Industry Geographic Distribution

The following report summarizes the geographic/industry cluster mapping in China to the best effort of the IEICI.
**Enterprise Software**

Beijing has traditionally been the center of China’s software industry - although Guangdong province, Jiangsu province and Dalian city have emerged as growth hubs.

**Beijing**
Beijing is widely recognized as the center of the country’s software industry. Out of China’s top 100 software companies ranked by revenue, 22 companies are headquartered in Beijing. The city is also home to 50 “national-level key software companies” which the Chinese government hopes to develop into national champions. Beijing’s software industry maintained an average annual growth rate of 28% over the past decade, and even grew 17.4% year-on-year (yoy) to RMB 188.2 billion [USD 28.3 billion] during the middle of the global economic slowdown in 2009.

**Guangdong Province**
Guangdong’s software industry is now China’s largest, with RMB 197.8 billion [USD 30 billion] in revenue in 2009, accounting for just over 20% of China’s total software revenue. 98.6% of the province’s software industry revenue comes from the Pearl River Delta Region, namely the cities of Shenzhen, Guangzhou and Zhuhai.

**Jiangsu Province**
Jiangsu province is also emerging as a major software center in China. In 2009, revenue from its software industry grew 27.2% to RMB 160.6 billion [USD 24 billion], comprising 16% of China’s total software industry revenue.

Jiangsu’s software industry also developed around an existing hardware manufacturing industry. In recent years, the Chinese government has sought to promote Jiangsu province, particularly the provincial capital Nanjing, as a center for software development.

**Dalian City**
The port city of Dalian in Liaoning province is the center of northeast China’s software market. Dalian’s software industry is focused primarily on providing software outsourcing services for multinational companies, and the city ranks first in China and fifth globally for offshore software delivery. In 2009, revenue from Dalian’s software industry was RMB 60.3 billion [USD 9 billion], up 36.8% yoy.
Electronics

● Semiconductor

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

The Pearl River Delta is the largest consumer electronics manufacturing base in China, with high levels of R&D capabilities and comprehensive logistics services. A number of famous domestic brands include Gree, Midea, Galanz, and TCL are located here. The Yangtze River Delta and the Bohai Rim area also play an important role in consumer electronics manufacturing in China, including Hisense, Haier and Inspur. However, due to rising labor costs in coastal areas and government support of industries relocating to western areas, manufacturing of consumer electronics is likely to shift to western China in the near future.

● Flat Panel Displays

Flat Panel Displays 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.

There are five 5G-and-above TFT-LCD production lines in the YRD currently (a total of seven in China). Furthermore, the top 10 FPD TV manufacturers, computer manufacturers, and LCD manufacturers in the world have manufacturing bases in the YRD.

The Bohai Rim houses numerous well-known IT and communication companies, such as Lenovo, Tsinghua Tongfang and Founder Tech. Beijing and Tianjin serve as China’s FPD R&D and talent training centers.

The PRD focuses on LCD TVs, and numerous domestic TV and telecommunication hardware companies are located there as well, including Skyworth, Konka, GreatWall, TCL, ZTE and Huawei.
Medical Devices & Healthcare IT

Due to the current distribution of China’s healthcare services, the market opportunities for both medical devices and healthcare IT have strong regional considerations. Significant disparity exists in China’s healthcare capabilities, with certain provinces possessing world-class capabilities and other regions lacking even basic care for much of its inhabitants. City centers such as Beijing, Shanghai and Tianjin have relatively high doctor to patient ratios. However, once one leaves the city centers and travels to rural China, particularly southwestern China, the ratios become much lower, dropping to a low of 0.81 doctors per thousand patients in Guizhou. China’s plan to construct new facilities will be focused in the regions currently facing low doctor to patient ratios.

In response to the government’s call for wider utilization of IT in the healthcare industry, the developed coastal regions have kicked off a series of healthcare IT trials. Beijing and Shanghai, together with other developed cities in the east and south coast, are taking the lead in establishing a unified healthcare IT system in China. Significant investment is therefore already underway in these developed markets. However, China is seeking to encourage IT investments in rural regions by selecting 22 provinces and municipalities for a pilot program to trial a system that can better use and manage electronic medical records. The program includes the following provinces: Hebei, Liaoning, Heilongjiang, Jiangsu, Anhui, Fujian, Jiangxi, Shandong, Henan, Hubei, Hunan, Guangdong, Guangxi, Sichuan, Guizhou, Yunnan, Shanxi, Qinghai and Xinjiang. The two municipal cities are Beijing and Shanghai.

Telecom

The geographic clustering of information and communication technology investment and markets follows China’s general pattern of development. Eastern and coastal provinces and cities (especially Beijing and Shenzhen) have the strongest capacity and largest user bases in the communication sector, while western regions where economies are less developed are less competitive in the sector.
Renewable Energy

● Solar Power

Solar Water Heating (SWH)

Shandong Province is currently the national and global production center for SWH. It is home to almost 400 manufacturers producing over 100 million sq. m a year of concentrated heat vacuum tubes. Three of the leading global SWH companies by production capacity are also based in Shandong Province – Himin Group, Shandong Sangle Solar Energy and Linuo Paradigma Solar Energy.

PV

In an effort to consolidate the industry and improve product quality, China is supporting PV R&D programs housed within the market leaders. In January 2010, the Ministry of Science and Technology (MOST) approved a national-level key laboratory for PV technology R&D to be established at Yingli’s manufacturing base in Baoding, Hebei Province.

● Wind Power

Within China, most of the installed wind capacity is gathered around the eastern seaboard and Northern provinces. The most capacity exists in Inner Mongolia (9.2 GW by end of 2010). These regions are rich in wind resources.

In 2010, the government began the bidding process for a future total of 13 GW worth of projects in Liaoning, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian and Guangdong Provinces. Through this process, China can stimulate market development by reducing operational risk to developers and also control market entry.

2 MW above Turbine Technologies

Opportunities are greatest in the large wind turbine market segment (above 2 MW). China has plans to invest an additional RMB 120 billion to build a series of 10 GW and above mega projects in Gansu (12.7 GW), Xinjiang (10.8 GW), Inner Mongolia (two projects totaling 57.8 GW), Jiangsu (10 GW), Hebei (10.8 GW) and Jilin Provinces (23 GW).

● Biodiesel

In 2008, NDRC selected China’s southwestern provinces as the designated region to cultivate cellulosic feedstock for biodiesel production, envisaging the establishment of around 800,000 hectares of jatropha plantations. The first three pilot plants producing biodiesel from jatropha will be led by Sinopec, CNOOC and PetroChina.

High Quality Biodiesel Production from Direct Plant Oil
More opportunities exist in the biodiesel sector - particularly in producing higher quality biodiesel directly processed from plant oil rather than waste oil or grease trap waste. Austrian bioenergy firm Biolux established a biodiesel project in Jiangsu Province in 2006 which would produce biodiesel from rapeseed oil.
Energy Efficiency and Grid Management

Smart Grid

The smart grid industry is developing particularly fast in Shanghai and Jiangsu, where it is benefiting from strong government support. The first urban smart grid trial project is taking place in Tianjin, which provides immediate opportunities for Israeli companies. The Tianjin case will serve as a model for future smart grid development in other cities.

Shanghai
In May 2010, the Shanghai Municipal Government issued the Shanghai Smart Grid Industry Development Action Plan (2010-2012).
It aims to establish three smart grid bases, including smart grid demonstration and application base, smart grid key technology research and development base, network core equipment industry base.

Furthermore, the Shanghai Municipal Government and State Grid Corporation signed a Smart Grid Strategic Cooperation Agreement in July 2010 to establish Shanghai as a strategic R&D and equipment manufacturing base for the nascent smart grid industry.

Jiangsu Province
The Jiangsu Provincial Government has issued the Jiangsu Provincial Smart Grid Industry Development Planning Outlines (2009-2012) to boost the smart grid construction and industry development in Jiangsu.

According to the plan, Jiangsu Province will invest over RMB 20 billion [USD 3 billion] annually in the construction of a smart grid, from 2010-2015. The industry value of the smart grid by 2012 will reach RMB 150 billion [USD 22.6 billion] and RMB 300 billion [USD 45 billion] by 2015.

Tianjin
The first smart grid comprehensive demonstration project began construction on April 7th, 2010, located in the Sino-Singapore Tianjin Eco-city. The project constituted a strategic cooperation initiative between China and Singapore.

According to the project plan, renewable energy will contribute to 24.62 percent of the econ-city's total electricity consumption.
The project will also provide households with “intelligent energy consumption” services, including remote meters, real-time household energy consumption monitoring and household security monitoring.

● Energy Efficiency

Opportunities for energy efficient technologies exist across the country's industrial bases in the major manufacturing regions of China. This mainly includes the developed coastal regions and large interior cities. The key high-
energy consuming SOEs are headquartered in Beijing, making it of particular importance.

**Eastern China** (including Jiangsu, Zhejiang, Shanghai and Anhui) is the largest central air-con market, followed by **northern China** (Beijing, Tianjin, Hebei, Shandong, Shanxi and Inner Mongolia) and **southern China** (Guangdong, Guangxi, Fujian and Hainan).

For entering the building energy efficiency market in China, companies are advised to start with the most developed and commercialized provinces and cities in China, including Beijing, Shanghai, Guangzhou and Shenzhen, as the market in these areas is bigger, more mature and more accessible.
**Agriculture**

**Sichuan**

As a national leader in the agricultural industry, Sichuan’s provincial government has taken active action to improve the industry’s development. Strong support from the government at both the central and provincial level lays the foundation for future cooperation.

A wide variety of demands for knowledge transfer, equipment and technology in the province creates, together with an unsaturated market, significant opportunities for Israeli firms in the agricultural sector.

**Xinjiang**

Xinjiang has been a top priority in the Chinese government’s agenda to strengthen societal and economic development, particularly in the agriculture industry. In addition to benefiting from preferable polices, Xinjiang is a site of Sino-Israeli cooperation.

Certain geophysical similarities between Xinjiang and Israel create business opportunities in the agricultural sectors where Israeli companies have expertise, such as irrigation, dairy, and greenhouse technologies.

**Hebei**

Hebei is one of China’s major agriculture production areas, renowned for its wheat and cotton, as well as its animal husbandry and dairy industries.

Surrounding Beijing and Tianjin, Hebei plays an important role in consistently supplying the Beijing-Tianjin-Tangshan economic zone with food. Thus, the province has attached much emphasis on adopting advanced water-saving irrigation systems to solve problems related to drought, in addition to researching strong seed varieties for breeding to ensure sufficient crop output.

Recovering from the impact of the Sanlu Milk scandal, Hebei’s dairy industry continues to urgently work to return to its former position as a leading province in the national dairy market.
Automotive

So far there are six relatively mature automotive industrial clusters in China. They are the Changchun-led Northeast Traditional Industrial Base, the Shanghai-led Yangtze River Delta, the Wuhan-led Central China Area, the Beijing-Tianjin Area, the Guangdong-led Pearl River Delta and the Chongqing-led Southwest Area.

(Source: http://www.motorlink.cn/html/newsletter/en20120307.html#content1)

Overview of the development of the six automotive industrial clusters

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<th>Region</th>
<th>Plan</th>
<th>Scale</th>
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<td>Changchun-led Northeast Traditional Industrial Base</td>
<td>According to the 12th Five-year Plan announced by Jilin Province, the provincial government will invest 150 billion Yuan to build 100 key automotive projects to achieve a yearly capacity of 4 million vehicles with the self-supply parts rate up to 50%. By that time the output value of the automotive industry in Jilin Province will exceed 800 billion Yuan.</td>
<td>Jilin Province is building an automotive-industry-based city cluster, which is led by FAW and covers various auto-related sectors including auto R&amp;D, parts supply and logistic service. This cluster includes Changchun, the old automotive manufacturing base, and Jilin (city), Siping, Liaoyuan and Yanji etc.. This indicates that over half of the cities in this province will get involved in auto-related businesses.</td>
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<td>Shanghai-led Yangtze River Delta</td>
<td>Shanghai has set an over-6million-vehicle sales target for 2015. New energy is the top priority of its hi-tech automotive industrialization. According to the plan, by 2012 the full range of hybrid vehicles, including mild, intermediate and full hybrid models, will realize industrialization and the new energy vehicle industry will begin to take shape. By that time, the new energy vehicle industry in Shanghai will be valued at 90 billion Yuan with the related auto parts output value reaching 10 billion Yuan and the vehicle output value 20 billion.</td>
<td>The automotive industry in Shanghai boasts mature automakers, professional auto parts makers and auto machinery and service suppliers, and auto financing companies etc. In addition, the downstream market (including sales networks and customer bases), complementary product makers, professional infrastructure supply, government support and other related training, education, information, research and technology support (e.g. universities, think-tanks and vocational training institutes) and standard-makers have also reached scale.</td>
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<td>Wuhan-led Central China Area</td>
<td>In next 5 years, the total output value of the automotive industry in Wuhan will exceed 300 billion Yuan, accounting for 20% of the city’s total industrial output value. According to the plan, by 2015, the automotive industry in Wuhan will achieve a yearly capacity of 1.8-2 million vehicles, including 200 thousand energy-efficient and new energy vehicles and over 80 thousand special vehicles and vans.</td>
<td>Currently, the automotive industry has become a leading industry in Hubei Province, and a Wuhan-Xiangfan-Shiyang auto parts industrial belt has been created there. The provincial government has not only further developed its old commercial vehicle industry but also attracted a lot of large international auto brands such as Peugeot-Citroen and Honda to settle there.</td>
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<td>Beijing-Tianjin Area</td>
<td>According to Beijing automotive industry’s 12th Five-year Plan, Beijing will foster an over-300 billion-Yuan-output multi-national automotive group and three over-100 billion-Yuan-output automakers by 2015. According to Tianjin’s 12th Five-year Plan, the automotive industry’s output value will account for 20.0% of the total output value of the Tianjin Development Zone by 2015, with 130 billion Yuan created by automakers and 70 billion Yuan by auto parts makers.</td>
<td>Currently Beijing and Tianjin have their own development plans. If both succeed, the two cities will form a strongly attractive “automotive industrial cluster” to boost the automotive industry’s development in this area. The Tianjin Development Zone will adjust its automotive industrial structure. That is developing commercial and special vehicles on the basis of passenger vehicles and extending the auto industrial chain to increase the share of the auto</td>
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In Guangdong, the automotive market value is expected to exceed 2.5 trillion Yuan by 2015. According to Guangdong’s automotive industry development plan, by that year, the provincial automotive output will achieve 4.5 million vehicles, three times as much as current output, and the output value will amount to around 1 trillion Yuan, 3 times as much as the value in 2010. If the auto parts industry and the automotive industry reach a balance by that time, the total output value of the auto parts industry will exceed 1.5 trillion Yuan.

It is apparent that China’s automotive manufacturing center is slowly shifting to the south area. The Pearl River Delta, which is centered on Guangzhou, Shenzhen and Foshan, has become one of the important automotive manufacturing bases in China. With CA PAS and FAW-VW settling down in Shenzhen and Foshan, the Guangzhou-Shenzhen-Foshan automotive industrial triangle has formed, which is expected to further intensify the cluster effect.

Chang’an Group has initiated a 100-billion-yuan and 10-thousand-mu Auto City project in Yuzui, Chongqing. The project will take on an all-dimensional industrial layout featuring Chang’an’s headquarters, R&D center, vehicle and engine production, new energy vehicle production, auto parts making and logistic center. Now the project has started operation, and the Two River New Zone, where the project is located, has also put up the slogan of “Creating an International Auto City Specializing in both manufacturing and R&D”.

### Emerging Automotive Industrial Clusters Holding Big Ambitions

Apart from the foresaid six major automotive industrial clusters, many other cities also throng to go manufacturing vehicles. Nanjing, Wuhu, Shenzhen, Nanchang, Hefei, Xi’an, Liuzhou, Yancheng, Changsha, Lanzhou, Daqing, Changshu and Dalian all want a share from this “Cake.”

- auto-parts manufacturing


In general, most of China’s key auto-parts manufacturing zones and clusters are located in coastal areas, especially in Jiangsu, Hebei, Zhejiang, and Fujian provinces. In Jiangsu, for example, there are now a total of 13 major auto-parts production zones, the largest number of any province in China.

#### Jiangsu Province

With an automobile production volume of about 1.5 million units and automobile sales revenues of 280 billion renminbi (RMB, or Chinese yuan) per year, Jiangsu Province is a major production base for assembled vehicles and auto parts and accessories.

#### Zhejiang Province

About a million new cars are expected to be produced in Zhejiang Province.
this year (2010), and new-car sales revenue in the province will amount to around 80 billion RMB.

**Anhui Province**

Luan is a major industrial citadel in eastern China’s coastal province of Anhui, and it has listed the automotive industry as a key industry for priority development in its latest industrial development plan. An estimated five billion RMB will be poured into this line by 2011, which is expected to create an annual production value of 10 billion RMB next year. By 2015 a total 30 billion RMB will have been invested in Luan’s automotive industry, generating expected revenues of 50 billion RMB that year.

**Fujian Province**

Fujian is a major automotive production base, with seven assembled-car makers, six low-speed cargo-vehicle makers, 18 special-use vehicle manufacturers, and more than 400 auto-parts suppliers employing a total of about 68,400 workers in 2008. The carmakers alone assembled 110,000 vehicles worth 40.3 billion RMB that year.
Water

While China as a whole faces severe water scarcity problems rooted in rapid industrialization, its solution to the water problem must be explored at the basin or sub-basin level due to China's huge geography and extreme regional differences.
In southern China's Yangtze and Pearl River basins where there is sufficient surface runoff, surface water levers that can help capture the areas' plentiful resources will be of most value. In northwest and northeast China, groundwater levers will also be of demand, although over-extraction in the regions has already put pressure on groundwater supplies. The most water-scarce regions (the Hai, Huang and Huai basins) will require significant water transfers (from Southern China). Wastewater recycling and seawater usage solutions will also be used to fill the demand gap.

China is also beginning to explore desalination to take advantage of coastal water resources. Large facilities have been proposed along the coast of cities and provinces such as Tianjin and Zhejiang.
**Geographic Terms:**

**PRD:** The **Pearl River Delta Region**, in Guangdong province, is the low-lying area surrounding the Pearl River estuary where the Pearl River flows into the South China Sea. It is one of the most densely urbanised regions in the world and one of the main hubs of China's economic growth.

The core cities are: Dongguan, Foshan, Guangzhou, Hong Kong, Huizhou, Jiangmen, Macau, Shenzhen, Zhongshan, Zhuhai, Zhaoqing

**YRD:** The **Yangtze River Delta** generally comprises the triangular-shaped territory Shanghai, southern Jiangsu province and northern Zhejiang province of China. It covers an area of 99600 km2 and is home to over 105 million people as of 2010, of which an estimated 80 million is urban.

The core cities are: Shanghai, Nanjing, Hangzhou, Suzhou, Ningbo

**BER:** The **Bohai Economic Rim** is used to describe the economic hinterland surrounding Beijing and Tianjin. It also includes areas in Hebei, Liaoning and Shandong which surrounds the Bohai Sea. This emerging region is rising as a Northern economic power house and rivals the Pearl River Delta in the south and the Yangtze River Delta in the east.

The core cities are: Beijing, Tianjin, Tangshan, Qingdao, Dalian

**Yellow River Delta:** The Yellow River Delta is flanked by the Shandong Peninsula to the north and Liaodong Peninsula to the east. It sits right at the confluence of China’s Bohai Economic Zone and the economic belt of the Yellow River reaches, separated from Japan and Korea to the east by the Yellow Sea. This favorable location will enable the area to become a major raw materials center for north-eastern Asia in the future.