

CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

Department of International Cooperation

No.19

Ministry of Science and Technology(MOST), P.R.China

October 10 2013

Special Issue: National New and High Technology Industrial Development Zones in China

- **National Hi-tech Zones**
- **Zhongguancun Science Park**
- **Wuhan East Lake High-tech Development Zone**
- **Xi'an High-tech Development Zone**
- **Baoding National Hi-tech Industrial Development Zone**

National Hi-tech Zones

Building national new-and high-technology industrial development zones was a major decision of strategic importance. The decision was made by the Central Party Committee and the State Council during the process of implementing reform and opening up policies and advancing China's modernization. It's an essential movement in the face of the challenges brought about by the global technological revolution, aiming at deepening the reform in both economic system and the system for managing science and technology. It is also the result of the central and local governments' efforts to seizing opportunities, making scientific decisions and working in concert.

In 1985, the Central Party Committee issued the Decision on the Reform of the System for Managing Science and Technology. The Decision facilitated the integration of science and technology with economy, encouraged science and technology professionals to start business and promoted the establishment of science and technology parks in localities with enabling conditions. By the end of 1987, related central departments, after extensive surveys and researches, completed the compilation of *Research Report on Zhongguancun's "Electronics Avenue"*, in which the inception of Zhongguancun Science and Technology Industrial Park was proposed. In 1988, the State Council approved

Monthly-Editorial Board: Building A8 West, Liulinguan Nanli, Haidian District, Beijing 100036, China

Contact: Prof.Liu Zhaodong E-mail: c_liuzdworld@sina.com hixiaosun@163.com <http://www.caistc.com>

and jumpstarted the Torch Program (*huoju jihua*), an initiative which explicitly highlighted the building of hi-tech industrial development zones as a main focus. Under this Program, the Beijing New Technology Industrial Development Experimentation Zone was incorporated. It was the first of such zones with distinct features of high technologies and new technologies. Between 1991 and 1992, the State Council approved to establish 51 national new-and high-technology industrial development zones (hereinafter referred to as “hi-tech zones”) in different localities, promulgated various policies and ushered in the new era for the development of hi-tech zones in China.

In 2009, to cope with the international financial crisis and world economic recession, the State Council issued the *Advice on Relying on the Role of Science and Technology to Underpin the Sound and Robust Economic Development*. The Advice provided that “national hi-tech zones should be fully leveraged to play a pooling, radiating and motivating role in leading the new and high technology industries and support the local economic growth”. During this period, the State Council approved the successive inceptions of “National Innovational Demonstration Zone” within the hi-tech zones of Zhongguancun in Beijing, Zhangjiang in Shanghai, and East Lake in Wuhan. This was another milestone measure taken in tandem with the effort of building China into an innovative nation, opening a new chapter for the development of national hi-tech zones. Moreover, the State Council heeded the call of the reality to accelerate raising the administrative status of provincial hi-tech zones. After provincial-level zones in Yangling of Shaanxi province and Ningbo of Zhejiang province were given the national status respectively in 1997 and 2007, another 51 provincial zones were elevated to become national-level ones in 2009. As a result, the total number of national hi-tech zones reached 105 and a brand new industry layout was in place.

Over the past two decades, the national hi-tech

zones have been adhering to the policies of reform and opening up, pursuing home-grown innovation, and practicing the insightful judgment that science and technology constitute a primary productive force. The zones proactively promote the integration of science and technology with economy, the combination of market and government, and of central government and local governments. As a result, innovative resources are pooled together and leveraged to enable hi-tech enterprises to grow rapidly, producing enormous amount of innovative achievements. The vibrantly booming new-and hi-tech industries leads to the harmonious progress that are made in every economic and social front, thus playing a leading and exemplary role in China’s economic restructuring and growth mode transition. The national hi-tech zones now serve as a beacon of China’s development approach of relying on scientific advancement and technological innovations to underpin economic and social development and blaze the trail of home-grown innovation with Chinese characteristics; a main launching pad for China’s new-and hi-tech industries; and a champion in strategies of scientific development, innovative development and sustainable development. These zones have the following key features:

1. Hinged on reform to explore and build new-type industrial parks

National hi-tech zones have been committed to liberalizing and developing productive forces through institutional reforms. Innovations in institutional settings are treated as equally important as technological innovations. In so doing, the hi-tech zones tie technologies closely with economic incentives, foster enterprises to become technological innovators, and, for the first time, set up new mechanisms and new modes conducive to tapping the potential of technological and innovative resources, creating a favorable environment for the robust development of new and hi-tech industries.

National hi-tech zones press ahead reforms among the

enterprises to establish modern corporate management systems, explore mechanisms and systems that are helpful to establish the enterprises as the key actor in market and keep improving policies and regulations that enable enterprises to grow and become champions of innovation. The zones also make open explorations on the synergy between enterprises, universities and research institutes, technological and financial interaction, talents recruiting and developing, among others. At the same time, pro-innovation and pro-entrepreneurship organizations are supported by the zones, and public service platforms are opened, constituting a well-structured, well-functioning service system with distinct features. These cater to the needs of technology-based enterprises in innovating, and promoting the open sharing of scientific and technological resources. Following the philosophy of "small government and big service" and in accordance with the patterns of technological innovation and hi-tech industrial development, national hi-tech zones also establish a new-type of managing and operating system that is streamlined in its structure, staffed by adequate personnel, guided by laws and regulations, and dedicated to providing effective and efficient services. In these zones, the government's role in organizing monetary resources is fully leveraged to explore the new approaches to combining technological resources and financial resources and incentivize social capital to flow into these new-and high-technology industries by providing seed funding, venture capital, loan guarantees, and assistance in public offerings. In so doing, the monetary foundation is solidly laid out for expansion in industrial spectrum and corporate strengths. International development and service platforms involving R&D collaboration, technology transfer, service outsourcing and international business are established and a large amount of foreign-funded hi-tech companies, R&D institutions, venture capital organizations are attracted to set up presence in the zones, providing quality services to prepare the enterprises to compete in the international arena.

2. Motivating innovations within business community to drive local economic growth

National hi-tech zones have been the innovation frontier, with the level of technological innovation, technological input invested, new technologies and products produced, patents filed and the share of technology-based enterprises that is not seen anywhere else in the country. Over the past two decades, the synergy between enterprises, universities and research institutes has been continuously carried forward, new-type R&D organizations developed, emerging industrial formats fostered, innovation carriers established and the transfer and commercialization channels for new-and high-technology built comprehensively.

In 2012, funds earmarked for R&D in national hi-tech zones totaled 274.91 billion yuan, or 35.6% of the national R&D funds. The ratio of total R&D inputs to the total value of overall production was 5.2%, 1.7 times higher than the national average. In 2012 alone, 42,500 patents for inventions were granted within national hi-tech zones, accounting for 19.6% of the total of its kind that year. In the hi-tech zones, every ten thousand professionals own 107.5 patents for inventions, 8.4 times higher than the national average (11.4 for 10,000). In terms of R&D of cutting-edge technologies, major products and equipment manufacturing and adoption of international technological standards, the national hi-tech zones have reached enormous amount of achievements. Breakthroughs are made successively in areas as varied as high-performance computing, high-efficiency broad band information network, artificial nonlinear crystal, nano materials, MEMS-based sensors, smart robot, Chinese language information processing, quantum communication, vaccine for human infection with avian flu, 3G/4G technologies and standards and fuel cell technology, breaking new ways for industrial development. According to the statistics, national hi-tech zones are home to 739 incubators for technology-based enterprises, 50 national university-sponsored

science parks, 441 technology transfer institutions, 175 productivity promotion centers, 732 products inspection and examining organizations with authorities vested by the state, 504 strategic alliances of industrial and technological innovation, along with industrialization bases for new and high technologies, industry clusters with distinct features, pro-technology and pro-innovation public development platforms, public service platforms and public financing and investing platforms. National hi-tech zones have become important powerhouses that encourage the innovative and entrepreneurial spirits and activities. They have produced more than 13,000 companies with assets over 100 million yuan, about 18,000 tech-based enterprises, over 1,000 companies that are publicly traded in different stock exchanges in international financial centers, and, in 2012 alone, 65,000 newly registered business ventures. Among these enterprises that started in hi-tech zones, companies or groups, including Huawei, ZTE, Lenovo, Alibaba, Baidu, Tencent and Zoomlion, have risen to global prominence. Industry clusters with special features, for example, chip design in Beijing's Zhongguancun Hi-tech Zone, integrated circuit manufacturing in Shanghai's Zhangjiang, optical communications in Wuhan's East Lake and telecommunications in Gungdong's Shenzhen have developed into desirable scale and gained international competitiveness.

3. Adhering to scientific development to serve the economic restructuring and growth mode transition

National hi-tech zones have become a powerful contributor to the sustainable and robust expansion of the national economy. Drawing on China's national conditions, these zones break a new path of industrialization in China with the characteristics of intensiveness, high-efficiency and environmentally friendliness and lead the national effort in restructuring regional economy, transforming the approach to economic growth and sustaining sound and robust

development of the economy.

Contributions made by the national hi-tech zones to the overall economy increase year by year. In 2012, the zones collectively realized a total revenue of 16,596 billion yuan, an export earnings of \$ 376.04 billion which accounted for 18.4% of the national total export earnings. Tax revenues from these zones totaled over 968 billion yuan. Among all national hi-tech zones, 12 contributed over 30% of the total value of industrial output of the city in which they operate; 30 contributed more than 20%; and two hi-tech zones contributed more than 50%.

In national hi-tech zones, land resources are utilized intensively and efficiently. By land use efficiency, investment intensity and investment returns, these zones all dwarf other places in the country. Emerging industries including cultural creativity, R&D, outsourcing, health management are mushrooming in the zones, and technological achievements made in the fields of energy conservation and environmental protection are promptly translated into reality. Successful implementation of projects such as "Pilot Project of Electric Vehicles" (which plans to add 1,000 new-energy vehicles in 10 cities) respectively, "Pilot Projects of LED" (which set out to add 10,000 LED devices for lighting in 10 cities), "Golden Sun" (which promotes the demonstration of photovoltaic power generation), "Triple Play" (which aims at the functional convergence and information resources sharing of telecommunications network, broadcasting network and the internet), and "Smart City" have made the hi-tech zones national models.

4. Providing favorable environment for talents to foster an innovative business culture

Talents recruiting and utilizing systems and mechanisms are constantly improved in national hi-tech zones. Fresh technological talents are encouraged and guided to work in innovative and entrepreneurial endeavors, fostering the spirit and culture that incentivize innovation and entrepreneurship, which is special to the

national hi-tech zones. By establishing global personnel exchange platforms, the zones implement the strategy of high-level personnel international exchanges and kick off more than one hundred pieces of special policies and regulations that target international innovative and entrepreneurial talents. The majority of talents recruited under the national recruitment program of global experts come from national hi-tech zones, and 25 national zones are named “National High-Level Personnel Innovation Centers”. Within all national hi-tech zones, 1,725 experts are recruited into the Recruitment Program of Global Expert. By 2012, the zones employ 12,695 thousand people, among which 2,236 thousand engage in technological development, accounting for 17.6% of all employees. Of these employees, 51% hold diplomas at or higher than junior college, 558 thousand have master’s degrees, 63,000 have doctor’s degree and 82,000 are educated overseas. In 2012, national hi-tech zones employ 459,000 new college graduates, thus becoming a main absorber of the work force annually released from higher education institutions.

Along with the great achievements reached in terms of science and technology and economic and social development, the spirit of “innovation, entrepreneurship, dedication and excellence” is formed and embraced within the national hi-tech zones, and a culture of supporting innovation, encouraging entrepreneurship and relying on science and technology to create wealth, enrich people and empower the nation is also fostered.

The spirit and culture originated in these zones enable entrepreneurs with a strong sense of responsibility to the nation and the society to rise to excellence. This growing group of trailblazers and enterprises has formed the societal base of the national endeavor of innovation and development and the underpinning forces in the industrialization of new-and high-technologies in regions and cities.

Achievements made in the hi-tech zones during the two decades of their robust development attest to the successful industrial policies and the action plans made by the Chinese government against the background of reform and opening up. These achievements also display the roles played by science and technology in spurring development when integrated into local industrial development and their roles in motivating creativity in the science and technology community and entrepreneurship in the business community when accommodated to the national conditions. This is an example of creating a new possibility for emerging countries to gain industrial competitiveness in a timely fashion and the successful implementation of hi-tech zones is another great contribution to the system of theories and experience of building socialism with Chinese characteristics.

(Source: Torch High Technology Industry Development Center, Ministry of Science and Technology of the People’s Republic of China, Oct, 2013)

Zhongguancun Science Park

In May 1988, the State Council approved the establishment of Beijing New Technology Industry Development Experimentation Zone, which was also known as Zhongguancun Science Park, the first of such high technology parks in China. On March 13, 2009, by the approval from the State Council, “Zhongguancun

National Innovational Demonstration Zone” started building up on the previous basis of Zhongguancun Science Park, which would become a technological innovation hub with global influence. This zone was also China’s first national demonstration zone for home-grown innovation.

After two decades of development and construction, Zhongguancun is now home to nearly 20000 enterprises with outstanding brands such as Lenovo, Baidu, Capitalbio and Vimicro, etc. It boasts the high technology industrial clusters and sophisticated high-end modern service industry which is highlighted by six advantageous industrial clusters: next generation internet, mobile internet, new generation telecommunication, satellite technology, biotech and health, energy conservation and environmental protection; and four potentially promising industries that are integrated circuit, new materials, cutting-edge equipment and general aviation technology, new energy and new energy vehicles. The Zhongguancun zone consists of several different sub-parks, each of which has been built with a unique development pattern and distinct features. The zone has become a sophisticated industrial function area that covers multiple district jurisdictions.

Zhongguancun district is renowned for its intellectual and educational resources and talent pool that is superior to any other places in China. Located here are 41 higher education institutions such as the prestigious Tsinghua University and Peking University; 206 national and

municipal scientific research institutions, including some institutes affiliated to Chinese Academy of Sciences and Chinese Academy of Engineering; as well as 67 national key laboratories, 27 national engineering research centers, 28 national engineering technologies research centers, 26 university-sponsored science parks, and 34 entrepreneur parks for overseas Chinese scholars.

In 2012, Zhongguancun Demonstration Zone generated a total revenue of 2.5 trillion yuan, a 25% increase over the previous year. Value added in the new and high technology industries surpassed 360 billion yuan, contributing 20% of the GDP of Beijing city, one percentage point higher than that of the previous year. Tax revenues from the zone reached 150 billion yuan, up 60% over the previous year. The zone employs a total 1.56 million with 180,000 jobs added during the year; it delivers a profit of 173 billion yuan, with a year-on-year increase of 13%, an export revenue of \$23 billion, accounting for 40% of the total amount in Beijing. Science and technology spending from enterprises in the zone reached over 90 billion yuan, an increase of 25% over the previous year.

(Source: www.zgc.com.cn, Oct, 2013)

Wuhan East Lake High-tech Development Zone

Wuhan East Lake Hi-Tech Development Zone was established under the approval of the State Council in October 1988. In December 2009, the zone was further approved to become a national innovational demonstration zone(NIDZ), the second of its kind in China.

In this demonstration zone, four emerging industries were made focus of the development, which would become the examples of industrial development of other localities.

Photo-electronic information technology(IT)

industry: It is now an industrial leader in the country and a competitive player representing China in the international market. In optical communications, laser, consumer products, integrated circuits, and global geospatial information, enterprises in Wuhan East Lake(NIDZ) maintain a strong competitive edge over enterprises elsewhere in the country. In 2012, photo-electronic IT industry in the zone delivered a revenue of 192.7 billion yuan, a year-on-year increase of 32.92%, contributing 38.5% of the total revenue in the zone.

Bio-industry: In 2012, It realized a revenue of 40.11 billion yuan, an increase of 32.7% over the previous year, accounting for 8% of the revenue generated in the zone. Products, technologies and services in the six fields of bio-medicine, bio-agriculture, medical apparatus and instruments, bio-manufacturing, health service and bio-energy were vigorously developed.

Energy conservation and environmental protection industry: Revenue produced in this area was 65.4 billion yuan in 2012, an increase of 28.5% over the previous year, contributing 13% of the total revenues of the zone. Enabling conditions was been put in place where wind power generation, solar power generation, bio-mass energy and new energy powered vehicles are developed in

balance.

High-end equipment manufacturing industry: In 2012, revenues in this area registered 63.45 billion yuan, a year-on-year increase of 24.6%. The share of industrial revenues accounted for 12.6% of the total in the zone. High-speed vessels built there now take up a 70% share of the domestic market. The zone is now leading the world in the R&D of networked numerical control systems, and located here are some of the most important enterprises in the industry, such as Schneider Electric, Shantui, Optics Valley Machinery and Electric, Nari-GE, Sinopec Jiangnan Oilfield, Wuhan Boiler Company, and Wuhan Heavy Duty Machine Tool.

(Source: www.wehdz.gov.cn, Oct, 2013)

Xi'an High-tech Development Zone

Xi'an High-Tech Development Zone was approved to be established by the State Council in March 1991. Recently, the hi-tech zone makes efforts on developing new and high technology industries, creating a system of four dominating industries of electronic information, advanced manufacturing, bio-medicine and modern service and boosting eight industry clusters including telecommunications, photovoltaic and semiconductor lighting, electric power equipment, electric components and apparatus, automobiles, software and service outsourcing, bio-medicine and innovative service. The zone successively received the status of National Telecommunications New and High Technology Industrialization Base, National Bio-Medicine Torch Program Industrial Base and New and High Technology Products Export Innovation Base.

Telecommunication industry: Xi'an hi-tech zone is home to the Telecommunication Research Center incorporated by Intel, the largest designer and producer of integrated chip, a technical support center by Qualcomm,

the world's largest manufacturer of wireless chips and research and development and operation centers by handset makers RagenTek and Wintech. In recent years, the zone has formed a well-fledged telecommunication industry cluster that is represented by over 300 companies such as Huawei, ZTE, Digital China, Longcheer, Spreadtrum, Mobi, EVOC, Nokia, Siemens, Haitian Antenna, IWNCOMM and Yulong, and supported by NEC, Fujitsu and several Chinese research institutions. Particularly, with the accelerated commercialization of 3G technologies, Xi'an hi-tech zone is now becoming the second largest telecom industry base of the country.

Photovoltaic and LED industry: The zone saw the successive establishment of the semiconductor lighting research development and production center sponsored by GE, a Fortune Global Top 500 company, the solar and photovoltaic industry base invested by Shaanxi Photovoltaic Industry Co.Ltd, the Western China R&D Center and LED Products Manufacturing Center of Kingsun, the largest domestic LED products manufacturer,

and a 500MW silicon wafer production line developed by Fenghuo PV. Today, the zone is home to more than 80 companies, among which are Applied Materials, Walsin Lihwa, Huajing Electronics and Crystal Growing Technology. It has in place a complete solar energy and PV and semiconductor lighting industrial chains. In 2015, the solar energy and PV industry is projected to generate

100 billion yuan of operating revenue with more than three industry leading enterprises while the semiconductor lighting industry will deliver an operating income of 15 billion yuan and produce 5-10 industry leaders with core technologies and each of which with a total value of its output surpassing one billion yuan.

(Source: www.xdz.com.cn, Oct, 2013)

Baoding National Hi-tech Industrial Development Zone

In November 1992, the State Council approved the establishment of Baoding National Hi-tech Industrial Development Zone. The zone has built a new and hi-tech industry system featuring new energy and energy ancillary equipment manufacturing and supplemented by software, new materials, bio-medicine industries. In 2012, the zone-wide fixed asset investment was 10.17 billion yuan, a year-on-year increase of 2.6%. Revenues within the zone reached 3.08 billion, an increase of 19% over the previous year. The total value of industrial production of the zone was 85 billion and the paid-in capital amounted to \$ 29.23 million. By industrial output value, total income and total paid-in capital, the zone maintains a leading position in the city of Baoding.

By leveraging the advantages of the new energy and ancillary equipment industry cluster, the city

proposed in 2006 the strategy of developing itself into the “Electricity Valley of China”. Under the strategy, the city would rely on the hi-tech zone to create the platform for the strategic development of China’s new energy sector. Today, Baoding, the Electricity Valley of China, maintains a competitive edge in the six industry clusters of photoelectricity, wind power, electricity conservation, electricity storage, electricity transmission and transformation and electric automation. Among the 170 and more companies that nestle in the hi-tech zone are leaders in the industries of photoelectricity, wind power and electric transmission and transformation, for example, Yingli, Guodian United Power, Tianwei and AVIC Huiteng Wind Power Equipment, that mobilize the complete industrial chains of photoelectricity and wind power in the heart of China’s Electricity Valley.

(Source: www.bdgxq.gov.cn, Oct, 2013)

(Editor’s Note: All news in the issue are translated from Chinese texts for your reference. They are subject to checks and changes against official release of original Chinese or English texts.)