales revenue of 1.816 billion yuan.

7. Market prospect

China has become a large manufacturer in electronic component and its output of multi-products has been leaped into the front ranks of the world. China has become an important link in the supply chain of electronic component industry, while its general level of this industry has still been in the low level and still depended on the core and key technology. China's trade balance and industry security still need to intensify. Therefore, the top priority should be given to the support in electronic component industry and the promotion on technical breakthrough in key fields as well as the development of competitive enterprises.

Characteristics on the development of electronic component market

Firstly, with the increase of integration level and capacity of the IC with single-function complete appliance, the number of the electronic components needed by single machine tended to go down. For example, mobile phone was only composed of over 200 components, which were over 1000 component at first. Secondly, thanks to the application and promotion of the multi-function and multi-media technology of complete electronic appliances, the number of electronic component in need tended to increase. Thirdly, the adjustment on the structure of the complete electronic appliances made the market a few new growth points. For example, the change from common phone to wireless phone made the number of electronic components needed by phone increased from around 60 to around 400. Furthermore, the ratio of the output of wireless phone in the total output of phones rapidly increased.

Characteristics on the development of battery industry

China's battery industry as a whole has still been in the fast and stable growth period. Its development characteristics are as follows: firstly, the competition on large and medium valve regulated sealed lead acid storage battery has been in a rat race; pushed by the automobile industry, small valve regulated sealed lead acid storage battery has bright market prospect and sound market space. Secondly, lithium battery industry still maintained a rapid growth. The market growth manner changed from low capability and high output to large-scaled production paying attention to quality and efficiency. Thirdly, China's capacity in solar battery developed rapidly, but the

actual output is under the capability due to the restriction of raw materials. Fourthly, China's enterprises have increasingly attached profound importance to the R&D work for battery materials. China has improved the situation that the key materials of new batteries such as lithium battery and nickel-hydrogen battery depended on import. The rapid growth rate and the price increase of great disparity in lithium, lead, nickel and other nonferrous materials had impacted the battery industry a lot.

【Statistical data】

Table 1 Electronic component industry scale in 2005

Item name	Number of Research Institutes	Number of enterprises	Including: enterprise above designated size	Proportion accounting for total number of enterprises（%）	Average number of employed persons	Including: average number of employed persons of enterprise above designated size	Proportion accounting for average number of employed persons（%）
Electronic component industry	9	31 623	8 989	28.43	2887341	2222237	76.96
Electronic component manufacturing industry	1	3852	731	18.98	272455	189318	69.49
Electronic component and subassembly manufacturing industry	4	11189	2961	26.46	1472437	1196422	81.26

Printed circuit board manufacturing industry		1623	535	32.96	332560	290751	87.43
Micro-machine manufacturing industry	1	2889	982	33.99	324637	274430	84.53
Electric wire and cable manufacturing industry	2	8951	2824	31.55	195010	44690	22.92
Optical wire and cable manufacturing industry	（2）	325	124	38.15	32274	27072	83.88
Battery manufacturing industry	1	2795	832	29.77	257968	199554	77.36

Remark:

1. Two research institutes of electric wire and cable manufacturing industry and optical fiber and cable manufacturing industry also conducted the R&D work on products for these two industries;

2. Average number of employed persons is only that of the employees of the enterprises;

3. Source: Department of Economics Reform and Running of China Ministry of Information Industry (MII)

Table 2 Performance of main economic parameters of electronic component industry from 2003 to 2005

Item name	Unit	2003	2004	2005	Growth rate （%）

Total industrial output value of the electronics manufacturing industry as a whole（currant price）	10,000 yuan			347902857	
Including: enterprises above designated level	10,000 yuan	178344756	245016711	306503181	25.09
Including: industrial output of electronic component industry（currant price）	10,000 yuan			89418859	
Including: enterprises above designated level	10,000 yuan	32833177	46400568	65202356	40.52
Industrial added value of electronics manufacturing industry as a whole	10,000 yuan			75045327	
Including: enterprises above designated level	10,000 yuan	35454701	51929847	67005327	29.03
Including: added value of electronic component industry	10,000 yuan			21806387	
Including: enterprises above designated level	10,000 yuan	8026375	11514924	17013863	47.75
Sales revenue of electronics manufacturing industry as a whole	10,000 yuan			345109932	
Including: enterprises above designated level	10,000 yuan	175789524	241268786	310098014	28.53
Including: sales revenue of electronic component industry	10,000 yuan			85292545	

Including: enterprises above designated level	10,000 yuan	30995080	44242941	64422463	45.61
Total pre-tax profits of electronics manufacturing industry as a whole	10,000 yuan			15035556	
Including: enterprises above designated level	10,000 yuan	9535822	13108184	14531681	10.86
Including: total pre-tax profits of electronic component industry	10,000 yuan			5893330	
Including: enterprises above designated level	10,000 yuan	2345084	3240107	4228582	30.51
Total pre-tax profits of electronics manufacturing industry as a whole	10,000 yuan			11245194	
Including: enterprises above designated level	10,000 yuan	6958893	10041945	10741319	6.97
Including: total pre-tax profits of electronic component industry	10,000 yuan			4780768	
Including: enterprises above designated level	10,000 yuan	1712470	2398678	3209177	33.79

Remarks:

Data source: from Department of Economics Reform and Running of China Ministry of Information Industry (MII)

Table 3 Sales of the products of electronic component industry from 2003 to 2005

Name of	Unit	2003	2004	2005

products		Sales volume	Growth rate（%）	Number of enterprises	Sales volume	Growth rate（%）	Number of enterprises）	Sales volume	Growth rate（%）
Total volume of electronic components	10,000 pieces	37551540	13.8	774	49135723	30.8	804	68455520	39.3
Capacitor	10,000 pieces	18320589	17.8	86	27857009	52.0	104	32204530	15.6
Resistance and regulation resistance	10,000 pieces	15663458	10.7	53	16980804	8.4	44	30371457	78.9
Electric connecting element		884699	27.6	71	1055639	19.3	82	1641053	55.5
Electrical relay	10,000 pieces	118398	68.4	30	150665	27.2	31	185680	23.2
Magnetic materials, inductor and transformer（1）	10,000 pieces	2250628	16.8	101	2524580	12.2	116	3063248	21.3

Magnetic head	10,000 pieces	16109	-66.6	12	20612	27.9	11	16662	-19.2
Electroacoustic device	10,000 pieces	78228		49	91796	17.3	57	96338	5.5
Piezoceramics and ultrasonic component	10,000 pieces	82903	-62.0	20	115608	39.4	20	172144	48.9
Sensing component	10,000 pieces	73249	77.3	39	75526	3.1	39	160520	112.5
Piezoelectric quartz crystal component	10,000 pieces	285579	51.2	30	233318	-18.3	39	530936	127.6
Thick-film hybrid integrated circuit	10,000 pieces	12278	54.6	20	10681		17	12386	16.0
Ammeter used for electronic equipments	10,000 pieces	121	-67.2	6	152	25.6	5	66	-56.6
Printed circuit board	Square meters	37281610	126.2	52	55776498	49.6	62	66193287	18.7
Electronic fiber and cable	Km	17377800	-16.2	130	18504773	6.5	173	34096591	84.3

Primary cell	10,000 pieces	298828	-2.4	20	199881	-33.0	18	225543	12.8
Alkaline and lithium storage battery（2）	KVAH	709069		18	3538093	398.9	16	4658971	31.7
Micro motor	10,000 sets	61919	-9.7	56	116168	87.6	56	137187	18.1
Other electronic components and parts	10,000 pieces	10486069	21.6	34	16794514	60.1	42	11947980	-28.9

Remarks:

1. Such records as below the PCB are not included in the total number of electronic components. The new statistical classified catalog will be applied from 2002.

2. (1) Including deflecting coil and line output transformer.

3. (2) The lead acid storage battery and the physical power source are not included in it.

4. Data source: Department of Economics Reform and Running of China Ministry of Information Industry (MII); parts of data are adjusted.

Table 4 Sales revenue of the product of electronic component industry from 2003 to 2005

Item names	Sales revenue of 2003（10, 000 yuan）	2004			2005		
		Number of enterprises	Sales revenue （10, 000 yuan）	Growth rate （%）	Number of enterprises	Sales revenue （10, 000 yuan）	Growth rate（%）
Electronic components					31623	85292545	

Including: enterprises above designated level	30995080	6852	44242941	42.7	8989	64422463	45.6
Including: power & electronics manufacturing industry					3852	7723679	
Including: enterprises above designated level	2773830	539	4135588	49.1	731	5446402	31.7
Electronic parts and components manufacturing industry					11189	37566289	
Including: enterprises above designated level	16573564	2369	21871139	31.9	2961	30217061	38.2
PCB manufacturing industry					1623	12063159	
Including: enterprises above designated level	3191548	251	4822726	51.1	535	11039852	128.9
Micro machine manufacturing industry					2889	8925284	
Including: enterprises above designated level	2510993	765	5513953	119.6	982	7137379	29.4

Electric wire and cable manufacturing industry					8951	9315278	
Including: enterprises above designated level	1287355	2219	1823653	41.6	2824	2628019	44.1
Optical fiber and cable manufacturing industry					325	2232771	
Including: enterprises above designated level	2109865	96	2187693	3.7	124	2051631	-6.2
Battery manufacturing industry					2795	7466085	
Including: enterprises above designated level	2547925	613	3888190	52.6	832	5902118	51.8

Remarks:

1. The new statistical classified catalog will be applied from 2003.

2. Data source: Department of Economics Reform and Running of China Ministry of Information Industry (MII).

Table 5 Output of electronic component products from 2003 to 2005

Name of products	Unit	2003		2004		2005	
		Output	Growth rate（%）	Output	Growth rate（%）	Output	Growth rate（%）

Electronic components	10,000 pieces	37780203	11.0	50550439	33.8	70796665	40.1
Capacitor	10,000 pieces	18532948	14.4	28706744	54.9	32520980	13.3
Resistance and regulation resistance	10,000 pieces	15635156	8.1	17405833	11.3	32302143	85.6
Electric connecting element	10,000 pieces	920533	29.8	1088506	18.2	1679811	54.3
Electrical relay	10,000 pieces	118905	67.4	155968	31.2	186048	19.3
Magnetic materials, inductor and transformer（1）	10,000 pieces	2291543	17.6	2592250	13.1	3073825	18.6
Magnetic head	10,000 pieces	15944	-66.8	21155	32.7	16680	-21.2

Electroacoustic device	10,000 pieces	79245		94461	19.2	99057	4.9
Piezoceramics and ultrasonic component	10,000 pieces	84890	-62.4	118940	40.1	192885	62.2
Sensing component	10,000 pieces	77541	77.5	80038	3.2	161621	101.9
Piezoelectric quartz crystal component	10,000 pieces	313199	50.2	255604	-18.3	551013	115.6
Thick-film hybrid integrated circuit	10,000 pieces	12887	57.8	11455		12536	9.4
Ammeter used for electronic equipments	10,000 pieces	115	-66.2	152	32.2	66	-56.6
Printed circuit board	Square meters	40250886	148.9	55810095	38.6	69403339	24.4

Electronic fiber and cable	Km	25436496	21.8	18529213	-27.1	33959671	83.3
Primary cell	10,000 pieces	307670	-2.5	358007	16.4	231290	-35.4
Alkaline and lithium storage battery（2）	kVAH	772213	-91.3	3794436	391.3	4712172	24.2
Micro motor	10,000 sets	62337	-8.3	118629	90.3	137710	16.1
Other electronic components and parts	10,000 pieces	10394573	24.9	16953689	63.1	12323478	-27.3

Remarks:

1. Such records as below the PCB are not included in the total number of electronic components. The new statistical classified catalog will be applied from 2002.

2. The lead acid storage battery and the physical power source are not included in it.

3. (1) Including deflecting coil and line output transformer.

4. Data source: Department of Economics Reform and Running of China Ministry of Information Industry (MII); parts of data are adjusted.

Table 6 Industrial output (current price) of electronic component industry from 2003 to 2005

Name of products	Output of	2004	2005

	2003（10,000 yuan）	Number of enterprises	Output value（10,000 yuan）	Growth rate（%）	Number of enterprises	Output value（10,000 yuan）	Growth rate（%）
Electronic components					31623	89418859	
Including: enterprises above designated level	32833177	6852	46400568	41.3	8989	65202356	40.5
Power & electronics manufacturing industry					3852	8344075	
Including: enterprises above designated level	2883062	539	4206189	45.9	731	5551623	32.0
Electronic parts and components manufacturing industry					11189	39145646	
Including: enterprises above designated level	17356112	2369	22800211	31.3	2961	30610765	34.3
PCB manufacturing industry					1623	12243387	
Including: enterprises above designated level	3380438	251	5083844	50.4	535	11077598	117.9

Micro machine manufacturing industry					2889	9337908	
Including: enterprises above designated level	2694017	765	5746001	1132.9	982	7283007	26.8
Electric wire and cable manufacturing industry					8951	10085418	
Including: enterprises above designated level	1364992	2219	1893039	38.7	2824	2640336	39.5
Optical fiber and cable manufacturing industry					325	2346865	
Including: enterprises above designated level	2447800	96	2549218	4.1	124	2119504	-16.9
Battery manufacturing industry					2795	7915559	
Including: enterprises above designated level	2706756	613	4122066	52.3	832	5919524	43.6

Remarks:

1. The new statistical classified catalog will be applied from 2003.

2. Data source: Department of Economics Reform and Running of China Ministry of Information Industry (MII).

Table 7 Ratio of all economic parameters of all the enterprises above designated level to those of the whole industry in 2005

Item names	Ratio to whole enterprises（%）	Ratio to total assets（%）	Ratio to total industrial output valu（%）	Ratio to output value of new products（%）	Ratio to export turnover（%）	Ratio to industrial added value（%）	Ratio to sales revenue（%）	Ratio to gross profits（%）	Ratio to total tax（%）	Ratio to employed persons（%）
Electroniccomponents industry	28.4	62.3	72.9	100.0	98.6	78.0	75.5	67.1	91.6	77.0
Power electronic component manufacturing industry	19.0	54.6	66.5	100.0	97.6	74.4	70.5	64.4	92.8	69.5
Electronic components and accessories manufacturing industry	26.5	68.3	78.2	100.0	98.5	83.3	80.4	76.9	93.5	81.3

PCB manufacturing industry	33.0	84.1	90.5	100.0	99.5	92.6	91.5	101.3	95.1	87.4
Micromachine manufacturing industry	34.0	68.5	78.0	100.0	99.5	75.6	80.0	56.8	94.0	84.5
Electrical wire and cable manufacturing industry	31.6	18.8	26.2	100.0	78.1	31.1	28.2	13.3	64.3	22.9
Optical fiber and cable manufacturing industry	38.2	76.3	90.3	100.0	97.8	92.3	91.9	133.5	98.8	83.9
Battery manufacturing industry	29.8	55.1	74.8	100.0	99.1	82.1	79.0	96.2	93.5	77.4

Remarks:

Data source: Department of Economics Reform and Running of China Ministry of Information Industry (MII)

Table 8 Main economic parameters completed by enterprise of different scales in electronic components industry

Item names	Enterprise scales	Total assetscontribution ratio（%）	Asset-liability ratio（%）	Turnover ratio of circulation assets（%）	Ratio of profits to Total Industrial Costs（%）	Overall labor productivity（%）	Product sales ratio（%）

Power electronic components manufacturing industry	Above designated level Below designated level	9.80 4.88	56.09 49.45	1.76 8.79	6.23 7.64	80321 62902	96.69 83.61
Electronic components and accessories manufacturing industry	Above designated level Below designated level	8.43 4.91	56.36 46.93	2.16 5.12	5.43 6.12	70514 61143	97.65 86.35
PCB manufacturing industry	Above designated level Below designated level	7.68 0.38	58.85 49.97	2.18 1.95	6.21 -0.78	101311 56205	96.74 89.55
Micromachine manufacturing industry	Above designated level Below designated level	9.72 11.89	57.90 55.09	2.62 5.27	4.41 12.25	46351 81775	97.79 87.23

Electrical wire and cable manufacturing industry	Above designated level Below designated level	10.32 10.47	60.07 51.78	2.32 53.52	4.61 10.68	155098 102158	98.46 90.27
Optical fiber and cable manufacturing industry	Above designated level Below designated level	6.44 -1.99	50.96 43.28	1.44 1.86	3.47 -9.33	184010 79965	98.44 79.33
Battery manufacturing industry	Above designated level Below designated level	8.27 0.84	59.53 49.54	2.04 5.57	4.97 0.67	82576 61483	98.38 80.20

Remarks:

Data source: Department of Economics Reform and Running of China Ministry of Information Industry (MII)

Table 9 Import and export trade of electronic component products from 2003 to 2005

Monetary unit: 10,000 dollars

Names of products	Year 2003		Year 2004		Year 2005			
	Import value	Export value	Import value	Export value	Import value	Growth rate（%）	Import value	Growth rate（%）

Total	1901795	1325135	2404092	1577047	2844827	18.3	1939177	22.9
Capacitor	307987	101781	379850	128939	435912	14.8	147884	14.7
Resistance and regulation resistance	92851	36709	118812	46579	127019	6.9	53592	15.0
Magnetic materials	31925	47756	35705	59440	45653	27.8	66788	12.4
Magnetic head	3474	7216	3405	6055	3285	-3.5	5607	-7.4
Thick-film hybrid integrated circuit	472783	193419	567757	70238	668114	17.7	81144	15.5
Hummer	4243	3132	4809	3115	4492	-6.6	2596	-16.6
Piezoelectric quartz crystal component	96591	50485	123738	62828	138527	11.9	70585	12.3
Electrical relay	23890	28302	31673	34135	34808	9.9	38580	13.0
Switch lamp holder	61294	48286	76634	57633	86649	13.1	70978	23.1
Connector	105393	51141	120194	73790	167138	39.1	88661	20.1

Electro acoustic device	49483	198322	71320	269487	98730	38.4	342722	27.2
Sound head	13552	23621	17235	12020	3935	-54.7	3733	-68.9
Micro motor	159718	189275	176922	214690	187854	6.18	234081	9.0
Optical cable	4516	3993	4003	7159	3177	-20.6	13138	83.5
Electronic wire and cable	100640	69727	134484	107694	155131	17.7	146833	36.3
PCB	363385	239811	507251	382057	657039	29.5	533816	39.7
Cadmium-nickel storage battery	23623	32161	30300	41193	27377	-9.6	38438	-6.7

Remarks:

1. In order to compare with the historical data, the import and export trade data of some accessories for electronic components and some products such as power capacitor, transformer and inducer difficult to tell whether belong to electronic products are not included in this table.

2. Data source: China customs.

Table 10 Import and export data of electronic component products from 2003 to 2005

Names of products	Unit	Year 2003		Year 2004		Year 2005	
		Import volume	Growth rate（%）	Import volume	Growth rate（%）	Import volume	Growth rate（%）

Capacitor	10,000 pieces	47779251	23.7	69627303	45.7	83512895	19.9
Resistance and regulation resistance	10,000 pieces	30548047	-16.9	46670412	52.8	50784031	8.8
Magnetic materials	Kilogram	56635579	0.03	74181552	31.0	73534279	-0.9
Magnetic head	10,000 pieces	15962	-24.7	15555	-2.5	14427	-7.3
Thick-film hybrid integrated circuit	10,000 pieces	354984	7.4	422798	19.1	546326	29.2
Hummer	10,000 pieces	48239	12.5	51618	-90.9	47160	-8.6
Piezoelectric quartz crystal component	10,000 pieces	853699	5.9	984188	15.3	1078826	9.6
Electrical relay	10,000 pieces	60772	21.2	76861	26.4	79227	3.1
Switch lamp holder	10,000 pieces	686116	16.7	812325	18.4	896640	10.4

Plug-and-socket	10,000 pieces	1148974	15.6	1139457	-0.8	1371030	20.3
Electro acoustic device	10,000 pieces	148385	27.9	179103	20.7	209251	16.8
Sound head	10,000 pieces	7609	-16.7	3436	-54.8	1690	-50.8
Micro motor	10,000 sets	165242	4.6	164128	-0.7	162926	-0.7
Optical cable	Kilogram	4513122	-52.8	4536083	0.5	1511229	-66.7
Electronic wire and cable	Kilogram	167585538	-12.4	218148475	30.2	214041519	-1.9
PCB	10,000 pieces	1063137	29.0	1348977	27.0	1765776	30.9
Cadmium-nickel storage battery	10,000 pieces	54568	1.9	73720	35.1	69823	-5.3

Remarks:

1. In customs catalog, the measuring unit of capacitor and resistance was thousand pieces before 1993 and changed to be Kilogram during 1994 to 2002 and Kilogram/ thousand pieces in 2003. The measuring unit of PCB has been changed into 10, 000 pieces/kilogram.

2. In order to compare with the historical data, the import and export trade data of some accessories for electronic components and some products such as power capacitor, transformer and inducer difficult to tell whether belong to electronic products are not included in this table.

3. Data source: China customs.

Table 11 Import and export data of electronic component products from 2003 to 2005

Names of products	Unit	Year 2003		Year 2004		Year 2005	
		Export volume	Growth rate（%）	Export volume	Growth rate（%）	Export volume	Growth rate（%）
Capacitor	10,000 pieces	22962401	40.1	28684566	24.9	43985717	53.3
Resistance and regulation resistance	10,000 pieces	20546214	49.2	30416001	48.0	38013411	25.0
Magnetic materials	Kilogram	164226415	10.6	196437865	19.6	202405954	3.0
Magnetic head	10,000 pieces	24795	-11.3	22155	-10.6	16419	-25.9
Thick-film hybrid integrated circuit	10,000 pieces	401724	28.0	259351	-35.4	307554	18.6
Hummer	10,000 pieces	26567	-18.7	26947	1.4	23763	-11.8
Piezoelectric quartz crystal component	10,000 pieces	574349	28.8	676369	17.7	742019	9.7

Electrical relay	10,000 pieces	105923	11.6	129379	22.1	137414	6.2
Switch lamp holder	10,000 pieces	795756	23.2	900647	13.2	955939	6.1
Plug-and-socket	10,000 pieces	487284	32.8	554619	13.8	650856	17.4
Electro acoustic device	10,000 pieces	299136	21.4	382795	27.9	454887	18.8
Sound head	10,000 pieces	3718	-43.3	2311	-37.8	991	-57.1
Micro motor	10,000 sets	318456	6.8	326842	2.6	315391	-3.5
Optical cable	Kilogram	4670703	33.3	8154343	74.6	14859798	82.2
Electronic wire and cable	Kilogram	249269076	37.8	340771395	36.7	405061724	18.9
PCB	10,000 pieces	628289	22.3	1014829	61.5	1216913	19.9
Cadmium-nickel storage battery	10,000 pieces	64956	30.4	82612	27.2	80544	-2.5

Remarks:

1. In customs catalog, the measuring unit of capacitor and resistance was thousand pieces before 1993 and changed to be Kilogram during 1994 to 2002 and Kilogram/ thousand pieces in 2003. The measuring unit of PCB has been changed into 10, 000 pieces/kilogram.

2. In order to compare with the historical data, the import and export trade data of some accessories for electronic components and some products such as power capacitor, transformer and inducer difficult to tell whether belong to electronic products are not included in this table.

3. Data source: China customs.

Table 12 Sales revenue of the first 20 enterprises among the 19th Top 100 Electronic Component Enterprises

Comprehensive No		Names of enterprise	Year 2005			
Year 2006	Year 2005		Sales revenue （10，000 yuan））	Ranking of sales revenue	Ranking of gross profits	Ranking of total assets
1	1	Shanghai Feilo Co.,Ltd.	536776	1	1	1
2	3	Hengtong Group Co.,Ltd.	536394	2	4	2
3	2	Yongding Group Co.,Ltd.	474624	3	5	5
4	4	Jiangsu Tongguang Group Co.,Ltd.	350812	5	3	11
5	6	Hengdian Group Dongci Co.,Ltd.	276014	8	7	4
6	5	Futong Group Co.,Ltd.	311365	7	13	3
7	9	Guangdong Shengyi Sci Tech Co.,Ltd.	165959	13	8	9

8	7	Zhejiang Fuchunjiang Communication Group Co.,Ltd.	350913	4	20	7
9	10	Xiamen TDK Co.,Ltd.	321731	6	17	10
10	13	Kaiping Elec Eltel Electronics Co.,Ltd.	157077	16	6	14
11	20	Ruisheng Acoustics Technology Co.,Ltd.	107374	22	2	12
12		EPCOS (China) Investment Ltd	162043	14	12	13
13	10	Hualun Group	209265	9	23	8
14	12	Shanghai KYOCERA Electronics Co.,Ltd.	190428	11	24	17
15	8	Wuxi Jingshi Electronics Co.,Ltd.	159780	15	18	24
16	30	Zhejiang Fehong Communication Group Co.,Ltd.	101299	26	9	23
17	22	Ningbo Xiangyang Group Co.,Ltd.	122070	19	11	32
18	26	Jiangsu United Technology Group Co.,Ltd.	112635	21	16	30
19	17	Xiamen Hongfa Electroacoustic Co.,Ltd.	101396	25	15	27
20	25	Tianjin Zenmay Electro-acoustic Equipment Company	206866	10	30	31

Remarks: date source: China Electronic Components Association

Table 13 Sales revenue and industrial distribution of different enterprises among the 19th Top 100 Electronic Component Enterprises

Industrial classification	Enterprises	Sales revenue（10,000 yuan）
Comprehensive enterprises	14	1881867
Capacitor	16	832666
Resistance and regulation resistance	5	145411
Magnetic materials	6	480870
Electronic transformer	4	117813
Electronic ceramic device	4	68004
Inducer	1	10015
Piezoelectric quartz crystal	3	46926
Control relay	5	228214
Electrical adapter	5	144284
Micro motor and components	6	269446
Electro acoustic device	9	728382
PC	10	805785
Optical fiber and cable	12	2665929
Total	100	8425609

Remarks: date source: China Electronic Components Association

Table 14 Sales revenue of the first ten enterprises among the 5th Top 100 PC Enterprises

No	Names of enterprises	Sales revenue（10, 000 yuan）
1	Guangzhou Tianli PCB Co.,Ltd.	270000
2	Lianneng Technology (shenzhen) Co.,Ltd.	256899
3	SCSC (Suzhou)	181649
4	Guangdong Shengyi Sci Tech Co.,Ltd.	165959
5	Kaiping Elec Eltel Electronics Co.,Ltd.	157077
6	Wus electronic (Kunshan) Co.,Ltd.	153037
7	Huatong Computer (huizhou) Co.,Ltd.	149000
8	Mingxing Electronic (Guangzhou Nansha) Co.,Ltd.	148672
9	Topsearch printed Circuits (Shenzhen) Co.,Ltd.	136908
10	Kalex Multi-Layer Circuit Board (Zhongshan) Co.,Ltd.	110000

XI. Special electronic materials industry

1. Overview

In 2005, the last year of the 10th Five-Year Plan, with the support of the relevant departments of China and under the participation of the enterprises, great progress had achieved by special electronic materials industry. China electronic materials industry maintained stable development, which pushed by the development of semiconductor, solar energy photovoltaic industry and flat panel display industry. The number of enterprises had exceeded 1,500; the number of employed persons had been around 100,000; the total income of the industry as a whole was around 55 billion yuan, accounting for 1.3% of the sales revenue of information industry. The sales revenue from copper clad laminate materials, magnetic materials and semiconductor materials was around

47 billion yuan. Total exports reached around US$ 2.5 billion.

2. Production and sales

Semiconductor silicon materials

Polysilicon

The annual output, annual capacity and actual total output of China's polysilicon industry still maintained around 100 tons, 400 tons and 80 tons respectively for years. In 2005, the need for polysilicon of domestic IC and silicon solar cell hit around 3,000 tons, over 95% of which need to import. The balance of supply-demand relationship loosened seriously, which become a bottleneck holding back the development of the industry. In December 2005, under the support of the relevant department of China and by the efforts of China Nonferrous Engineering and Research Institute and Luoyang Zhonggui Hi-Tech Co.,Ltd. as well as other units, an annual 300-ton polysilicon project had put into operation. Therefore, the polysilicon industry formed its industrial pattern on basis of Luoyang Zhonggui Hi-Tech Co.,Ltd., Emei Semiconductor Materials Plant and Leshan Xinguang Silicon Industry Co.,Ltd..

Silicon single crystal

The average annual growth rate of China's silicon single crystal had been around 30% by 1995. For several years, the annual output of silicon single crystal in Chinese mainland grew twenty to thirty times. In 2004, the output of silicon single crystal exceeded 1,700 tons by the push of the development of solar battery. In 2005, the output of silicon single crystal hit 2,700 tons, increasing 47%. The total sales revenue hit 5 billion yuan. The output of silicon single crystal used for solar battery hit around 2,000 tons. The export volume of silicon single crystal in 2005 hit 1 406.31 tons; export reached US$ 136.5873 million. Export volume of single crystal silicon wafers reached 479.38 tons; exports hit US$ 116.7408 million. Main exported enterprises in solar-grade monocrystalline silicon include: Hebei Jinglong Group Co.,Ltd. (Including Hebei Ningjin Songgong Semiconductor Co.,Ltd., Ningjin Changlong Semiconductor Plant and Ningjin Ganglong Electronic Materials Co.,Ltd.) and Langfang Songgong Semiconductor Co.,Ltd.. The products of the abovementioned enterprises were mainly exported to Japan. The main imported

enterprises engaged in the production of silicon chip used for semiconductor devices include: Grinm Semiconductor Materials Co.,Ltd., Ningbo Lili Semiconductor Materials Co.,Ltd., Luoyang Monocrystalline Silicon Group Co.,Ltd., Shanghai Hejing Silicon Material Co.,Ltd. and Zhejiang Wangxiang Silicon-Peak Electronic Co.,Ltd.. The general level of China's monocrystalline silicon products was very low. The products structure can manufacture parts of IC and chips used for all kinds of discrete devices as well as 8-inch polished silicon chips on basis of production of 4, 5 and 6 inches single crystal silicon wafers. Grinm Semiconductor Materials Co.,Ltd. and Zhejiang University State Key Lab of Silicon Materials had made profound scientific and technological achievements and established monthly 10,000-chip small pilot production line in term of 12-inch polished silicon chips. China had ranked among the world's top level in research and production of large-size silicon chips.

GaAs Materials

GaAs was widely used in Electronic and micro-machine industry. China's GaAs materials made a rapid progress in industrialization. All the research institutes holding GaAs materials technologies were carrying out the industrialization construction. Meanwhile, some foreign enterprises expressed their confidence in the future development prospect of China's GaAs materials industry and began to take part in the industrialization. Therefore, the industrialization constriction of GaAs materials industry expressed vigorous development. At time of purchasing the production line of US' Litton Airtron, China Electronic Technology Group Corporation No 46 Research Institute relies on its own force to develop the production technology for VB-GaAs single crystal and carried out the industrialization in semi-Insulation GaAs materials and GaAs materials used for lower resistance photoconducting device for purpose of realization the annual output of 200,000 pieces photoconducting GaAs substrates and 150,000 to 200,000 pieces of semi-Insulation GaAs materials. Beijing Zhongke Jiaying Semiconductor Co.,Ltd. was established to carry out the industrialization work in semi-Insulation GaAs materials and epitaxy materials on basis of the technologies of Institute of Semiconductors of Chinese Academy of Sciences and under combination of Beijing Beixin Building Material Group Co.,Ltd. and other units. Guorui Electronic Materials Co.,Ltd. was established to manufacture the GaAs materials used for

photoconducting devices for years on basis of the HB-GaAs technology developed by General Research Institute for Nonferrous Metals (GRINM). Other enterprises such as Daqing Jiachang, Beijing Meixi Semiconductor Materials Co.,Ltd. (formerly Fuzhou Jingzhen Semiconductor Co.,Ltd.) and Xinxiang Shenzhou Crystal Technolgy Co.,Ltd. had also carry out the industrialization in GaAs materials.

Piezoelectric crystal materials

Piezoelectric crystal materials are raw materials used to manufacture harmonic oscillator, oscillator, filter, SAW device and optical device. In 2005, the domestic output of China's crystal materials hit 2,000 tons, but the domestic enterprises were small and decentralized; the products were dominated by medium and low level ones; the main equipment were mainly the small-sized pressure pan with diameter from 250 mm to 280 mm.

Magnetic materials

Presently, China's industry scale of magnetic materials has ranked first in the world. In 2005, the output of magnetic materials hit 450, 000 tons. The output of hard magnetic ferrite hit 290, 000 tons. The output of soft magnetic ferrite hit 160, 000 tons. The total sales revenue reached around 25 billion yuan. The export volume accounted for 50% of that of magnetic materials. The medium and low end products held 60% market share in international magnetic materials market. The high-end products were very competitive. The output of high-performance soft magnetic ferrite materials PC40（μ>10 000）and hard magnetic ferrite (Double 4,000 Kw-type magnetic component) accounted for 30% of that of magnetic materials in the whole year. In view of the development of the industry as a whole and compared with the magnetic materials industry in foreign advanced countries, China's magnetic materials industry faced many problems such as decentralized location, weak management, low product standard and unstable quality.

From 1996 to 2000, the output of domestic sintered neodymium iron boron increased 1.5 times and its average annual growth rate hit 20%. The accumulative sale for five years reached 6.6 billion yuan and foreign exchange earning hit US$ 500 million. Presently, there are three enterprises with annual output of sintered neodymium iron boron over 1, 000 tons. Ningbo region in Zhejiang, Beijing-Tianjin region and Shanxi have become three major production bases in

sintered neodymium iron boron. The total output of sintered neodymium iron boron of these regions has accounted for over 90% of sintered neodymium iron boron of the whole country.

Copper clad laminate

Copper Clad Laminate (CCL) is the main material used to manufacture PCB.

In 2005, the annual output of CCL reached around 200.55 million square meters, a 20.7% increase on a year-on-year basis. The output of glass fabric substrates hit 111.60 million square meters. The output of paper substrates reached 70.85 million square meters. The output of compound substrates reached 18.10 million square meters. The total sales revenue of the whole year hit 16.9 billion yuan, increasing 26%. The exports reached US$ 570.18 million. The annual imports increased 5.66%. The large trade deficit existed in the import and export trade of copper clad laminate mainly due to the impact of the imported products of Taiwan region and South Korea. The China's output of CCL ranked the second in the world.

Presently, there are ten enterprises engaged in CCL production. The large enterprises include: Jiantao Build-Up Board Co.,Ltd., Guangdong Shengyi Sci Tech Co.,Ltd., Hongren Electronic Industry Co.,Ltd., Hezheng Science&Technology Co.,Ltd., Lianmao Electronics Co.,Ltd., Nan Ya Electronic Materials (Kunshan) Corp Ltd, Suzhou Matsushita Electric Works Co.,Ltd., Zhaoyuan Jinbao Electronics Co.,Ltd., Shnghai Nanya Technology Group Co.,Ltd. and Shenzhen Pacific Insulating Material Co.,Ltd.. All domestic enterprises can manufacture the CCL materials with size of 12μm, 18μm, 35μm and 70μm. The product quality of the major enterprises had reached the international advanced level.

Electronic ceramic materials

China has become the major MLCC manufacturer in the world. The Y5V, X7R and NPO ceramic materials used for MLCC have put into mass production. The Ni electrodes base-metal ceramic was under reseach and development. In 2005, the global need for ceramic materials reached 15,000 tons. The need for base-metal anti-reduction ceramic materials hit 12,000 tons. The main goal of manufacturer engaged in MLCC ceramic materials production is to research and develop as well as manufacture Ni electrodes MLCC anti-reduction ceramic materials in large quantities.

There are hundreds of institutes and enterprises engaged in medium ceramic materials R&D and

production in China. They have made a batch of scientific and technological achievements, reaching the international advanced level in recent years. Some of the achievements have won proprietary intellectual property rights. The annual output of all kinds of medium ceramic materials reached over 1,800 tons. Some kinds of ceramic materials possessed the same performance as the foreign products of the same kind. Some products surpassed the foreign products in electronic performance and processing.

Compared with the microwave medium ceramic materials of foreign countries, there is still big gap between domestic microwave medium ceramic materials in technology, product types and production scale. The substituted materials of lead ceramic have become the key development trend in ceramic materials for the coming two years. Guangzhou Jiesai Technology Company Limited of China Electronic Technology Group Corporation No 10 Research Institute has made great progress in research and development.

Polypropylene film for capacitors

Before the 1980s, the polypropylene film for capacitors mainly depended on import from Japan, France and Germany. After 1980s, the output of polypropylene film reached over 80,000 tons on basis of technical improvement and self-innovation. In 2003, the sale volume of polypropylene film for capacitors hit 26, 342 tons and the sales revunes reached 1.23041 billion yuan. There were three enterprises which output exceeded 2, 000 tons. The sales revenue of the three enterprises hit 682.46 million yuan, accounting for 55.5% of that of polypropylene film industry. In 2004, the annual output of most enterprises exceeded 2, 000 tons. In 2005, the sales revenue of the first three enterprises accounted for 28.4% of that of the whole industry. It was proved that the industry was highly concentrated.

In recent years, parts of original enterprises intensified their investment volume and expanded the productivity. Furthermore, joint venture, newly-built enterprise and parts of enterprise engaged in the production of packaging film originally also entered into the polypropylene film industry after improving the production lines. These enterprises strengthened the competition in the market. According to incomplete statistics, there were 136 domestic enterprises engaged in the production of the polypropylene film for capacitors totally. They were mainly located in the Pearl River Delta

and the Yangtze delta as well as Sichan. The major manufacturing enterprises include: Anhui Tongfeng Electronics Co.,Ltd., Sichuan Dongfang Insulating Material Co.,Ltd., Jiangmen Enrichment Industrial Limited, Jiangsu Nantian Group Co.,Ltd. and Zhejiang Nanyang Electronic Film Co.,Ltd.. In 2005, the annual output of the abovementioned enterprises totally exceeded 80,000 tons (calculated by 7—8μm), which held over 60% of the domestic market. The growth rate was very rapid. The annual output of Anhui Tongfeng Electronics Co.,Ltd. hit 16, 000 tons and its production scale ranked the first in the world.

The scale of China's polypropylene film industry for capacitors leaped into the front ranks of the world. The product development, production technology, processing technique and application technology also reached the international advanced level. During the production, domestic enterprises adopted the international advanced standard such as IEC 60674 *Biaxially Oriented Polypropylene Film for Capacitors*. The quality of the products reached international advanced level of the international products of the same kind or the same level of the international products of the same kind. At time of being exported to foreign countries, the domestic products not only met the need of the domestic users but also can be used as the substituted materials.

In addition, by attaching profound attention to the construction of self-innovation and the improvement of core technology, domestic enterprises engaged in production of polypropylene film for capacitors relied on its own force to develop some products such as rough-surface biaxially oriented polypropylene film for capacitors and high temperature resistant polypropylene film for capacitors. The main enterprises had established the technical innovation system on basis of the independent intellectual property rights and founded the industrial basis and the industrial chain. The number of patents held by the enterprises increased year by year. The enterprises also carried out technical cooperation and established the strategic cooperation relationship with the multinationals. The export volume of the products held independent brand grew increasingly.

Electrode foil for aluminum electrolytic capacitor

In 2005, the need for electrode foil for aluminum electrolytic capacitor reached 90 million square meters and its market share hit 3.5 billion yuan. The market shares of low and medium-high voltage electrode foils accounted for 50% of the total market share respectively. Domestic output

of electrode foil for aluminum electrolytic capacitor reached around 49 million square meters. So another 40 million square meters of electrode foils needed to supply by means of import. The imported products mainly include high voltage-high capacity and special high-end etch surface of aluminum foil and formed foil (for example, aluminum electrolytic capacitor for flash lamp and electrode foil for high ripple current aluminum electrolytic capacitor). Such electrode foils for special specification were under research and development period.

There are 28 enterprises engaged in the production of electrode foil for aluminum electrolytic capacitor in China. Seven enterprises mainly produced aluminium foil. The main manufacturers include HEC, Jiangsu United Technology Group Co.,Ltd., Yangzhou Shengda Group (Gaoyou City Shengda Electronics Co.,Ltd.), Fengbin Electronic Technology (renhua) Co.,Ltd., Zhaoqing Huafeng Electronic Aluminum Foil Co.,Ltd., Zhaoqing Gaoyou Aluminum Foil Co.,Ltd., Nanhui Electronic Materials Co.,Ltd., Huaibei Dongci Electronic Co.,Ltd., Sancon Jetwell (Haimen) Electronics Co.,Ltd. and Guangxi Hezhou City Guidong Electronics Co.,Ltd.. The annual sales revenue reached around 2 billion yuan. The output hit around 49 square meters. The output of low - medium voltage foils and medium-high voltage electrode foil accounted for 50% of the total output respectively.

The production technique of domestic electrode foil mainly adopted two processing such as muriatic acid and sulfuric acid (environment-friendly) and dichromic acid and hydrofluoric acid. These two processing were increasingly developed into environment-friendly processing. The types of formed foil include low-voltage and medium-high voltage foils. The specifications include 20μm—104μm. The withstand voltages were ranging from 50V, 100V, 160V, 250V, 400V to 500V.

At the beginning of 1990s, the margin low-voltage formed foil technique and performance between China and foreign countries was narrow. Yet the large gap was formed on the product performance between China and foreign countries due to the development environment and other reasons. Therefore, foreign low-voltage foils flooded into China market, which become a serious threat for domestic industry. On basis of key technical breakthrough (including environment-friendly production processing and production line improvement) make by HEC,

Jiangsu United Technology Group Co.,Ltd., Yangzhou Shengda Group, Dongci Aluminum Industry Group and other enterprises and by international advanced electronic control technology, the production process was controlled effectively and the mechanical behavior and the presentation quality were also improved notably. The general quality of low-voltage formed foils was increase a lot. The production scale and market share has also boosted. The domestic need for aluminum electrolytic capacitor was basically satisfied.

The starting point for medium-high voltage foil was very high. HEC, Dongci Aluminum Industry Group and other enterprises improved the product's capacity consistency, mechanical strength or other indices such as leakage current reach the level of imported products by applying the domestic aluminum foil materials and corrosion process——independent intellectual property right. Furthermore, compared with imported foils, the price of the domestic foils was also competitive. In recent years, Japan, South Korea and Taiwan region in China transferred the production lines of aluminum electrolytic capacitor to Chinese mainland. It not only provided domestic electrode foil production with market space but also supplied profound opportunities to bring China's electrode foils into international market. The products from main domestic enterprises accounted for over 60% of market share in domestic market. The export volume in the whole year exceeded 3, 100 tons. The export volume hit US$ 42.74 million. The main exported countries and regions include South Korea, South East Asia and Taiwan region.

Tin solder

In December 2004, the debut of Lead-Free Solder Draft Standard of China expressed the top priority given to the lead-free work of the domestic solder industry. In 2005, the tin-solder output of domestic solder industry reached 88,000 tons, of which the output of lead-free solder hit 14,000 tons.

The product quality of general domestic solder wire and bar was the same with the foreign product. But the there was still large gap between the domestic high-end products and the foreign ones. We can see it from the following aspects: firstly, there were gaps between the production equipments, processing techniques and product quality in tin power and BGA tin balls; secondly, the product performance-free flux technology was inferior to the foreign technology; fourthly, the R&D ability

for new product was weak; fifthly, market share of lead-free solder products was low in domestic market.

Optoelectronic materials

Laser crystal materials

There were 13 enterprises engaged in production of laser crystal materials in China. The main products included Nd: YAG materials and its quality reached the international advance level. The products were exported to international market.

Liquid crystal materials

The domestic liquid crystal materials were mainly the liquid crystal materials for TN-LCD. It accounted for 80% of market shares in global market in liquid crystal materials for TN-LCD. This kind of materials characterized by large sales volume and low production value. Domestic enterprises can produce small parts of low-end liquid crystal materils for STN-LCD other than liquid crystal materials for TN-LCD. The TFT compound liquid crystal product was still a margin in domestic market. Presently, parts of enterprises have possessed the R&D and production capacities of TFT single crystal and sold the TFT intermediate product.

ITO conducting glass

The domestic need for ITO conducting glass reached 10 million square meters. There are 16 enterprises mainly engaged in the production of ITO conducting glass at present. The output reaches 0.1 billion pieces (totally 14 million square meters, calculated by 14×16 inches). The supply has increasingly exceeds demand in ITO conducting glass production. The product standard needed to be improved.

Polaroid

70% of the polaroid relied on import in China. The annual domestic output only reached 0.4 million square meters. The major products were TN poloroids and few STN polaroids.

Optical fiber materials

China’s consumption on optical fiber ranked the third in the world, next only to the US and Japan. China’s optical fiber industry has formed the optical fiber preform rod industrial pattern dominated by Wuhan Changfei Optical Fibers ＆ Cables Co.,Ltd.. The quality of major optical

fiber products reaches the first class in the world. Parts of products are exported to international market. In 2005, the output of optical fiber preform rod hit 19 million square meters, accounting for 10% of the market share in global optical fiber preform rod market. The product pattern was dominated by single-mode optical fiber and included multi-mode optical fiber, polarization maintaining optical fiber and other special optical fiber such as rare earth. The drawing capacity of optical fiber was more than sufficient for domestic need. The production scale exceeded 30-million square meters/per year.

Major fine chemical materials

High pure chemical reagents

There are ten enterprises engaged in the production of high pure chemical reagents in China. The market structure of the products is mainly composed of sulphuric acid, nitric acid, hydrochloric acid, hydrofluoric acid and 2-propanol. Presently, the annual demand for the reagents used for electronics hit 28,000 tons. The output of domestic high pure chemical reagents of MOS grade reaches 5,000 tons. The metallic contamination content of parts of semic-8 standard product is lower than 1 PPb. But the grain diameter has not reached the standard. The high pure chemical reagents below 0.5μm are under research and development.

Photoresist

There are seven enterprises engaged in the production of photoresist. Few enterprises possess the capacity of mass production. Its market structure of products is mainly composed of UV positive resist, negative resist and electron beam resist (or Grade G and I wire resist). Presently, the total demand for UV positive resist and negative resist used for the production of medium and small-sized IC (process width is above 5μm), large-sized IC (5μm、2μm-3μm、0.8μm-1.2μm), discrete devices and LCD hit 150-200 tons/per year, which basically met the domestic need. Other types of resist have still been under research or experimental period. In recent years, with many ULSI production lines have brought in and been constructed in China, the need for 248 nm-photoresist become increasingly large. But the domestic enterprises have no ability to produce this kind of products. 193 nm-photoresist is under research and development.

Epoxy moulding compound

There are seven enterprises engaged in the research and development of epoxy moulding compound. These enterprises are as follows: Lianyungang Henkel Huawei Electronics Co.,Ltd., Eternal Electronic Materials (Kunshan) Co.,Ltd., Sumitomo Bakelite (Suzhou) Co.,Ltd. and Beijing KeHua Advanced Materials Technology Co.,Ltd.. The total annual output reached around 20,000 tons, of which the output of Lianyungang Henkel Huawei Electronics Co.,Ltd. hit 12, 000 tons/per year. The products can meet the packaging need of parts of IC and discrete devices and are mainly packaged in form of DIP and SOP. The products used for BGA and CSP package are under research and development. The domestic market need for solid moulding compound reached around 40,000 to 60,000 ton annually. Parts of products relied on import. Sumitomo Bakelite (Suzhou) Co.,Ltd. can manufacture all kinds of products used for package and holds major market share among the solely foreign-owned enterprises.

Electronic special gas

The research and development of electronic special gas has started since the 1980s. Compared with the foreign products, there is still large gap in product performance and production scale of domestic electronic special gas products due to some factors including the products' characteristics, technology and investment. Therefore, several large foreign enterprises possess the most market share of some kinds of electronic special gas products. Some domestic products such as NF3, SF6, SiHCl3 and parts of Mo are very competitive in the market. These products play an important role in balancing the price of international electronic special gas products in China.

Parts of special metal materials

Lead frame materials

The domestic lead frame materials are mainly composed of copper frame. Five enterprises are engaged in the production of lead frame strips. These enterprises are as follows: Luoyang Copper Processing Factory Industry Company, Ningbo Xingye Copper Co.,Ltd. and other enterprises. Their market scale reached around 40, 000 tons/per year to 50, 000 tons/per year. Total output hit 5,000 tons. The lead frame copper strips used for IC mainly depended on import. The degree of self-sufficiency on the lead frame copper strips used for discrete device was very high. There are ten manufacturers in lead frame. The foreign owned-enterprises include Mitsui, Fengshan and

other enterprises. The domestic enterprises mainly include Ningbo Kangqiang Electronics Co.,Ltd., Xiamen Yonghong Electronics Co.,Ltd. and Tianshui Huatian Microelectronics Co.,Ltd. (No 749 Factory).

Gold bonding wire

There are five enterprises including Zhaoyuan Heraeus Precious Metal Materials Co.,Ltd. and Ningbo Kangqiang Electronics Co.,Ltd.. In 2005, domestic output of gold bonding wire exceeded 7,000 kilogram. At present, the domestic output of gold bonding wire can meed the need of foreign-owned enterprises and some products have used for export.

3. Scientific research and new products

In 2005, the development on lead-free solder and environment-friendly materials made notable progress. Under the organization of Tin Solder Branch of China Electronics Materials Industry Association, the enterprises made investment by themselves and developed the tin-silver-copper and rare earth element lead-free alloy solder with proprietary intellectual property rights. In addition, the branch drew up the industry standard for lead-free alloy solder. The researches on moulding materials and CCL used for non-halogen elements have made great breakthrough in Institute of Chemistry of Chinese Academy of Science and some CCL manufacturers including Dongguan Shengyi Electronics Co.,Ltd..

Institute of Semiconductor of Chinese Academy of Science has made profound scientific progress with proprietary intellectual property rights in the R&D of semi-conductor; for example, temperature profile design, growth control and crystal ingot annealing technologies on large-sized (6 inches) single crystal gallium arsenide. The weight of single crystal gallium arsenide reached 5 kg. The crystal technical parameters reached the domestic and international advanced level. Institute of Semiconductor of Chinese Academy of Science also developed the 2-6 inches gallium arsenide crystal multi-wire cutting and chemical mechanical polishing. The crystal technical parameters reached the international advanced level. It invented the transmission type polarizing difference method to measure the residual stress of gallium arsenide. It developed the flip-chip GaN-based white and blue LED in flip-chip GaN-based structure LED technology and

parts of technical parameters exceeded the standard of the international devices of the same kinds in 2005. It developed a kind of design method of optical, electrical and thermal integrated flip-chip LED, which is the first flip-chip LED with thermal resistance interface and transitional thermal sink structure in the world. The comprehensive integrated technology had applied for one international patent and one domestic patent. The average percent of pass for the 12 batches (six pieces in one batch) of successive engineering researches reached 80%.

China made the breakthrough in optical fiber perform by the efforts of Changfei Optical Fiber and Cable Co.,Ltd., Zhejiang Futong Group Co.,Ltd. and Jiangsu Fasten Co.,Ltd.. The diameter of the optical fiber perform was increased from 80 mm in 2004 to 120 mm in 2005. The length of string hit 1,000 km. The attenuation value at water peak decreased to 0.29db/km. Beijing Guojing Infrared Optical Technology Co.,Ltd. had make great progress in germanic chloride used for optical fiber perform. The product performance reached the level of Germany Merck chemical Co.,Ltd.' s products of the same kind. This kind of product replaced the imported products. The market share in germanic chloride had increased from 40% to 90%. This kind of products was also exported to the international market.

4. Important engineering and key projects

In December 2005, under the support of National Development and Reform Commission, Ministry of Science and Technology and other departments and by the efforts of China Nonferrous Engineering and Research Institute and Luoyang Zhonggui High-Technology Co.,Ltd., a annual 300-ton polysilicon project had been put into operation. At that time, a 1,000-ton polysilicon project had also been under the way. It was estimated that this project would be completed at the end of 2006.

Shandong Zhaoyuan Jinbao Electronics Co.,Ltd. contracted the high-end electrolytic copper foil industrialized model project of National Development and Reform Commission and depended on its own force to develop a low cost production line with low investment and high technical level. Under the same production scale, this production line can save one third of investment used for foreign production line and reduced the production cost by 10%. The technical level of the

products reached the international advanced level.

The Zhuhai Gowin Fiberglass Co.,Ltd.' s electronic-grade glass-fiber used for CCL production has made great progress in performance and production scale, which was ranked among the world top five. Especially, the scientific research on optical fiber technology made a notable breakthrough in 2005 and promoted the development of multi-layer printed circuit board.

Beijing Crystal Photoelectric Science & Technology Inc has made great progress in the hi-tech model-engineering project in high quality crystal materials used for photoelectric information products awarded by National Development and Reform Commission. The company had developed into a integrated manufacturer in piezoelectric quartz crystal materials and optical quartz crystal materials from a enterprise mainly engaged in the production of single piezoelectric quartz materials. It became the largest and best crystal materials production base with in China.

5. Market analysis and forecasting

It is estimated that the market demand for polysilicon would exceed 3,000 tons in China in 2006. The operation of Sichan Xinguang Silicon Technology Co.,Ltd.' s thousands-ton polysilicon production line would help to relieve the relieve the tense supply and demand situation in domestic market. The growth rate of China's SIC and photoelectronic device would exceed 30%. But most products of silicon materials were the 4-inch, 5-inch and 6-inch silicon chips. In the coming several years, the output of 8-inch and 12-inch silicon chips will be increased. Two or three hi-tech industrial bases, which produce 8-inch and 12-inch polished silicon wafers and epitaxial wafers, will be established to meet the need of 100-65 nm IC. The 6-8 inches SOI and SiGe and strained silicon materials industrial model engineering projects will be founded.

It was estimated that the demand for base glass used for LCD would reach 30, 000,000 square meters/per year (including demand for TFT reached 16, 000, 000 square meters/per year and demand for TN and STN reached 12, 000, 000 square meters/per year). The domestic demand for color filter for LCD would exceed 10,000,000 square meters. The development of such materials would become the new point for economic growth in China due to the higher profits of these products.

With the implementation of UN's RoHS and WEEE Indicators and the issuance of Pollution Control and Management of Electronic Products of PRC, the advanced semi-conductor moulding demand for lead-free solder would continue to increase. In domestic market, the annual demand for lead-free solder would reach around 70,000 tons, accounting for 35% of the world use.

In brief, the growth of electronic materials would continue to increase steadily in 2006. Especially the growth of basic industry such as polysilicon would increase rapidly due to the promotion of the PV industry. Parts of electronic materials relied on import for a long time would still face such pressures including bulging price of raw materials and higher import duty. The domestic enterprises would intensify the ability on self-innovation and on the development of core technology, give top priority to promotion of technology and the protection of proprietary intellectual property rights and strengthen the mass production of high-end electronic information materials.

【Statistical data】

Table 1 Industrial scale situation in electronic materials in 2005

Types	Number of institutes	Number of enterprises	Total number of personnel	Including: technical personnel
Electronic materials	Around 50	Over 1 500	Around 100 000	20000

Table 2 Output, sales volume, export and sales revenue of electronic materials in 2005

Name of products	Unit	Output	Sales	Export	Sales revenue （10,000 yuan）
Polysilicon materials	Ton	80	80		
Silicon single crystal materials	Ton	2700	2700	1886	500000
Germanium single crystal	Ton	10	10	6	8300
Gold bonding wire	Kilogram	7510	7510		

Moulding-powder and accessories	Ton	32213	31699	1014	
Quartz ware	Kilogram	1296789	1282138	882000	
CCL materials	10,000 square meters	20055	20055	139370 tons	1690608
Including: glass-fiber base	10,000 square meters	11275	11160		
Paper base	10,000 square meters	7085	7380		
Compound base	10,000 square meters	1810	1845		
Magnetic materials	Ton	450000	450000		2500000
Including: soft magnetic materials	Ton	160000			
Permanent-magnet material	Ton	290000			
Casting metal materials	Ton	3000			
Electronic optical glass	Kilogram	7721200	7257200	1200	
Electric-vacuum glass	Kilogram	11561860	11464963	4578504	
Electrolytic manganese dioxide powder	Kilogram	38898000	34967000	14597000	
Condenser foil materials	Kilogram	31138779	28636245	169672	

Including: aluminum foil	Kilogram	21553996	21505107	169672	
PET	Kilogram	377969	340544		
Polypropylene membrane	Kilogram	9206814	6790594		
Piezoelectric material	Kilogram	317196	283004	5075	
Including: Lithium niobate single crystal	Kilogram	8701	3775	145	
Lithium tantalite single crystal	Kilogram	60	250		
Synthetic quartz	Kilogram	308435	278979	4930	
Tungsten products	Kilogram	265144	250630	23780	
Including: tungsten filament	Kilogram	41235	41433	480	
Tungsten rod	Kilogram	160145	146471	10750	
Tungsten wire and heating element	Kilogram	17320	16282	250	
Tungsten sheet	Kilogram	46444	46444	12300	
Molybdenum products	Kilogram	261005	250800	2990	
Including: molybdenum wire	Kilogram	75449	70339	840	
Molybdenum rod	Kilogram	88112	82063	1150	
Molybdenum sheet	Kilogram	97445	98398	1000	
Nickel base alloy	Kilogram	698693	660536	850	
Including: nickel wire	Kilogram	50943	44655	850	
Nickel strip	Kilogram	646538	614676		
Nickel pipe	Kilogram	1213	1204		

Composite metal electronic materials	Kilogram	2093131	2077831	11250	
Including: dumet wire	Kilogram	61131	57831	250	
Nickel-plated iron strip	Kilogram	2032000	202000	11000	