



Market Analysis Report: China's Electronics Industry

**Presented to:
Israel Export & International
Cooperation Institute**

APCO
worldwide®

May 2009

Table of Contents

EXECUTIVE SUMMARY	3
1. GENERAL ELECTRONICS OVERVIEW	4
1.1 MARKET OVERVIEW	4
1.2 REGULATORY OVERVIEW	6
2. CONSUMER ELECTRONICS	9
2.1 OVERVIEW	9
2.2 MARKET STRUCTURE AND TRENDS	10
2.3 MARKET CHALLENGES	11
2.4 MARKET OPPORTUNITIES	12
2.5 KEY INDUSTRY EVENTS	13
3. SEMICONDUCTORS	17
3.1 OVERVIEW	17
3.2 MARKET STRUCTURE AND TRENDS	18
3.3 MARKET CHALLENGES	20
3.4 MARKET OPPORTUNITIES	20
3.5 KEY INDUSTRY EVENTS	21
4. FLAT PANEL DISPLAYS	22
4.1 OVERVIEW	22
4.2 MARKET STRUCTURE AND TRENDS	22
4.3 MARKET CHALLENGES	24
4.4 MARKET OPPORTUNITIES	25
4.5 KEY INDUSTRY EVENTS	26
5. PHOTOVOLTAIC PRODUCTS	27
5.1 OVERVIEW	27
5.2 MARKET STRUCTURE AND TRENDS	28
5.3 MARKET CHALLENGES	29
5.4 MARKET OPPORTUNITIES	30
5.5 KEY INDUSTRY EVENTS	31
APPENDIX I: CHINA MAP	32
APCO CONTACT DETAILS	33

EXECUTIVE SUMMARY

- China's electronics industry has played a major role in driving the growth of national GDP. This growth has declined considerably following the global economic slowdown, though double digit growth rates are still projected for 2009.
- Chinese consumers increasingly focus on brands and quality (in addition to price) and Chinese companies are strengthening their capabilities in this respect.
- Outside consumer electronics, the sector is dominated by foreign invested enterprises (FIEs), which are the main owners of much of the core technologies used in production. Israeli firms with technological capabilities can leverage this to forge cooperative partnerships with domestic firms in need of technology transfer.
- Opportunities for Israeli firms in the consumer electronics segment include:
 - Core materials that can be applied in the upgrading of passive components
 - Key component materials and technology focusing on multi-level cell technology research
 - High-end integrated module products
 - Chip components, new electric power components, high frequency components, new lithium ion batteries, new printed circuit boards, components
 - Materials that reduce pollution and enhance environmental protection
 - Field effect transistors, surface effect transistors, LEDs, miniaturized chip resistor-capacitor units, relays/connectors, mini high-frequency-components, high-capacity lithium cells, solar cells and fuel cells.
- Opportunities for Israeli firms in the semiconductor segment exist in the supply of third generation semiconductor materials, system integration of semiconductors, encapsulation and integration for portable electronics, and multimedia IC design in consumer products. Production within China continues to be lead by FIEs, accounting for 60% of market share and 80% of capital investment in the segment.
- Opportunities for Israeli firms in the flat panel display (FPD) segment are especially pronounced in the FPD for TVs segment. The FPD segment in China is still underdeveloped, and has a deficiency in technological capabilities, manufacturing equipment, and raw materials. Demand for FPDs is expected to increase following a government plan to subsidize countryside purchases of electronics, which would include PCs and TVs.
- Opportunities for Israeli firms in the photovoltaic (PV) segment in China include manufacturing equipment for polycrystalline silicon, thin-film and other activities in support of China's push to advance solar power as a source of energy. The PV segment in China was the largest in the world in 2007 and 2008; however, as domestic solar energy demand has yet to take off, the majority of China's output is currently exported.

1. GENERAL ELECTRONICS OVERVIEW

- Growth in China's electronics industry has played a major role in driving the country's GDP growth. However, the economic crisis has slowed development of the industry in recent months, with negative growth rates emerging in November 2008. Despite the recent slowdown, China still projects sales revenue growth rates of 12% in 2009.
- The electronics industry has constituted more than 30% of China's overall trade in recent years. Due to the economic slowdown, however, import growth slowed considerably last year.
- Growth in the industry has been driven by a combination of factors including domestic and international demand, strong government support, and low production costs.
- The Chinese government has taken steps to support certain segments of the electronics industry through policy and regulation, including the integrated circuits (IC) and software segment, the new generation mobile communication segment, next generation internet segment, the digital audiovisual segment, and the PC segment. It also is increasingly paying attention to the environmental impact of the electronics industry.

1.1 MARKET OVERVIEW

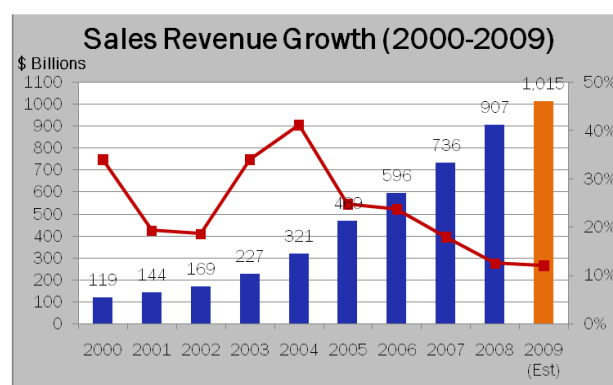
The electronics industry continues to play a major role in China's growing GDP, contributing an average of 10% annually to GDP growth since 2003. It has also maintained extraordinarily high growth rates. From 2001 to 2007, annual sales revenues grew at an average rate of 28%.

Growth rates reached a peak of 41.2% in 2004, but slowed to more sustainable levels in following years. Growth held above 20% for the first half of 2008, but dropped to single digits in the wake of the global economic slowdown in the second half of last year.

The global economic crisis heavily impacted China's electronics industry, which has experienced negative growth since November 2008. In spite of the global crisis, the Ministry of Industry and Information Technology (MIIT) announced recently that it maintains a positive outlook for the electronics industry for 2009, projecting a sales revenue growth of 12%.

Defining China Electronics Industry	
Consumer electronics	Communication devices
Electronic components	Electronic materials
Photoelectric apparatus	Radar devices
Broadcasting/TV industrial devices	Computer devices/peripheral units
Electronic apparatus	Measuring instruments

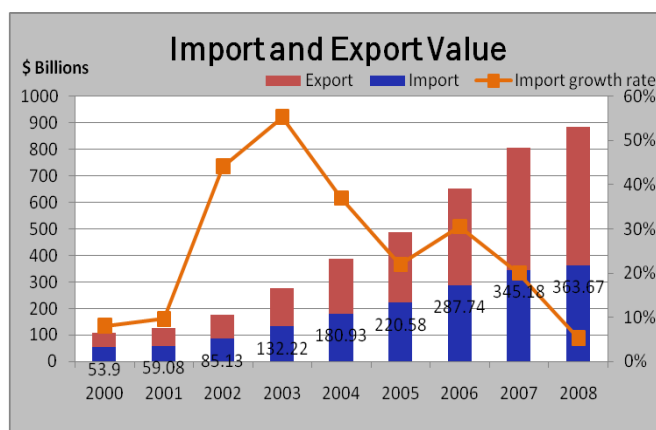
Categorization by MIIT



Source: MIIT annual industrial report

Electronics Trade

Electronics trade has constituted more than 30% of China's overall trade in recent years. Having experienced a spike after China's WTO accession in 2001, import growth gradually has slowed as a result of the booming domestic electronics industry. In 2008, the trade value of electronics comprised 34.6% of national foreign trade, amounting to USD 885.43 billion.



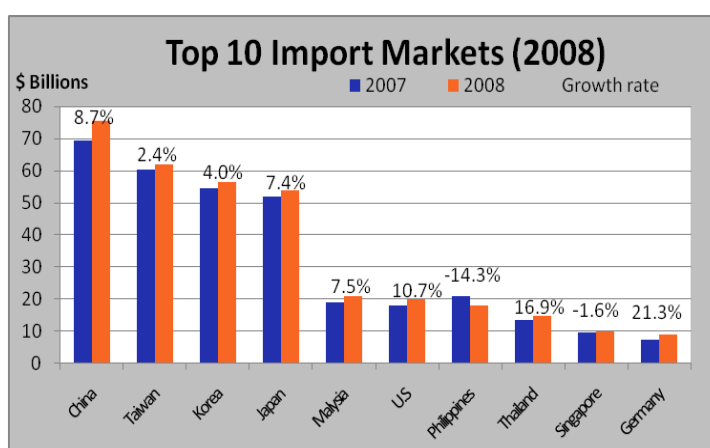
Source: MIIT annual industrial report

As shown in the chart on the right, China's electronics imports were heavily affected by the financial crisis and only increased by 5.36% last year. Starting in November 2008, electronics trade has decreased, with imports during January and February 2009 dropping 36% year-on-year (y-o-y), contributing to a decline in sales revenue of 13.3%. China's foreign electronics trade is likely to remain negatively impacted by the financial crisis in the near future.

Top Five Imported Electronic Products (2008)				Top Five Exported Electronic Products (2008)			
No.	Products	Import Value (USD billions)	Growth (%)	No.	Products	Export Value (USD billions)	Growth (%)
1	IC	129.3	1.20	1	Portable computer	65.6	23.54
2	LCD panel	44.1	8.21	2	Hand phone	38.5	8.27
3	Hard disk driver	12.2	23.64	3	IC	24.3	3.43
4	Printed circuit	11.1	2.74	4	LCD panel	22.4	13.94
5	Accessories of hand phone	9.5	-7.25	5	Accessories of hand phone	18	10.95

The table above indicates that among electronics imports, integrated circuits (IC) are clearly the most popular, while hard disk driver imports saw a remarkable increase in 2008.

Taiwan, Korea, and Japan are the main countries of origin for imported electronics. The chart on the right indicates also that a considerable (and increasing)



Source: MIIT

number of products are being re-imported, often making use of favorable trade taxation policies. The ten countries in the chart together make up 92.5% of China's total import market, amounting to USD 336.34 billion.

While the role of processing trade of imported electronics is gradually declining, it still occupies a significant percentage of China's foreign trade, accounting for 70% of China's total electronics exports. Hong Kong, the US and Japan together receive nearly 50% of China's electronics exports. The export value to the top ten countries and regions (see the chart on the right) accounted for up to 73.4% of overall export value of electronic products, equaling USD 383.02 billion.



Source: MIIT

Industry Drivers

China's electronics industry growth has been driven by a combination of factors that include domestic and international demand, strong government support, and a favorable business climate for attracting foreign investment and technologies.

With rising incomes and improved living conditions especially in China's urban areas, demand for personal computers, mobile phones, LCDs, home appliances, multifunctional chips, and newly emerging electronic technologies such as FPDs has grown rapidly and continues to do so. Likewise, China's inexpensive consumer electronics have attracted increasing demand from abroad.

The government's categorization of electronics as a "strategic industry" has fuelled the surging development of electronics enterprises. By 2010, China will have 30-50 globally competitive State Owned Enterprises (SOEs). In addition, China is currently pushing a four-year strategy of promoting home appliances to the countryside, encouraging cities to establish industrial parks as incubators for electronics enterprises and providing financial aid to research and development (R&D) initiatives.

1.2 REGULATORY OVERVIEW

This section outlines several key policy documents issued by the Chinese government in an attempt to develop the country's electronics industry.

National 11th Five-Year Plan for Advanced Technology Development (2006-2010)

This important industrial planning document mentions the electronics industry as one of eight advanced technology industries to be developed from 2006 to 2010.¹

¹ Other industries include biology, aviation and spaceflight, new materials, advanced technology services, and new energy.

It notes that the focus of development should be on indigenous innovation, technology application, industry clustering, and international cooperation. More specifically, nine national projects will be developed over the course of the 11th five-year plan, which include special projects for the IC and software segment, the new generation mobile communication segment, next generation internet segment, and the digital audiovisual segment, among others. To learn more about specific details regarding implementation (e.g. subsidies, tax incentives) and concrete business opportunities arising out of such national projects, Israeli firms may wish to engage with provincial and municipal level government bureaus with responsibilities for science & technology and/or the electronics sector.

Administration Measures on Pollution Control for Electronic Information Products

The measures apply to electronics manufactured/distributed in and imported into mainland China. Because of similarities with the European “Restriction of Hazardous Substances” Directive (RoHS), the measures are often referred to as the “Chinese RoHS.” According to the measures, electronics manufacturers should reduce or eliminate the use of hazardous materials through design/materials changes, technical adjustments and upgrading of processing methods. As hazardous materials should be clearly indicated when products are distributed or imported, Israeli exporters should be aware of the technical specificities outlined in these measures.

Stimulus Plan for Electronics and Information Industry

This plan spans 2009-2011 and aims to maintain and upgrade the development of China’s electronics industry. The plan outlines three major tasks for industry adjustment and growth:

- Strengthen the competitiveness of China’s PC segment, accelerate product upgrades for electronics components and equipment, and push forward the digitization of audiovisual products.
- Establish an independent IC industry system and advance new display segment technology and indigenous innovation in the software segment.
- Grow the area of communication devices, information services and information technology application.

IPR Issues in China

While the protection of intellectual property rights (IPR) remains a contentious issue for companies in China, the country’s laws and regulations have progressed considerably in recent years, with the large majority now being compliant with the requirements of the WTO’s TRIPS agreement.

The main challenge surrounding IPR protection in China regards the lack of effective enforcement of the regulations. Enforcement issues arise from a range of root causes, including the relatively recent introduction of IPR legislation and concept of intellectual property in general, the absence of a fully independent judicial system, and provincial officials’ often protective attitude towards local, job creating counterfeiting industries.

While most foreign companies considering business operations in China may have to accept an unavoidable degree of IPR infringement, there are nevertheless a number of actions that a company can take in order to limit their IPR-related risk:

- Ensure to register your patents, copyrights, or trademarks with the relevant bureaus
- Ensure that your trade or other business agreements include clauses to protect your IPR
- Sign contracts or confidentiality agreements with staff that has access to key technologies and make sure that your policies on trade secrets and other relevant issues are properly communicated
- Be aware of China’s (often quickly changing) laws and regulations, and understand the different possible ways of redress, including administrative and judicial channels.

The plan provides for the immediate launch of key projects that will enhance the level of technology and productivity of the IC segment (see chapter four), upgrade the FPD segment and transform the color TV segment (see chapter five), and develop the application of digital TV and its industry chain.

The stimulus plan also includes fiscal measures and taxation policies (due to the recent issuance of the plan, further details were not yet publicly available at the time of writing) and an investment of USD 86.35 billion into the development of 3G mobile communication networks and next-generation internet and digital TV networks. Furthermore, specific electronics products have been subjected to increased export tax rebates. Such products include tricolor and glass-type tubes, mono-crystalline silicon sticks, mono-crystalline silicon chips, copper-clad laminate and picture tube bulbs.

2. CONSUMER ELECTRONICS

- While China's sales growth rates for consumer electronics have remained high, the segment has been heavily affected by the global economic slowdown.
- Chinese consumers increasingly focus on brands and quality (in addition to price) and Chinese companies are strengthening their capabilities in this respect.
- Cost-related pressures caused by global competition have transferred digital product manufacturing to China, which has now become the world's most important production base for MP3 players and MP4 players with DC/DV. Digital video and mobile storage have especially maintained rapid development in 2008.
- Opportunities for Israeli firms exist particularly in the following areas:
 - Core materials that can be applied in the upgrading of passive components
 - Key component materials and technology (mainly focusing on multi-level cell (MLC) technology research
 - High-end integrated module products
 - Chip components, new electric power components, high frequency components, new lithium ion batteries, and new printed circuit boards.
 - Components and materials that reduce pollution and enhance environmental protection
 - Field effect transistors (FETs), surface effect transistors, LEDs, miniaturized chip resistor-capacitor units, relays/connectors, mini high-frequency components, high-capacity lithium cells, solar cells, and fuel cells.

2.1 OVERVIEW

Technology developments in the household, portable and automotive consumer electronics segments have driven the rapid development of China's overall consumer electronics market and are expected to continue to do so in the coming years.

China's enormous consumer electronics industry accounted for approximately 30% of total global output in 2007. In the first three quarters of 2008, the segment maintained steady growth, with the domestic market totaling USD 81.44 billion in the period January-October, a 16% increase over the previous year.

While the consumer electronics market has been hit hard by the economic downturn, the outlook for the consumer electronics market is still largely positive. Overall, demand is expected to continue to rise, which will boost not only volume but also revenues as consumers are able to afford increasingly sophisticated products. Smaller household appliances (e.g. kitchen hoods, electric heaters,

Domestic Sales of Main Household Electronics		
Product	Units	Growth (yoy)
Digital entertainment products (including MP3s, MP4s and other entertainment handsets)	5.69 million	-35%
Laptops	12.6 million	48%
TV sets	35.66 million	0.2%
Mobile phones	147.36 million	-1.2%
Digital cameras	9.23 million	8.0%

electromagnetic ovens, air liquidifiers) are growing particularly fast, with sales revenues contributing over 20% to total consumer electronics sales.

Consumer electronics imports in 2008 totaled USD 47.844 billion, up 6.05% from 2007.

China's Main Consumer Electronics Components Imports

- Digital video camera components
- Camera components
- TV components
- Displacement pumps
- Bearings and valves
- Air conditioner and refrigerator valves

Source: MIIT

2.2 MARKET STRUCTURE AND TRENDS

Cost-related pressures caused by global competition have transferred digital product manufacturing to China, which has now become the world's most important production base for MP3 players and MP4 players with DC/DV. The release of DTV ground transmission standards, the gradual expansion of IPTV license issuances in pilot cities, and the application and rapid development of mobile GPS navigation have served as new drivers behind China's consumer electronics industry.

Brands and Quality Replace Price Competition as New Battleground

Chinese Consumers have increasingly based their consumer electronic purchasing decisions on quality and brand names, in addition to price. There is an increasing amount of information on websites, in the media and product advertising, which consumers now turn to for purchasing decisions. Consequently, new and innovative products have become one of the most important success factors for the Chinese consumer electronics market in recent years.

Continuous Rise of Domestic Brands

More domestic manufacturers and brands have been appearing in the market. These brands offer good-quality products at competitive prices and have increased consumer confidence in domestically produced consumer electronics. Domestic manufacturers have spent substantial time and money on research and design of new products, aiming to incorporate the latest

Flagship Companies Consumer Electronics

Haier

Founded in 1984, a leading private owned consumer electronics group in China and the world.

- HQ in Qingdao, Shandong province
- The fourth biggest white household appliance manufacturers in the world and top in China
- Has over 240 branches, and has set up design centers, manufacturing bases and trading companies in more than 30 countries in the world, with staff over 50,000 internationally
- Sales revenue in 2008 reached USD 4.37 billion
- Market share in China ranks first, reaching over 25.5%
- Has world leading class technologies in smart household appliance IC, digital electronics, large-size circuits and new materials
- Has a Global Operation (GO) to manage global sourcing and logistics. Purchasing network covers the entire globe while China is the biggest procurement center. Online open bidding for procurement in China is accessible at: www.haierbid.com.

trends. At the lower end of the market, competition among homogeneous product manufacturers still centers on price. This is most notable in mp3 players, mobile phones and digital cameras.

Geographic Clustering

Most of China's consumer electronics enterprises are located in the Pearl River Delta (PRD) in Guangdong province and, to a lesser extent, in the Yangtze River Delta (YRD), centered around the Shanghai region, and the Bohai-Rim, centered around the wider Beijing region.

2.3 MARKET CHALLENGES

In recent years, China's consumer electronics industry has been increasingly in need of reform, which has been exacerbated by the global economic crisis.

Factors such as an over-emphasis on mid and low-end products, shrinking profit margins, and rising production costs have contributed to the necessity of an overall industry upgrade for the consumer electronics segment.

Technological Shortcomings and a Lack of R&D Capabilities

While China's major domestic consumer electronics firms (e.g. Haier, Hisense, Midea) are very strong in general electronics such as color TVs, washing machines, and refrigerators, the majority of core technologies for more advanced electronics remains the property of international firms in China. Japanese, US and European multinationals dominate in the high-end segment of the consumer electronics industry; Korean and Taiwanese companies operate in the mid-end segments. While the major domestic players are improving at a considerable pace, Chinese companies are overall still focusing on mid-to-low end technologies and electronics. As a consequence, high-end and technologically advanced electronic components and component materials need to be imported from abroad.

Innovative areas where China competitors for Israeli consumer electronic component firms are making gradual headway include energy and materials-saving, or "green" production of consumer electronic components. Japan's TDK China has projected increasing demand for its environmental protection

Flagship Companies Consumer Electronics

Hisense Group Corporation

Founded in 1969, Hisense is a large-scale state owned electronic information company. The sales revenue of it reached USD 7.04 billion in 2008.

- After the successful acquisition of Kelon Corporation, Hisense has two publicly-traded companies: Hisense Electric and Kelon Electric
- Its products and services span six industries: multi-media, home appliances, communications, IT, real estate, and services (and facilities), with products including TVs, refrigeration, air-conditioners and mobile phones.
- Hisense has a global R&D system, with R&D centers located in Qingdao, Beijing, Shenzhen, Shunde, South Africa, USA, and the Netherlands.
- It has 13 production bases in China and production bases in South Africa, Hungary, and Egypt and subsidiaries in the USA, Europe, Australia, North Africa, and Japan.
- Its products are exported to over 100 countries and regions throughout the world.
- The company has already set up cooperation with Whirlpool and AMD most recently.
- In 2009 the company will further develop two liquid crystal module product lines and expand production capacity to 3 million units.
- April 2, AMD and Hisense founded a Joint Design Center with the mission of optimizing software and hardware design of digital home products and designing high-end products, such as embedded flat panel TVs, smart phones and cash registers.

electronic components, such as Nd magnets for air-conditioner inverters, DC/DC transducers for HEV, lithium ion batteries, high-performance ferrite magnets, and ferrite cores to power higher efficiency electric power and power transformers.

2.4 MARKET OPPORTUNITIES

R&D Focus and Opportunities for Sino-Israeli Cooperation

Opportunities for Israeli consumer electronic component firms particularly exist in the three main areas:

- 3G Telecom – 2008 the Chinese government issued 3G license to China's three main telecom operators. This is expected to lead to a huge increase in demand for 3G and 2G/3G compatible handsets as the 3G networks get up and running.
- Digital TV – High-definition digital TV programming has arrived in China, with an investment of USD 360 million into digital TV networks

Further Areas with Opportunities for Israeli Companies

The following are areas and technologies where China is still dependent on foreign companies and where there are further opportunities for Sino-foreign cooperation:

- Technological cooperation
 - Participation at the early stage of Chinese industry standards setting
 - Technology development for next generation products
 - Monitoring technology development and demographical trend in China
- R&D
 - Cooperation with central research institutes with giant consumer electronics firms
- Direct sales
 - Penetrate into existing supply chain by attending procurement tendering
 - Position Israeli companies as global leaders of technology

Governmental Stimulus Plan

The stimulus plan for the electronics industry (see chapter 1.2) calls for an upgrade of China's electronic components through international cooperation and further development of R&D and manufacturing capabilities in the areas of chip components, new electric power components, high frequency components, new lithium ion batteries, and new printed circuit boards. It also calls for developing electronic components and key materials that reduce pollution and enhance environmental protection.

With the aim of promoting technology transfer, China has also announced that it will provide financial support to specific electronic components segments, including field effect transistors (FETs), surface effect transistors, LEDs, miniaturized chip resistor-capacitor units, relays/connectors, mini high-frequency components, high-capacity lithium cells, solar cells, and fuel cells.

In addition, the Chinese government is planning new stimuli to boost domestic consumption.

2.5 KEY INDUSTRY EVENTS

China International Consumer Electronics Show (SINOCES)
Qingdao International Exhibition Center, Shandong Province
July 9-12, 2009

In July, IEICI will lead an Israeli trade delegation to SINOCES, the most influential consuming electronic exhibition in the Asia-Pacific region. SINOCES 2009 is expected to have more than 450 exhibitors and at least 70,000 visitors.

Exhibit categories include household visual products, digital entertainment products, household appliance, portable office equipment, storage solving solutions, mobile communication solutions, security products, and automotive electronics, etc. The exhibition also has set show rooms for specific topics, such as industrial design, environmental-protection products, security, 3G communication, electronic business, and digital family. SINOCES will also hold conferences and forums discussing of the green developing trend of consuming electronics, next-generation display technology, network application, 3G communication and others.

Website: <http://www.sinoces.com/en/index.aspx>

China Electronics Fair (CEF)
Chengdu Century City New International Exhibition Center
August 27-29, 2009

Shanghai New International Exhibition Center
November 11-13, 2009

China Electronics Fair (CEF) is one of the five big electronics Exhibitions in Asia. CEF holds three exhibitions every year, one each in the spring, summer and fall. The spring exhibition held in Shenzhen ended on April 11, 2009, the summer exhibition will be held in Chengdu in western China, and the fall exhibition will be held in Shanghai.

The Chengdu exhibition will host approximately 500 exhibitors and more than 10,000 visitors, with an exhibition floor of more than 10,000 square meters. Exhibit categories include electronic components, electronic materials, manufacturing equipment, and testing, measurement apparatus, and others.

Flagship Companies Consumer Electronics

Skyworth Digital Holdings Limited
Established in 1988, Skyworth Group is a leading manufacturer of TV, electronic and telecom products in China. The company is ranked as one of the top three TV manufacturers in the Chinese TV industry.

- Produces plasma and LCD TVs, digital high-definition projection TVs, Digital TV top sets, AV products, security and protection products, small home electric appliances, auto electronic products and telecom products.
- 83.6% of USD 946 million in revenue in 2008 came from mainland China.
- Sales of TV products and digital TV set-top box accounts for 89.3% and 8.6% respectively.
- Headquartered in Shenzhen, the company has manufacture and R&D center in Shenzhen, and a marketing center in Guangdong.
- It has strong distribution network, and establishes 40 branches, 176 offices, and more than 10,000 distributors in China
- Skyworth's procurement department is located in Shenzhen.

The Shanghai exhibition is projected to host about 1,800 exhibitors and more than 60,000 visitors from China and abroad, with an exhibition floor of over 60,000 square meters. Exhibit categories include consumer electronics, green lighting products, new display technology, security electronics, automotive electronics, energy-saving technology, environmental protection technology, and others.

Website: www.icef.com.cn

2009 International Electronic Equipments, Components, Photonics and Laser (China) Exhibition Shenzhen Convention & Exhibition Center June 19-21, 2009

Organized by Chinese Institute of Electronics (CIE), this exhibition has been held for 16 years, with the 17th annual exhibition in 2009. In the 2008 exhibition, more than 900 exhibitors participated with more than 3,000 booths and an exhibition floor of more than 50,000 square meters. 200 of the world's top 500 enterprises visited the exhibition and purchasers.

Exhibit categories include electronic equipment for production, processing, shaping, maintenance assembling, PCB, SMT, semiconductor processing fixtures, as well as electronic components such as capacitor, resistance, potentiometer, inductor, winding, magnetic materials and parts, printed plate board, and more.

Website: <http://en.e99999.com/exhibition/77.htm>

**Flagship Companies
Consumer Electronics**

Midea Group

Originally established as a state-owned company in 1968, Midea transformed into a private business in 2001. It is now one of the largest listed white household appliance production and export companies in China.

- Core products include a wide range of white household appliances as well as other supporting products, such as compressors, electric motors, magnetrons and transformers.
- At the 2008 Guangzhou Trade Fair, Midea exhibited a number of new products, including a variable-frequency air-conditioner, an air powered water heater, a smart electric cooker, and a steam microwave oven.
- In 2007, sales revenue increased by 30%, hitting a record of USD 9.86 billion, while export sales increased by 40% to USD 3.12 billion. Negatively impacted by the economic slowdown, 2008 sales revenues dropped sharply to RMB USD 6.83 billion.
- In addition to its headquarters in Shunde, the Group has established production bases in Guangzhou, Zhongshan, Wuhu, Wuhan, Huai'an, Kunming, Changsha, Hefei, Chongqing, Suzhou and others.
- Its marketing network covers all of China, and it has branches in the United States, Germany, Japan, Hong Kong, South Korea, Canada and Russia. Its products are sold in more than 100 countries.
- Midea's main domestic and foreign partners are Toshiba, Sanyo, Shibaura, General Motor, Electrolux and the Merloni.
- Midea has a group procurement center in Foshan, Guangdong province, established in 2003 and responsible for bulk raw materials procurement and foreign trade.

Flagship Companies Consumer Electronics

Konka

Founded in 1980, a Chinese foreign joint venture company focusing on the manufacture of color TVs and other consumer electronics

- HQ in Shenzhen, Guangdong province.
- Produces color TV sets, mobiles, white household appliances, LED, TV top-boxes and related components.
- Has over 50 sales branches, several hundred sales office and over 3,000 after-services centers in China.
- Products sold in China and more than 100 countries and regions. Sales revenue in 2008 reached USD 1.76 billion, growing 0.3% annually.
- Best seller of color TVs in China in recent years, covering CRT TVs, flat panel display TVs, digital TVs and projection TVs, with annual productivity of over 12 million sets.
- One of the top three sellers of mobiles (GSM and CDMA) among domestic brands, with annual productivity of 4 million sets.
- Has 6 manufacturing bases in different provinces of China, and product processing manufacturing enterprises in Thailand, India, Mexico, Turkey, EU and the US.
- Recently focused on LED R&D and production, and seeking opportunities for cooperation in its upper stream industry.

Flagship Companies Consumer Electronics

TCL

Established in 1981, TCL is one of the largest state owned consumer electronics enterprises in China. Under the group are three listed companies: TCL Corporation, TCL Multimedia Technology and TCL Communication Technology. In 2008, it recorded more than USD 5.4 billion in sales.

- The company has five product lines: color TV, Audio & video, Communication, home appliances and digital products.
- Multimedia business and home appliances account for 61.37% and 35.56% of sales respectively
- 55.38% of sales are to domestic customers, 44.62% go to the overseas market.
- Headquartered in Huizhou, Guangdong province, the company has a sales and marketing network throughout China and abroad.
- Has over 20 manufacturing and processing plants located in China, Poland, Mexico, Thailand and Vietnam.
- In 2009, it will further put innovative R&D as the first priority, with focus on flat panel display technology and 3G technology.
- TCL has an internal electronic procurement and bidding system.

Flagship Companies Consumer Electronics

Changhong

Established in 1958, it is now one of the largest Chinese consumer electronics provider specializing in R&D, manufacturing and marketing of consumer electronics products.

- Changhong became a publicly traded company with shares listed on the Shanghai Stock Exchange in 1994.
- It has established overseas branches and representative offices in the US, Europe, Australia and Russia. In addition, it has more than 20,000 sales and service outlets worldwide.
- Changhong's activities include digital TVs, air conditioners, refrigerators, IT, communication, digital, networks, electrical power sources, commercial electronics and petty appliance.
- Changhong has partners to develop global markets which can be distributorship, agency etc for its brand.
- Changhong has established joint laboratories with Toshiba, Sanyo, GE, Microsoft, TI, Samsung, LG, and Philips. The company has also established R&D centers in Shanghai and Shenzhen in China, American Silicon Valley, and Japan.
- Changhong has four R&D and manufacturing bases located in Mianyang, Zhongshan, Nantong, and Changchun in China.

Flagship Companies Consumer Electronics

Huaqi Information Digital Technology Co., Ltd (Aigo)

Established in 1993, Aigo supplies electronic products for consumer and professional markets.

- Products include portable storage devices, MP3 players, MP4 players, MP5 players, digital cameras, Mobile Internet Device (MID), solar chargers, digital photo frame, digital microscope, etc.
- Aigo recorded consolidated annual sales of approximately USD 294 million in 2008.
- Currently, the revenue of overseas businesses covers 20% of its total revenue.
- Aigo has established 6 R&D institutions in Beijing, Shanghai and Shenzhen.
- Aigo has set up overseas branches in Hong Kong, Singapore, India, France and USA.
- Aigo is a sponsor of the 2008 Beijing Olympics, Formula 1 and ROC.
- Most recently, Aigo has established cooperation with German electronics company HAMA in terms of the 2009 European market entry strategy.
- Aigo started the R&D of 3G mobile phones in April 2008 and will launch 7 products in June 2009.
- Aigo is in the R&D of TD mobile phones and aims to integrate mobile phone technology and television technology of CMMB.

Flagship Companies Consumer Electronics

Lenovo Group

Formerly known as "Legend", Lenovo was established in 1981 and listed in 1994 in Hongkong. Now headquartered in Raleigh, USA, Lenovo's sales revenue of 2008 is recorded as USD 16.35billion, with USD 94 million loss in Q4.

- Lenovo's product lines include laptops, desktops, servers, storage devices, computer peripherals, digital products, mobile phones, etc.
- Lenovo acquired IBM's PC business in 2005.
- In 2007, Lenovo had a market share of 35.2% in China's PC market.
- Among the 2008 revenue, 37% came from Great China, 28% from Americas, 22% from Europe, the Middle East and Africa, and 13% from non-China Asia Pacific region.
- Lenovo has branches in 66 countries and conducts business in 166 countries.
- Lenovo's global R&D centers are based in Beijing, Tokyo and Raleigh.
- Lenovo aims to launch 20 types of laptops and 24 types of desktops, including the robust netbooks, in 2009.
- Recently, Lenovo has established cooperation with China Mobile, China Unicom and China Telecom to tackle opportunities derived from the 3G developments in China.

Consumer Electronic Components Firms in China: Competition for Israeli Firms?

China's consumer electronics component industry is mainly driven by FIEs, which contribute to approx. 80% of total industrial revenue. Partly because of their larger exposure to western markets, the economic downturn has had a greater impact on the FIEs than on the domestic firms. FIEs' revenues fell 8.9% in the second half year of 2008, the domestic firms dropped only 3.8%.

China's main products include basic electronic components such as capacitors, resistors, magnetic materials, inductors, transformers, filters, antennae, electronic transformers, quartz crystal units, micro-electronic machines, electronic adapters and printed circuits. Electronic components based on multilayer ceramic (MLC) and low-temperature co-fired ceramic (LTCC) are also examples of mainstream products. Furthermore, China produces 46% of the world's electric acoustic devices, and 70% of the world's micro-electronic machines.

TDK China CO., Ltd.

TDK China is a subsidiary of TDK Corporation in Japan, it started its business in China in 1989 and may be a competitor for many Israeli consumer electronics components firms.

- HQ in Shanghai and 10 manufacturing branches in East and South China
- 70,000 staff on the Mainland.
- Produces consumer electronic components for IT, home appliances, cell phones, computers, DVD/HDD recorders, flat panel displays, etc.
- Aims to expand business in transformers, transducers, modules and displays.

3. SEMICONDUCTORS

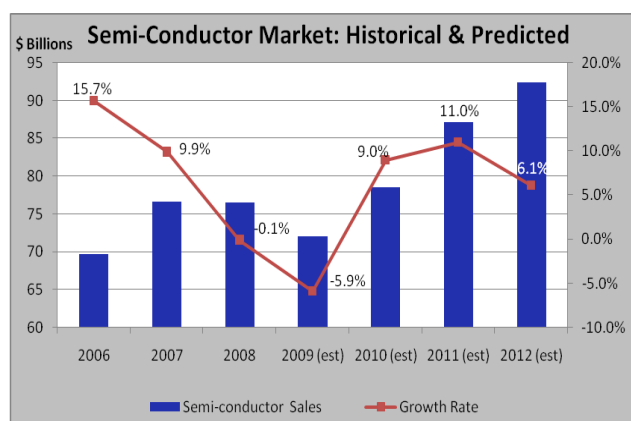
- China's IC enterprises are not able to meet the country's immense domestic demand: approximately 80% of chips used domestically are currently imported.
- China's IC segment has companies operating in almost every stage of the supply chain, but remains weak in operations that require high levels of technological capability, instead excelling at IC assembly and testing, which has low technological barriers to entry.
- 60% of market share and 80% of capital investment in the semiconductor industry is attributable to FIEs, as domestic companies are in the nascent stages of development.
- Technological shortcomings limit the development of the industry. Nearly 90% of Chinese semiconductor manufacturing equipment is imported.
- Israeli firms that excel in semiconductor design, R&D and manufacturing are good companies to try and target the Chinese semiconductor market. Israeli firms that specialize in equipment for IC assembly and testing may face a higher degree of competition, due to China's strong capabilities in this segment.
- Other opportunities for Israeli firms exist in the supply of third generation semiconductor materials, system integration of semiconductors, encapsulation and integration for portable electronics, and multimedia IC design in consumer products.

3.1 OVERVIEW

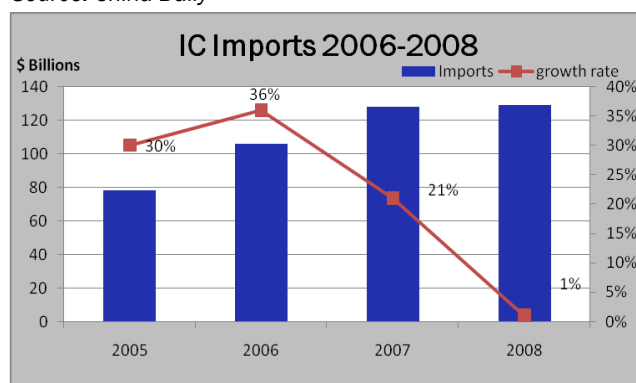
China's semiconductor market reached USD 76.5 billion in 2008, but is expected to shrink 5.9% in 2009, the first major setback for the segment. Semi-conductor demand is expected to rebound in following years, however, continuing the trend of strong growth witnessed in recent years.

China's vast chip market nearly makes up a third of total global demand. However, domestic IC enterprises have only been able to satisfy around 20% of the country's domestic demand, leaving the other 80% up to imports.²

From 2002 to 2007, China's IC industry grew at an average annual rate of 37.5%. It nevertheless slowed to single digit growth in 2008 as a result of the economic crisis and slowing demand. Similarly, import growth numbers were over 20% up to 2007, but fell prey to the economic crisis in 2008.



Source: China Daily

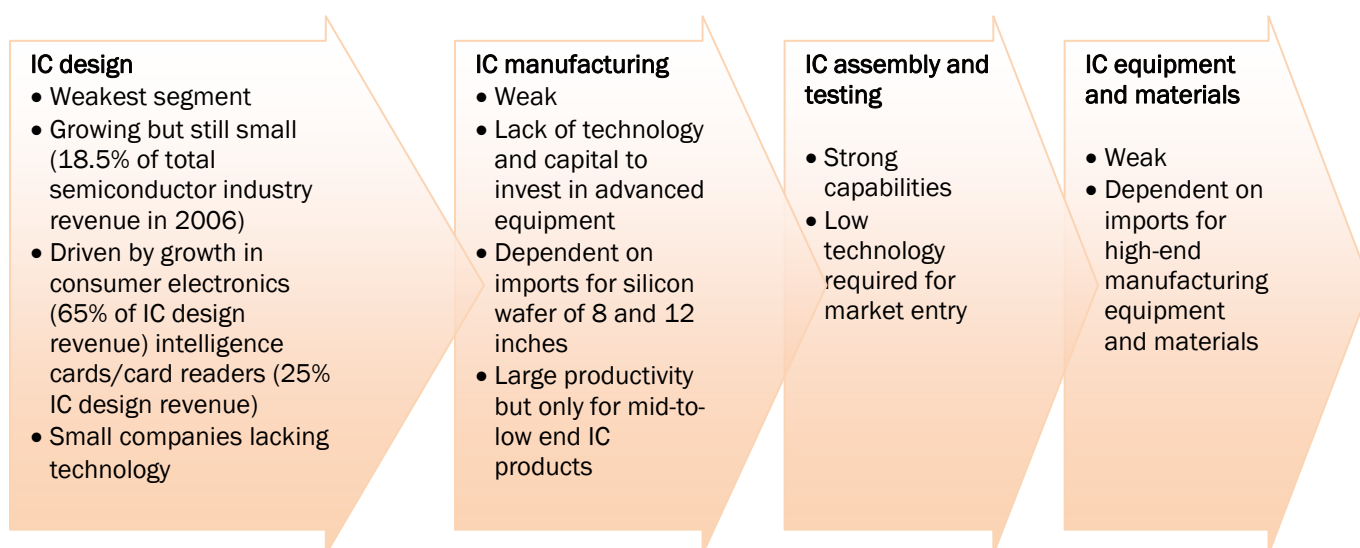
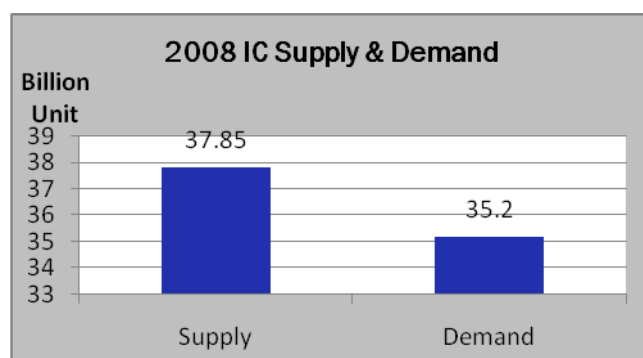


Source: MIIT Industrial Annual Report

² However, a considerable number of imported products are re-imported, e.g. due to favorable trade policies.

3.2 MARKET STRUCTURE AND TRENDS

Over 90% of China's semiconductor industry is involved in the production of IC. While within the IC segment, China has companies operating in most every link of the supply chain, companies' capabilities vary considerably (see the flow chart below). The large majority of domestic manufacturers are engaged in IC assembly and testing. In recent years, IC assembling and testing for quad flat packages (QFP) and low-profile quad flat packages (LQFP) has



experienced increasing demand.

Geographic Clustering

China's semiconductor industry is based in coastal regions such as the YRD and the PRD with high-technology semiconductor enterprises assembled in developed cities such as Beijing, Tianjin, Shenzhen, Wuxi (Jiangsu Province) and Suzhou. In addition, big cities in inland areas such as Chongqing and Xi'an are gradually developing large industrial parks for the semiconductor industry.

Competitive Landscape

FIEs play a dominant role in China's semiconductor industry, with 60% market share and contributing more than 80% of the capital investment in the industry. 10% of China's IC design companies, 38% of its foundries, and 85% of the IC assembling and testing companies are FIEs. China's domestic companies are overall still in nascent stages of development. The tables below list the main domestic players in three segments of China's semiconductor industry.

Top 10 IC Design Enterprises (2008)		
Enterprise	Location	Sales '08 (USD mln)
Shenzhen Hisilicon	Shenzhen	445.3
China Integrated Circuit (CIDC)	Beijing	207.7
Datang Microelectronics Technology	Beijing	120.3
Hangzhou Silan Microelectronics Co., Ltd	Hangzhou	116.9
Actions Semiconductor Co., Ltd	Zhuhai	97.6
Wuxi China Resources Semico Co., Ltd	Wuxi	89.8
Beijing Vimicro Corporation	Beijing	89.5
Shanghai Huahong Integrated Circuit Co., Ltd	Shanghai	88.4
Beijing Tongfang Microelectronics Co.	Beijing	57.1
NEC Electronics China	Beijing	40.6

Top 10 Chip Manufacture Enterprises (2008)		
Enterprise	Headquarters	Sales '08 (USD mln)
Hynix-ST Semiconductor	Wuxi	1,756.7
Semiconductor Manuf. International Corp.	Shanghai	1338.8
Shanghai Huahong Group	Shanghai	673.4
China Resources Microelectronics Limited	Wuxi	654.1
Grace Semiconductor Manuf. Corp.	Shanghai	208.1
Shongang NEC Electronics	Beijing	206.5
Hejian Technology Co., Ltd	Suzhou	192.8
TSMC (Shanghai) Co., Ltd	Shanghai	158.3
Sino-Microelectronics	Jilin	150.8
Advanced Semiconductor Manuf.	Shanghai	134.3

Top 10 Assembling & Testing Enterprises (2008)		
Enterprise	Location	Sales '08 (USD mln)
Freescale Semiconductor China	Tianjin	1,670.5
Qimonda AG Technology Company	Xi'an	1236.9
RF Micro Devices, Inc	Beijing	647.7
Jiangsu Xinchao Technology Group	Jiangyin	573.9
Panasonic Semiconductor	Shanghai	562.3
Shenzhen STS Microelectronics	Shenzhen	510.9
Renesas Technology	Beijing	414.9
Nanjing Fujitsu Microelectronics	Nanjing	958.4
Infineon Technology (Wuxi) Co., Ltd	Wuxi	333.7
Samsung (Suzhou) Semiconductor Co., Ltd	Suzhou	315.2

Source: China Semiconductor Industry Association

The economic crisis has heavily impacted the whole industrial chain of China's semiconductor industry, especially for IC manufacturing and design. Large foundries like Taiwan Semiconductor Manufacturing Company (TSMC) and Semiconductor

Manufacturing International Corp. (SMIC) have recorded low utility of their production lines and a range of small-sized IC design enterprises have had to shut down.

Furthermore, due to declining market demand and downward pressure on chip prices, semiconductor companies in China have been more interested in partnerships in order to minimize the effects of the crisis. From small domestic IC design companies to large FIEs involved in IC assembly and testing, companies across the board have initiated consolidation efforts or established partnerships with competitors.

3.3 MARKET CHALLENGES

Lack of Technological Expertise

The lack of technological expertise has been a main reason why China's semiconductor industry development is still in its infancy. It has limited the industry's R&D capabilities, forced the industry to depend on acquisition of foreign technology, and has hindered China's development of high-end semiconductors.

Lack of Advanced Manufacturing Equipment

Nearly 90% of Chinese semiconductor manufacturing equipment is imported, mainly from the U.S., E.U. and Japan. Though domestic enterprises have made progress in equipment development in recent years, China is still far behind western and Japanese standards, especially for high-end equipment. Taiwan's TSMC has aggressively promoted domestic production of semiconductor manufacturing equipment, aiming to produce 50% of its equipment for IC manufacturing domestically by 2009.

3.4 MARKET OPPORTUNITIES

3G Telecom

Last year's issuance of China's long-awaited 3G licenses has resulted in ample opportunities for communication-related IC businesses and will continue to do so. Taiwan's MEDIATEK has launched a TD-RF single chip that can advance the performance of TD-HSDPA and TD-HSUPA technologies. Also, single chips with integrated functions of WLAN, GPS and FM have been developed by a variety of companies.

Flagship Companies Semiconductors

Semiconductor Manufacturing International Corporation (SMIC)

Founded in 2000, SMIC, a Sino-foreign JV, is the biggest IC Foundry enterprise with the most advanced technology among domestic firms in China, and has become a leading global IC Foundry enterprises

- HQ in Shanghai with 8 factories producing 200mm & 300mm-chips located in Shanghai, Beijing, Tianjin and Shenzhen.
- 9,000 employees.
- Main foundry for the top-5 IC chip suppliers in the world.
- In cooperation with Dolphin Company (U.S.) to develop digital analogue converters, and FlipChip International (FCI) to develop new-generation 300mm flip chips and foundry packaging.

Shenzhen Hisilicon Semiconductor Co.

Founded in 2004, Hisilicon is owned by Huawei, and has its HQ in Shenzhen. Hisilicon has set up design divisions in Beijing, Shanghai, Silicon Valley and Sweden.

- 1,200 employees.
- Sales revenue ranked top among domestic IC design companies in 2007 and 2008.
- Focuses on chip solutions in the three fields: communication networks, wireless terminals and digital media.
- Developed more than 100 chips, with 500 patents. Products distributed to 60 countries.

Digital TV Set-Top Boxes

China's decision to invest USD 360 million into digital TV networks has severely stimulated the country's digital TV market and provided ample opportunities for semiconductor enterprises at home and abroad. FUJISU is one of the companies that have taken immediate action, developing JAVACDC, a virtual system that can be applied to the mainstream chip in the set-top boxes.

Further Opportunities/Technologies in Increasing Demand

- Third generation semiconductor materials (including transistors, photon crystals, SiC, GaN, and ZnSe).
- System integration of semiconductors, replacing the existing separate chips.
- Encapsulation and integration for portable electronics.
- Multimedia IC design in consumer products, in line with the trend to integrate computer, telecommunication and electronic consumer products.

3.5 KEY INDUSTRY EVENTS

China (Wuxi) International Semiconductor and FPD Industry Expo (CSF)

Wuxi Exhibition Center, Jiangsu province

October 29 – November 1, 2009

Organized by the National Development and Reform Commission, CSF was first held in 2006 in Wuxi, Jiangsu, located in the Yangzi River Delta, home to the majority of China's leaders in electronic industry. The 2008 CSF attracted over 150 enterprises from China and abroad, and over 50,000 visitors.

Exhibit categories include IC design products, semiconductor equipment and parts, IC application solution, semiconductor materials, assembling and testing products, and FPD and PV products.

www.wxcsf.org

SEMICON China 2010

Shanghai New International Exhibition Center

March 16 – 18, 2010

Organized by SEMI, a non-governmental international industrial association, SEMICON China is the biggest event in Chinese semiconductor industry first held in 1988. Just completed in March, the 2009 SEMICON China hosted 891 exhibitors and 35,000 visitors, with an exhibition floor of 57,500 square meters. During the exhibition, it also held several seminars and technology forums, such as the ISTC/CSTIC 2009, as well as the 5th CSPV that attracted about 1,000 professionals.

Exhibit categories include IC products, FPD, MEMS, PV and other related products and technology.

http://semiconchina.semi.org/scchina2008-en/ProgramsEvents/CTR_012200

4. FLAT PANEL DISPLAYS

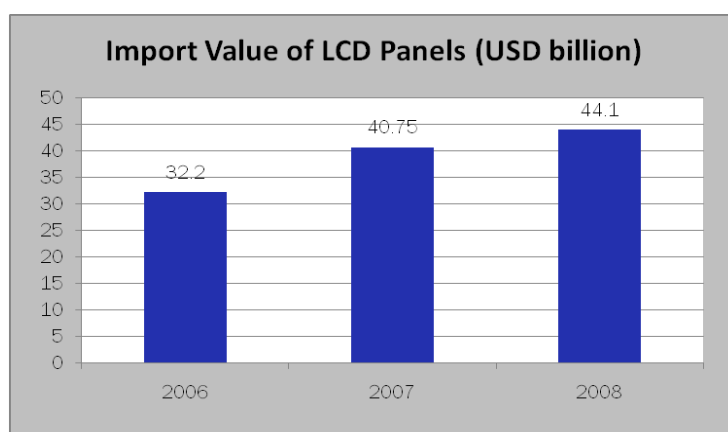
- China's flat panel display industry is still in the early stages of development, due to a relative lack of scale, R&D capabilities, capital, and integrated supply chain that is typically required in this industry.
- The most developed segment in the industry is the TFT-LCD segment; the PDP and OLED segments have yet to reach as mature a stage as TFT-LCD. Current R&D efforts are focused on the undeveloped two segments, with plans to open up production lines in the near future.
- In addition to technological shortcomings, another obstacle to the development of the industry is a lack of access to manufacturing equipment and raw materials required for the production process. A lack of scale also currently limits the industry's development.
- Israeli firms producing equipment and materials for use in FPDs in TVs, especially PDP and OLED FPDs, as well as 6G and later TFT-LCD FPDs may find ample opportunities in the Chinese market. Demand for FPDs is expected to increase following a government plan to subsidize countryside purchases of electronics, which would include PCs and TVs.
- Additional opportunities for Israeli firms in the FPD segment include energy saving technologies (especially OLED FPDs due to their energy saving potential) and next generation FPD development.

4.1 OVERVIEW

China's FPD industry has been hit hard by the global economic crisis and the important domestic FPD players in China are all deemed to have suffered losses in 2008. Nevertheless, China has also become a more attractive market in the wake of the economic downturn. As global annual sales in the LCD industry are projected to slow to less than 3% to 2015 (down from 9% from 2002 to 2008), LCD panel makers are increasingly looking to emerging markets to drive growth in the industry. With respect to the market for TV FPDs, China may grow 30% annually to more than 20 million units this year, as compared to only 1-2% growth in more developed regions. The top three FPD producers in China (BOE, SVA and IVO) produced a combined 22.72 million FPDs for desktop computer monitors (12% of global output), 180,000 FPDs for laptop computers (0.16% of global output) and 340,000 FPDs for TVs (0.43% of global output.)

4.2 MARKET STRUCTURE AND TRENDS

FPDs can be divided into Liquid Crystal Displays (LCD), Plasma Display Panels (PDP), and Organic Light Emitting Diodes (OLED). Currently the majority of Chinese companies have only developed capabilities in the development of Thin Film Transistor (TFT)-LCD.



Source: MIIT

TFT-LCD

China's focus on the TFT-LCD segment is the result of government policy issued in 2003, which shortened the minimum depreciation period for TFT-LCD production equipment to 3 years, and provided exemption of import duties for raw materials and manufacturing equipment for TFT-LCD. The import duty exemptions expired at the end of last year, and while the government has announced it would reinstate preferential policies for LCD products in the context of the electronics stimulus plan (see chapter 1.2), no specific details were publicly available at the time of writing this report.

In 2005, Chinese output capacity of TFT-LCD was 4% of worldwide production; it is expected to reach 8% in 2010, almost equal to that of Japan. At the end of 2007, 96 Chinese companies were manufacturing LCD products.

In the first half of 2008, 920 million TFT-LCD units valued at USD 24.2 billion were imported to China (of which the majority came from Taiwan, Japan and Korea), representing an increase of 5.2% compared to the first half of 2007. Of these, 670 million units of total imports were imported by FIEs, up 11% over the previous year period. This indicates that FIEs, while already occupying a larger market share, are expanding their dominant place in the TFT-LCD industry when compared to domestic players.

PDP and OLED

The PDP and OLED segments have yet to reach a stage of development similar to the TFT-LCD segment and much of the recent R&D efforts by industry and government have focused on PDP and OLED. Domestic companies such as Sichuan Changhong Electronic and Nanjing Huaxin High Technology have invested the PDP production lines in 2007 and 2008. Beijing Visionox Technology, Irico Group Electronics, and Shenzhen Hongyang are examples of companies that have recently started or are planning to start construction of OLED production lines.

Geographic Clustering

FPD enterprises are centralized in the YRD, Bohai Economic Rim (Beijing, Tianjin and Dalian areas) and PRD. Guangdong, Jiangsu and Fujian are the main markets for TFT-LCD imports.

In the YRD, Shanghai Video and Audio Group (SVA) and InfoVision Optoelectronics (IVO) have both established 5G

Flagship Companies FPD

Shanghai Video and Audio Group (SVA)

Established in 1995 its primary product line is the LCD television, and they currently boast the largest volume of TFT-LCD production in China.

- Currently building a 6G TFT-LCD panel plant in Shanghai.
- Strategic partnerships and joint ventures with Matsushita, Asahi, Samsung, and Suogang.
- Sells LCD televisions, cathode ray televisions, digital light processing projection engines and televisions, and vacuum fluorescent displays, mobile phones, digital cameras, air conditioners, and refrigerators.
- Sales decreased dramatically in 2008.
- Cooperated with Shanghai University to establish the SVA Research Center for FPD Engineering Technology.

BOE Technology Group Co., Ltd. (BOE)

BOE was the first Chinese company to enter the display systems and solutions field in China.

- By 2007, it had 296 patent applications and 256 invention patents.
- BOE purchased HYDIS electronics in January 2003 to enter the TFTOLCD industry.
- Launched construction of first 6G TFT-LCD facility with USD 2.5 billion in Anhui province in April 2009, and is expected to put it into operation in 2010.

TFT-LCD production lines, and over 60% of global displays and laptops are manufactured in that region by original equipment manufacturers (OEMs). The Bohai Rim houses numerous famous IT and communication, such as Lenovo, Tsinghua Tongfang and Founder Tech. Beijing and Tianjin serve as China's FPD R&D and talent training centers due to the presence of universities and institutes focusing on FPD. Chi-Mei Corporation (a key Taiwan FPD manufacturer) and LG Display have set up manufacturing bases in Guangdong. The PRD focuses on LCD TVs, and numerous domestic TV and telecommunication hardware companies are located there, including Skyworth, Konka, GreatWall, TCL, ZTE and Huawei.

Top Domestic FPD Companies in China (2008)				
Company Name	Product	Province	Sales Revenue in 2008 (USD million)	Website
BOE	Main product- TFT-LCD products	Beijing	1199.33	www.boe.com.cn
IVO	Main product – TFT-LCD products	Jianggsu	300.77	www.ivo.com.cn
SVA	LCDs, Modules and electronic components	Shanghai	117.57	www.sva.com.cn
Sichuan Central Shuanghong Display Co., Ltd.	Research & Manufacturing FPD, especially PDP. No mass production capabilities yet	Sichuan	N/A	www.changhong.com www.irico.com.cn
Nanjing Huaxian High Technology Co., Ltd	Engages in researching and developing PDP products, currently in R&D stage	Jiangsu	N/A	www.smpdp.com
Shenchao Photoelectricity Co., Ltd	5G TFT-LCD, planned mass production by year end 2008	Shenzhen	N/A	N/A

4.3 MARKET CHALLENGES

China's domestic FDP industry is still in a nascent stage of development due to the comparative lack of scale, R&D capabilities, capital, and integrated supply chain that is typically required in this field.

Lack of Access to Manufacturing Equipment and Raw Materials

China has limited domestic access to manufacturing equipment and raw materials used in the production of FPDs, including liquid crystal material, glass panels, and color filters and polarizers. As such, the Chinese FPD manufacturers are forced to import a sizeable portion of manufacturing equipment and raw materials used in FPD production, resulting in high manufacturing costs and a loss of competitive advantage with foreign companies.

Weak Capabilities in R&D and Industrializing Advanced Technology

In spite of government support to promote TFT-LCD and technology transfer, production technologies remain outdated when compared to the main international players.

FPDs can be divided into large and middle/small-sized panels.³ Due to technological shortcomings, Chinese manufacturers' market share for large-sized TV panels is negligible, both at home and overseas. Domestic FPD manufacturers are considerably stronger at producing middle/small sized panels for TVs and general FPDs for PCs and mobile devices. Large-size TV panels in China are still largely dependent on imports.

Currently, there are three key domestic players: SVA, Beijing Optoelectronics Technology Company (BOE) and IVO. These companies focus mainly on producing middle and small sized FPDs. AU Optronics (Taiwan), ChiMei Optoelectronics (Taiwan), Chunghwa Picture Tubes (Taiwan), LG Display (South Korea) and Samsung Display (South Korea) are the leading foreign companies producing large FPDs in China. In 2008, AU Optronics Corporation, ChiMei Optoelectronics, LG Display and Samsung Display dominated China's FPD market for TVs, with a combined market share of 69%. ChiMei Optoelectronics led with 29% market share, followed by LG display with 26%, Samsung Display with 9%, and AU Optronics Corporation with 5%.

Lack of Scale

Each of the top three domestic FPD firms (SVA, BOE, and IVO) currently operates one 5G TFT-LCD production line. This is far below the minimum level of production needed to achieve economies of scale, which would be four or more 5G (or above) TFT-LCD production lines in simultaneous operation.

The lack of scale in general has made foreign suppliers with key FPD technologies reluctant to make significant investments, hindering further technology transfer and general development of the industry. At the same time, domestic enterprises are unable to independently develop raw material industries due to insufficient capital and technology.

4.4 MARKET OPPORTUNITIES

Home Appliances for the Countryside

The government is planning to invest USD 1.5 billion to subsidize appliance purchases in the countryside. The multiple objectives of this program include improving farmers' living standards, stimulating the hard-hit domestic manufacturing industry, and increasing domestic consumption to compensate for the export drop amidst the economic crisis. While the products related to this project are likely to be low-end, they will include mobile telephones, PCs and TVs. As demand for TVs in rural areas will be much higher than PCs and mobile telephones, and China still has to rely on foreign manufacturers for FPDs for TVs, this program may represent a real opportunity for overseas FPD manufacturers to take advantage of and access China's panel market.

R&D Cooperation

According to the stimulus plan for the electronics industry (see chapter 1.2), the government plans to improve next-generation production capabilities in the FPD industry. As such, Chinese government will arrange capital for the industrialization of advanced

³ Large-sized: 32 inch or above for TV panels, 17 inch or above for PC panels; medium & small-sized: below 32 inch for TV panels, below 17 inch for PC panels.

technologies, as well as R&D for new technologies. More particularly, it has announced to support developments in technologies of next-generation FPD production, complete set and module integration design and glass substrate manufacturing via utilization of foreign resources and international cooperation.

Energy Saving Technologies

The Chinese government has increasingly been encouraging energy saving technologies and industrial upgrades. Correspondingly, Chinese consumers are becoming more aware of environmental issues and energy consumption. As a consequence, energy saving TVs (and FPDs) are expanding quickly, and both Chinese and foreign-invested TV manufacturers in China, including Sharp, Sony, Samsung, LG, Hisense, TCL and Skyworth are developing energy conservation technologies.

Next Generation FPD Development

Due to the high technological and capital requirements, China's domestic FPD production capabilities have developed slowly. As a consequence, almost all Chinese TFT-LCD products are 4G or 5G products, representing a gap of two technological generations compared with most developed markets. In order to improve this technological gap and speed up the pace of innovation, the Chinese government has reported plans to invest USD 14.4 billion in the construction of next generation TFT-LCD production facilities. In 2009, the government and companies such as BOE have planned to construct several 6G production facilities and Optoelectronics recently announced its plan to construct a 7.5G production facility. BOE announced in late 2008 that it had started discussions with the central government on the development of an 8G production facility.

4.5 KEY INDUSTRY EVENTS

Asia Flat Panel Display industry Expo

Guangzhou Jinhua Exhibition Center

September 17-19, 2009

Asia Flat Panel Display Industry Expo (Asia FPD) is hosted by Guangzhou Municipal Government and Department of Information and Industry of Guangdong Provincial Government, and organized by Guangdong Flat Panel Display Industry Association. More than 140 exhibitors and 5,000 visitors attended the 1st Asia FPD in 2008. The 2nd Asia (Guangzhou) Flat Panel Display Industry Expo & Seminar will be held on September 17-19, 2009.

www.asiafpd.com

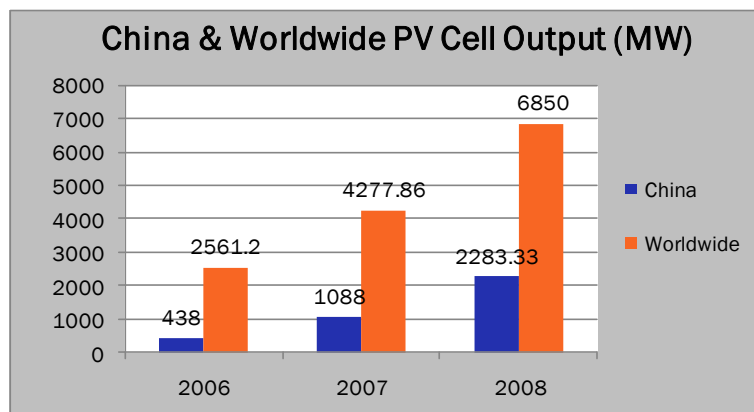
5. PHOTOVOLTAIC PRODUCTS

- China produced the most PV products in the world in 2007 and 2008, and is especially strong in PV cells and modules production.
- The majority of China's PV output is exported, as domestic demand for the product has only recently started to pick up.
- China's PV industry focuses on processing trade, lacking a developed industry chain and advanced technologies. The country also relies on the import of much of the key equipment used in PV production processes.
- Israeli firms that excel in manufacturing equipment and components used in the production of polycrystalline silicon and thin-film PV are suitable for targeting the Chinese market.
- Israeli firms that specialize in the production of solar cells and modules will face strong competition by domestic players. Due to the general lack of solar power plants located in China, Israeli firms specializing in system integration will face limited opportunity in China presently. However, as solar power generation capabilities expand with government support, more opportunities in this regard are expected to emerge in the future.

5.1 OVERVIEW

China had the largest PV products manufacturing output in the world in 2007 and 2008. It is especially strong in PV cells and modules production, and was home to four of the world's top-10 PV cell manufacturers in 2008.

China's PV industry is overwhelmingly engaged in processing trade and lacks a well developed chain with advanced technologies. Due to technological shortcomings at home, more than 90% of key PV raw materials and equipment are imported from the U.S., Germany, and Japan. Because of the comparatively limited domestic solar power market, around 98% of all PV products are exported, with top destinations including Germany, Spain, the U.S. and Japan. In 2008, Chinese firms had 90% market share of the German market for PV cells and modules. Regarding Thin Film PV products, most projects are currently in the R&D stages, and there currently exist no mass manufacturing capabilities.



Source: China Renewable Energy Development Project

As a result of its dependency on overseas markets, China's PV segment has been deeply affected by the global economic crisis. By June of 2008, over 600 PV companies were operating in China, more than 70% of which were PV module companies. However, by the end of 2008, over 350 PV (mostly small-sized) module companies had to close down due to the global economic crisis. Currently, there are only 50 PV module enterprises remaining.

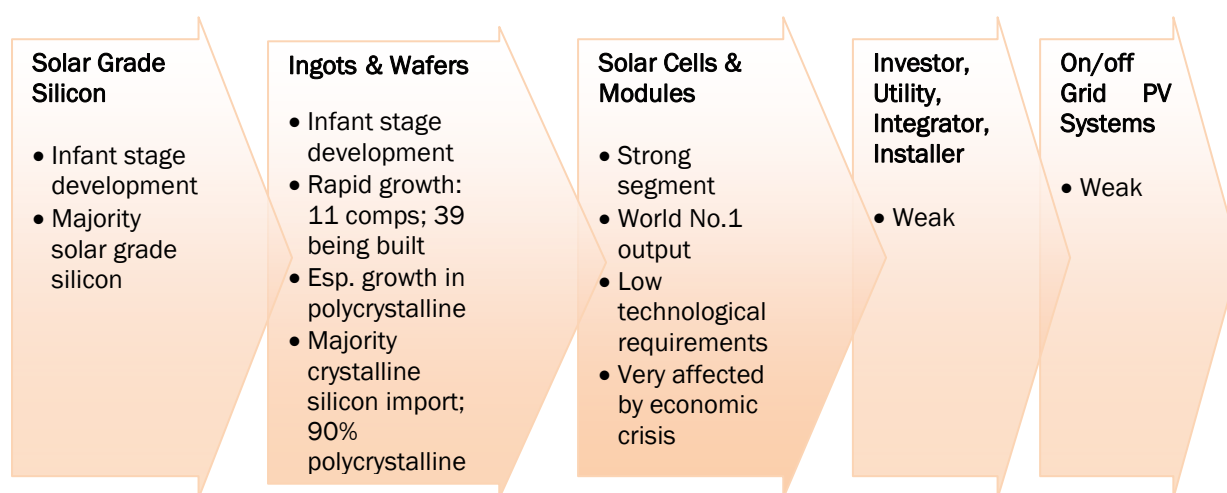
However, despite the current slowdown, growing domestic and international demand, largely driven by government policy, are expected to serve to revitalize the sector. Domestically, the Chinese government has promulgated several policies including the Solar Energy Roof Plan and additional planned solar power generation projects to boost domestic demand in the industry, which has been relatively insignificant. China also hopes to take advantage of the renewable energy development plans in the Obama administration's stimulus plan. It is anticipated that Europe, the world's largest consumer of PV cells and modules, will need two to three years before the market rebounds to pre-crisis levels.

Signs are positive for the return of growth in the industry. A large number of the above mentioned 350 PV firms forced to close were small to medium sized companies that had entered the industry in early 2008, with limited production scale. Additionally, Suntech, a leading PV firm in China, reports 750MW of orders to date in 2009, surpassing last year's orders over the same period by 250MW. Additionally, the company began re-hiring workers in March that were laid off last year, another sign that production levels are increasing. China's PV industry will continue to be dominant, especially as domestic demand begins to pick up with the development of domestic solar generating capacity.

5.2 MARKET STRUCTURE AND TRENDS

The PV supply chain includes solar grade silicon, ingots and wafers, solar cell and modules, utility and installation, and the on/off grid PV system (see the flow chart below).

Due to lower technical requirements, China is well-developed in the PV cells and modules segments. Most of the top Chinese PV companies are PV cells and modules manufacturing enterprises, such as Wuxi Suntech Power Holdings Co., Ltd., Changzhou Trina Solar Energy Co., Ltd., and Yingli Green Energy Holding Company Limited..



Geographic Clustering and Competitive Landscape

As can be seen in the table below, the domestic PV industry is centralized in Sichuan, Jiangsu, Hebei and Jiangxi provinces. The table also indicates that the main market share is divided by the top six domestic PV companies.

Top PV Companies in China (2008)					
Company Name	Product	Province	Module Output (MW)	Sales Revenue in 2008 (USD million)	Website
Wuxi Suntech Power Holdings	PV cells and modules	Jiangsu	1000	1,923.5	www.suntech-power.com
Yingli Green Energy Holding Company Ltd	PV ingots, wafers, cells, modules, PV systems	Hebei	281.5	1,107.1	www.yinglisolar.com
Changzhou Trina Solar Energy	PV wafer, ingots, cells and modules	Jiangsu	201	831.9	www.trinasolar.com
JA Solar Holdings	PV wafer, ingots, cells and module	Hebei	277	800	www.jasolar.com
Solarfun Power Holdings Co., Ltd.	PV cells and modules	Jiangsu	172.8	725.4	www.solarfun.com.cn
Canadian Solar Inc. (Suzhou)	PV ingots, wafers, cells and modules	Jiangsu	620	709	www.canadian-solar.com
China Electric Equipment Group Corporation (CEEG)	PV cells and modules	Jiangsu	125-145	370	www.ceeg.cn
Jiangsu Zhongneng Polysilicon Technology Co., Ltd.	Polycrystalline silicon	Jiangsu	n/a	n/a	www.gcl-silicon.com
Ningxia Sunshine Silicon Co., Ltd.	Polycrystalline silicon	Ningxia	n/a	Put into operation in the end of 2008	n/a
Inner Mongolia Shenzhou Silicon Co., Ltd.	Polycrystalline silicon	Inner Mongolia	n/a	Expect to put into operation in 2009	n/a

5.3 MARKET CHALLENGES

Lack of Technological Capabilities

In order to reduce technological dependence on foreign companies and encourage development of indigenous innovation, China's government has tried to support China PV enterprises' engagement in R&D of PV products and raw materials. However, these efforts have so far had limited success.

Lack of Manufacturing Equipment

Chinese companies only have the capability to produce simple equipment such as polycrystalline silicon casting machines, growth furnaces, cylinder, roller and cutting machines for monocrystalline silicon, cleaning machines, some types of diffusion furnaces, and plasma etching and sintering furnaces. However, much of the key equipment still depends on imports, such as the plasma-enhanced chemical vapor

deposition (PECVD), roasters, silk screening printing machines, multi-wire sawing machines and automatic printing equipment.

5.4 MARKET OPPORTUNITIES

Manufacturing Equipment for Polycrystalline Silicon

China falls considerably short in core technologies required for producing key raw materials and equipment. Consequently, there has been a recent push to develop local polycrystalline silicon production capabilities, with Chinese companies investing more than USD 14.4 billion in this effort.

Thin-Film PV

In addition, thin-film PV (TF PV) technologies and products are expected to experience rapid development in the near future due to TF PV's cost advantage and production process that eliminates the need for polycrystalline silicon. TF PV is in a rapid pace of development with the advantages of being low-cost, light-weight and flexible; the low cost advantage serves as the main driver behind the development of the segment.

Solar Energy Roof Plan

Aiming to speed up the application of PV products and develop the domestic solar energy market, China issued new provisions on March, 23 2009, outlining its "Solar PV Roof Plan." Accordingly, China will offer subsidies to solar power construction projects, encourage innovation and technology R&D, and encourage local governments to formulate related policies to support the development of PV industry.

Solar Power Generation Projects

China currently has an installed PV power capacity of 1,255KW: 1 MW for Shanghai's Chongming Island Solar Power Station, and 255KW for Inner Mongolia's Solar Power Station. The country plans to reach 300MW by 2010 and 1800MW by 2020, providing ample opportunities for domestic and foreign PV enterprises. As the first PV power generation demonstration project, Gansu Dunhuang 10MW Power Farm completed its public bidding process on March 20 2009, which included an investment of USD 72 million. Expected projects include a 69MW PV power project in Yunnan province, a 1G PV power project in Qinghai province and a PV project in Jiangsu province, proposals of which have been submitted to the central government for

Flagship Companies Photovoltaic Equipment

Wuxi Suntech Power Holding Co., Ltd. (Suntech)

Suntech is one of the leading solar energy companies in the world, with offices in Munich, Madrid, San Francisco, Seoul, Sydney and Tokyo. Suntech designs, develops, manufactures and distributes monocrystalline and polycrystalline PV cells and modules, and became a publicly listed on the New York Stock Exchange in 2005.

- Revenues for 2008 of USD 1923.5 million, representing a 42.7% increase over 2007.
- Was the No.3 PV manufacturer in the worldwide in 2008.
- Bad sales performance in Q4 2008, forced it to shut several production lines and lay off 1/3 of its workforce.

Yingli Green Energy Holding Company Limited

Yingli specializes in developing, manufacturing, engineering, sales, and after-sale services of PV wafers, cells, modules and application systems. It is a 49 % subsidiary of Tianwei Baobian Electric Co. and a 51 % subsidiary of Baoding Yingli Corporation Co.

- Based in Baoding, Hebei.
- Maintains an 80% export rate.
- Sales revenue USD 1.09 billion in 2008.
- Second largest PV company in China, ranked No. 7 worldwide in 2008.
- Listed on NYSE in 2007.

procurement approval. Beijing and Shanghai are also drafting further PV power development plans.

5.5 KEY INDUSTRY EVENTS

AsiaSolar Energy PV Exhibition & Forum

Shanghai Mart

March 30-April 1, 2010

AsiaSolar Energy PV Exhibition & Forum is approved by the China Council for the Promotion of International Trade (CCPIT), and hosted by the China New Energy Chamber of Commerce of ACFIC, Solar Photovoltaic Power System of Standardization Administration of China, Tianjin Institute of Power Sources, CCPIT Pudong Sub-Council and Shanghai Pudong International Exhibition Corp.

The overall value of direct transactions at the 2008 Expo was about USD 1.7 million. There were 285 exhibitors in 2008 and more than 400 in 2009, 30% of which were overseas exhibitors. The number of visitors reached nearly 26,000 in 2008 and 30,000 in 2009. The next forum will be held on March 30 – April 1, 2010.

www.asiasolarexpo.com

APPENDIX I: CHINA MAP



APCO CONTACT DETAILS

For further information please contact:

<p>BEIJING Sharon Ruwart, Managing Director 16/F, NCI Tower 12 A Jianguomenwai Avenue Chaoyang District Beijing, China 100022 Phone: +86.10. 6505.5127 Fax: +86.10.6505.5257 sruwart@apcoworldwide.com</p>	<p>SHANGHAI Murray King, Managing Director 2102 CITIC Square 1168 Nanjing Road West Shanghai, China 2000041 Phone: +86.21.5298.4668 Fax: +86.21.5298.4669 mking@apcoworldwide.com</p>
<p>HONG KONG Catherine Wong, Managing Director 19/F, Cambridge House, Taikoo Place 979 King's Road Hong Kong Phone: +852.2866.2313 Fax: +852.2866.1917 cwong@apcoworldwide.com</p>	