INNOVATIVE CITY IN WEST CHINA CHONGQING

Jon Sigurdson
Stockholm School of Economics, EIJS
Krystyna Palonka
Stockholm School of Economics, EIJS

Working Paper 239
February 2008

Postal address: P.O. Box 6501, S-113 83 Stockholm, Sweden
Office address: Holländargatan 30 Telephone: +46 8 736 93 60 Fax: +46 8 31 30 17
E-mail: japan@hhs.se Internet: http://www.hhs.se/eijs

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Abstract

This working paper offers insights on science and technology in China with supporting official and interview data. The paper, as evidenced from the title, is indicating the future role of Chongqing and its evolution primarily focusing on the period of rapid development of the Municipality after Chongqing became a political entity on the same level as provinces of China. This has coincided with the planning, construction and completion of the Three Gorges Dam Project involving the resettlement of 1,000,000 people – most them coming to the rural areas Chongqing Municipality. Three major sub-themes are highlighted.

First, the city played important role during more than 2000 years of its history (in 1981, for example it became first inland port in China open for foreign commerce). In the XX century Chongqing was national capital during the Second World War and the Japanese invasion (Nationalists government). Since than it enjoyed higher political status and economic independence than any other city of the same size in whole western China.

Second, the municipality's geographical position and demographic condition makes it quite unique in West China. It has a population of 31 million, an area of 82 square km, a population density of 379 persons per km2[2] and a location at the upper reaches of Chang (Yangtze) River. This makes it the gate of Southwest China.

Third, Chongqing has a strong basic multi-faced economy in the region. Central investment since the 1950s has assisted the development of a relatively strong modern industrial base in the city. Despite the post-Mao reform era's impact on social and economic disparities as between the coastal areas and the west, Chongqing remains one of the China's strongest city economies. Its industrial output value ranked 11th among the 35 biggest city economies in China in 2000, though it ranked behind the top ten most industrialized coastal cities, all of which had attracted much greater foreign investment during the reform era. The campaign to *Open up the West* provides Chongqing with the opportunity to act as the growth pole for a number of less industrialized provincial-level units in north-west and south-west China.

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[1] A first preliminary version of this paper was presented at the 2006 SSE-LSE-CCER Conference on "Economic Growth in China" within the theme, "China's Evolving System for Industrial Innovation".The underlying material has been used by the authors in a piece-meal fashion in a number of journal articles and book chapters.

[2] For comparison the whole Sichuan province has population of ca.85 million and density of 180 person per km^2.

Fourth, the initiatives by central authorities and the extraordinary task of Three Gorges Dam project required among other great tasks also relocation of over 1,2 million people, the rebuilding of two cities, eleven county towns and one hundred sixteen townships from the site of Three Gorges Dam water reservoir. Until 2005 there were already almost one million residents resettled. Less than 20 per cent moved outside Chongqing municipality and the majority was to be accommodated within the region of Chongqing Municipality.

Keywords: Regional development; clusters; Regional innovation System (RIS); Development block; competence block; technology system;; High Technology Parks; Overview of Science and Technology; FDI; (follow links to similar papers)

JEL-Codes: I18; I23; L53; O31; O32; R58;

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Introduction[3]

CHONGQING – HISTORY AND BACKGROUND

The municipality of Chongqing was officially established by central authorities of China in 1997. Chongqing City was merged with the neighboring Fuling, Wanxian, and Qianjiang that had been governed by Chongqing City on behalf of the province since September of the previous year. These four prefecture-level entities were all abolished as distinct administrative divisions and formed one new Chongqing Municipality., to spearhead China's effort to develop its western regions as well as to coordinate the resettlement of population from the Three Gorges Dam project. The first official ceremony took place on June 18 of that year. Thus, the site was excluded from the jurisdiction of Sichuan province and has got the status of province reporting directly to central government in Beijing.

Many factors – historical, geographical, economical and political affect the significant role the city played during the turbulent times of XX century. Below the most important factors are summarized in separate sections.

[3] We are greatly indebted to a large number of colleagues and friends in China who have enabled us to prepare this working paper on certain limited aspects on the evolution of Chongqing., close focusing on the rapid development of the Municipality after Chongqing became a political entity on the same leas the provinces of China. This has coincided with the planning, construction and completion of the Three Gorges Dam Project involvement of 1,000,000 people to be resettled – most them coming to Chongqing Municipality rural areas.

We are in particular grateful to Dr LI Tao, now serving as research director of the One China – Two Systems research unit in Hong Kong. While residing at Harvard University he introduced me to Dr Mu Huaping, Vice Secretary-General of the Chongqing's Municipal Government , who at the time of my field research introduced me to many organizations within the Municipality science and technology which enabled me to collect data and insights from almost any corner that I had time to visit during my limited ten days in the City.

Without offending those many who with great effort and intelligently supported and assisted us I would only mention a few of contacts of some 100 people during these intensive days in one of China's extremely rapidly expanding and still charming City. Thanks goes to staff and members of many organizations, including 1. S&T Commission 3. Jiaotong University4.Lifan and Silan & other companies.

1.Chongqing Municipality location in China

First comes the historical justification. The city played important role during more than 2000 years of its history (in 18981, for example it became first inland port in China open for foreign commerce). In XX century Chongqing was national capital during the Second World War and Japanese invasion (Nationalists government). Since than it enjoyed higher political status and economic independence then any other city of the same size in whole western China. After 1949 the city was still separately administered until 1954 when it was downgraded to a sub-provincial city in Sichuan province. From that time until 1997 Chongqing and Chengdu (capital of Sichuan) had very turbulent relationship. There was constant competition and Chengdu benefited from considerable subsidies of provincial government to improve its political and economic significance. The leaders of Chongqing expressed their feeling that the city development is scarified to support the capital of the province.[4] As a result the municipality "changed hands" in different times and as a matter of fact more often it was under direct administration of Beijing than Chengdu.

Second, the municipality's' geographical position and demographic condition makes it quite unique in West China. It has 31 million population, 82 square km area, population density of 379 people per km2[5] and location at the upper reaches of Chang (Yangtze) River. This makes it the gate of Southwest China on the water route and major site of transport since the airport connects the city with over 50 destinations in China and other parts of the world. The city itself with metropolitan area population of ca. 4 million people is a closest administrative centre to the world's biggest construction site-Three Gorges Dam (TGD). Chongqing Municipality territory includes most of previous east Sichuan province and its establishment is specifically justified by special requirements of TGD project.

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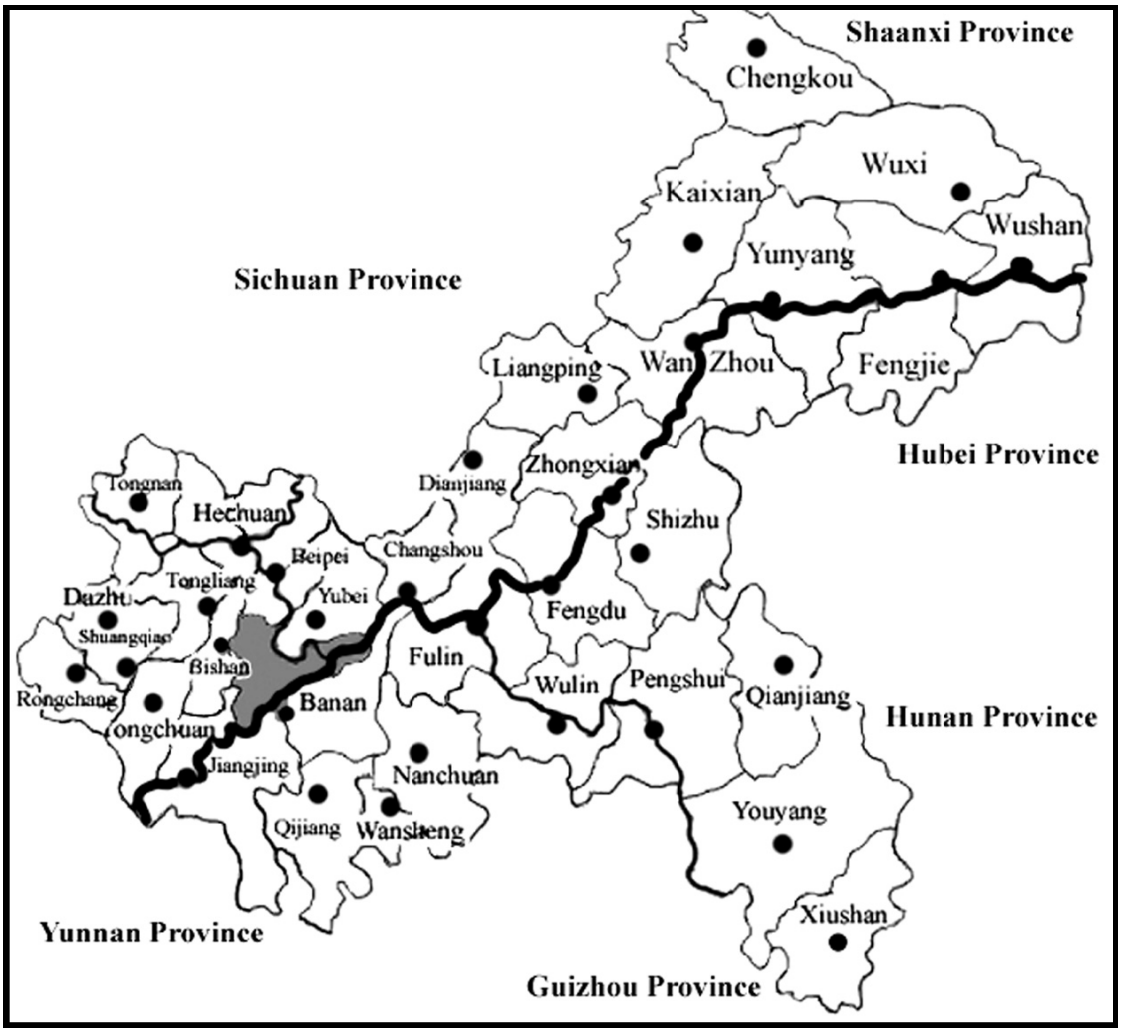
[4] In early 1959s the industrial output of Chongqing exceeded about 5 times that of Chengdu while in middle 1990s Chengdu had exceeded Chongqing by 18,2 billion yuan. For a more details of Chongqing and its history, see Lijian Hong, "A tale of two cities: a comparative study of the political and economic development in Chengdu and Chongqing," in Jae Ho Chung (ed.), Cities in China: Recipes for Economic Development in the Reform Era (London: Routledge Studies on China in Transition, 1999), pp. 183–214; Lijian Hong, "New Chongqing: opportunities and challenges," in John Fitzgerald (ed.), Rethinking China's Provinces (London: Routledge, 2002), pp. 41–88; and Jianfu Chen and Lijian Hong, China Focus – Centrally Administered Municipalities (Singapore: CCH Asia PTE Limited, 2001), pp. 157–177.

[5] For comparison the whole Sichuan province has a population of ca.85 million and a density of 180 persons per km2.

Third comes the complex economy of the region. Central investment since the 1950s has assisted the development of a relatively strong modern industrial base in the city. Despite the post-Mao reform era's impact on social and economic disparities as between the coastal areas and the west, Chongqing remains one of the PRC's strongest city economies. Its industrial output value ranked 11th among the 35 biggest city economies in China in 2000, though it ranked behind the top ten most industrialized coastal cities, all of which had attracted much greater foreign investment during the reform era. The campaign to open up the West provides Chongqing with the opportunity to act as the growth pole for a number of less industrialized provincial-level units in north-west and south-west China. In addition its role in the west will create a policy difference with cities in central and east China that it may exploit to obtain central investment and even possibly to attract foreign investment. Still there are densely populated, agricultural areas, huge amount of inefficient SOEs, and high unemployment with generally poor economic performance. It posed a challenge for local and central authorities. The biggest task however is the relocation of huge amount of population from TGD reservoir.



1. Chongqing Municipality map

Furthermore, the political strategies such as the campaign ”Open Up the West” initiated by central authorities and the extraordinary task of Three Gorges Dam project required among others relocation of over 1,2 million people, the rebuilding of two cities, eleven county towns and one hundred sixteen townships from the site of Three Gorges Dam water reservoir. Until 2005 there were already 943 576 residents resettled of them ca. 643 thousands of urban and ca. 300 thousands of rural population. Only 1some 130 thousands of resettled citizens moved outside Chongqing municipality. The remaining re-settlers were to be accommodated within the region.[6]

These responsibilities loaded onto Chongqing have been followed by frequent demonstrations of underpaid or laid-off SOE workers and general poverty of agriculture population. To govern these enormous tasks required and still requires skilled and *in situ* made decisions, with rigorous logistics and massive material resources.

The combination of above factors and the scale of undergoing transformation deliver an extraordinary and exciting research area .Leadership and relations with central authorities, sponsoring by central, foreign and internal resources, articulation and accomplishment of economic and social policies are major issues to comprehend. However the authorities of Chongqing Municipality have undertaken more far reaching strategic tasks. They aim to make a province one of the most modern economy and best educated society.

Industrial Structure of Chongqing Municipality

In the first few years after Chongqing became independent from Sichuan its economic performance was rather disappointing. Statistics show that local SOEs continued to deteriorate after several years of making losses. In 1997, for example, 44.3 per cent of the largest SOEs and 55.5 per cent of the state-controlled shareholding enterprises suffered a total loss of 2.63 billion Yuan. In 1999, the largest SOEs alone had alarmingly high losses of 1.9 billion Yuan. Meanwhile, the poor economic performance of the SOEs led to a rapidly growing number of laid-off workers. From 1997 to 1998 the number of people who received relief subsidies in urban areas jumped from 68,753 to 159,504. In the rural areas, due to a serious drought, relief fund receivers increased dramatically from 547,649 in 1997 to 1,198,821 in 1998. Urban residents became accustomed to frequent demonstrations by laid-off workers from SOEs. Despite initial expectations, utilized foreign investment decreased from US$982 million in 1997 to only US$327 million in 1999. Total foreign exchange earnings from international tourists dropped from US$105.48 million in 1997 to US$97.26 million in 1999. Exports to South-East Asia were affected by the Asian economic crisis 1997 and sharply decreased from US$780 million to US$490 million over the same period.[7]

Central investment since the 1950s has assisted the development of a relatively strong modern industrial base in the city. Despite the post-Mao reform era’s impact on social and economic disparities as between the coastal areas and the west, Chongqing

[6] Resettlement of Chongqing Reservoir Area of Three Gorges Project; China Three Gorges Project, http://www.ctgpc.com/

[7] China Daily Online,20 February 1997; “Chongqing to become another powerhouse,” 7 March 1997, www.chinadaily.com.cn .

remains one of the PRC's strongest city economies. Its industrial output value ranked 11th among the 35 biggest city economies in China in 2000, though it ranked behind the top ten most industrialized coastal cities, all of which had attracted much greater foreign investment during the reform era.

It has been difficult to convince foreign investors to make investment in an inland city more than a thousand kilometres away from the coastline; it may often have been more realistic to seek funds from the central government. This is what Chongqing expected would happen when it became a provincial-level municipality anyway. Indeed, when Beijing restructured the Chongqing leadership, the two new leaders came with a large earmarked investment from the central government. In the government work report of 2000, Mayor Bao Xuding disclosed that in 1999 the central government provided Chongqing with 3.68 billion Yuan from state treasury bonds, or 40.9 per cent of Chongqing's budgetary revenue that year, to support government-sponsored projects. In 2000, central payment transfer through state treasury bonds increased to 6.5 billion Yuan, or 61.9 per cent of the municipal budgetary revenue in that year.

According to the municipal Party secretary, He Guoqiang, between 1999 and 2002 central government provided Chongqing with a total of 16 billion Yuan from its state treasury Bonds.17 Bao Xuding claimed that with these central funds invested in key projects, an additional 100 billion Yuan or more was attracted into infrastructure, construction, and ecological protection projects. In addition, Beijing has invested sizeable government funds in the relocation programme for the Three Gorges [8]

It was believed that by 2002, a total of 31.55 billion Yuan had been provided to Chongqing for the relocation programme.

Development Priorities and Instruments

Chongqing sought funds for its development by attempting to implement its own internal unbalanced growth strategy. This permitted and indeed encouraged the former Chongqing city area to develop first while at the same time trying to restrain the urgent demands for development in other parts of the new municipality, at least for a certain length of time. It was evident that Chongqing Municipality to concentrate its limited available resources in the more developed areas. In his first government work report, Mayor Bao divided new Chongqing into three economic development zones, each with a different development strategy. In his second government work report, Bao presented a detailed plan for these three economic zones. The first would be the Advanced Metropolitan Economic Zone in the old Chongqing area which would function as the economic, trade and financial centre for the new municipality. This, it was seen, would concentrate development in the areas of scientific and technologic research, education and cultural life. The second was to be the West Chongqing Economic Corridor Zone which would link Chongqing with a number of economically advanced cities in Sichuan along the Chengdu–Chongqing railway. The third was the Three Gorges Ecological Economic Zone, where Chongqing would use central investment to build up a new environmentally friendly economy within the

[8] People's Daily Online,21 June 2002, www.unn.com.cn/GB/channel204/

Three Gorges Reservoir area. Among these three zones, the municipal government would pay particular attention to the building of the New North District within Chongqing's CBD.

With substantial scientific & technological strength, Chongqing has become a commercial and industrial center in southwest China. It has 40 institutions of higher learning, 11 institutions for adult learning and 3 military academies in Chongqing, among which Chongqing University, the Third Military Medical. University, Southwest University (formerly called Southwest Normal University). Southwest Agriculture University and Southwest University of Political Science and Law have become influential and famous in China. There are 700,000 professionals in the educational sector, among which there are 10 academicians and over 60,000 technicians who are directly working on research and development. Among the 74 scientific research institutions, with 16 of them directly under the central government, and 58 are under the leadership of Chongqing municipal government.

In 2007 there existed within the educational sector in Chongqing, 17 key subjects of national-level, 54 post-doctoral working stations, 85 key laboratories on different subjects. Two of them are of national level, one is at the provincial level and another 12 at municipal level

There are 23 engineering and research centers, three of which are of national level with the remaining 20 are at municipal level. In the industrial sector there are over 78 enterprise technological centers, 22 different enterprise incubators and more than 1,000 scientific and technological intermediary institutions.

Chongqing scores significant scientific and technological achievements each year. Chongqing researchers successfully made the draft map of the silkworm genome – following up on another two research programs – the human genome and the paddy rice genome. These achievements were published in the SCIENCE journal. The System of Tumor Therapy by JC Ultrasonic Focus, large-size medical instrument with self-intellectual property rights, was developed in Chongqing and has been exported to Britain and Japan among other countries. The industrialization and application Mg-alloy in Chongqing play the leading role in China being used increasingly in vehicle engines

Official reports mention that there exist about 3,000 privately-run scientific and technologica1 enterprises, with around 120,000 staff, among which nearly 50,000 have at least diploma from po1ytechnic schools. In recent years, with improvement of the comprehensive system of scientific and technological policies, capital venture and financing, a series of regulations and policies have been taken into enforcement, such as "Regulation of S & T Investment of Chongqing", "Regulations of S & T Transformation", "Rules of Promoting Hi- tech Industria1ization", "Decision of Optimization of the Talents", for the purpose of, providing a good macro-environment for the deve1opment of science and technology of Chongqing.

Since Chongqing became the municipality directly under the Central Government, the science and technology activities in Chongqing were are out under the policy of "Developing Hi-tech projects and accelerating industrialization". Strong leading roles were organized and implemented targeting at a constructing high& new technical

industrialized base in upper reaches of Yangtze River. High & new technical candidates in electronic information, biology & medicine, environment protection and new material fields, etc. haven “incubated” to accelerate the optimization of economic structure in Chongqing.

Electronics and Information Technology

In electronics and information industry greatly supported were research and industrialization of MEMS apparatus and micro system, TD-SCDMA mobile phone base-band chip 'design and protocol software development and industrialization, analog IC key technique research & industrialization, new-generation internet key technique research & industrialization, width-band radio input key technique research and products development, development and industrialization of digital entertainment products, digital documentation resource construction & utilization, development and industrialization of embedded-system for automobile and instrument industries, manufacturing information application software, CAX/PDM/ERP multiple-system integrated technical development and application, development and application of E-commerce platform and medium development and application of ITS technology.

Biomedicine

In the biomedicine technology, Chongqing has the potential ability of research and industrial exploitation. During the 10^{th} Five-Year-Plan, there were a total of 805 items in the field of social development, which are supported by science and technology project, including 478 items of medicine-hygiene and medical instrumentation. All the projects, through tackling key problems and demonstrating activities in science and technology, have played a great part in improving significantly the social and economic development of Chongqing. The exploitation in focus ultrasonic wave tumor therapy system, focus ultrasonic wave gynecological therapy system, wireless intelligence medical pill, remote intelligence electrocardiogram monitoring system, bio-artificial liver supporting system, vaccine of viral hepatitis B, vaccine of human campylobacter pylori, restructured hypothyroid therapy, awe to reproduction technology and research, etc. have proved to be efficient and meanwhile Chongqing acquired advanced visibility in international circles.

Environment Protection

According to the requirements of "21st Century Agenda, China", the strategy of sustainable development is being enacted and implemented mainly in fume desulphurization project, clean energy project, renewable energy project, atmosphere pollution enterprises close /resettlement/ innovation project, moving pollution source control project, etc. Chongqing has mainly supported CNG vehicle technique research & industrialization, high-efficient & low-consumption sewage treatment technology, fume desulphurization technology, environment protection equipment development, etc Chongqing was "listed as the "Clean Energy Demonstration Cities;' authorized by Ministry of Science and Technology. The implementation of a project of urban garbage treatment technology involves Chongqing has also incubated and developed environment protection industry.

Traditional Industry moving into High & New Technology

After becoming municipa1ity directly under the Central Government, Chongqing has carried out policies if incubating high & new technical industrialization candidates

and use high & new technique to upgrade traditional industries, thus to accelerate adjustment and upgrading industrial structure. In the mean time of developing high & new technique guided industries such as electronic information project, environment protection project, etc., high & new technique and advanced applicable technique were adopted to innovate and upgrade key technique in mechanical, metallurgical, light industrial, textile and manufacturing industrials, and positively develop low pollution and high employment urban industries. In new material application, targeting at improving technical level of manufacturing in Chongqing, we supported "Vehicle Large AI-alloy Process Line: R&D Project" by West AI-Alloy Plant, research and application development of LED.

The application of Mg-alloy in automobile & motorcycle industries has obvious roles in adding value to automobile & motorcycles as well as market exploring, it has played important role in upgrading technique of supporting industries of Chongqing, such as automobile and motorcycles. In instruments research, we mainly supported over 20 S & T and R& D projects like site bust line control system, intellectual valve positioner, intellectual flow meter, virtual instruments and gauges, etc, which had improved the integral competitiveness of instrument and gauges industry. The application of important and key techniques such as automatic control technique, photo-mechanical-electric integration technique, intelligent robot technique, numeric control technique fuzzy control technique, high efficiency & energy saving technique, laser rapid forming tooling technique and clean production technique, etc. accelerated high & new technique innovation in Chongqing as well as upgrading of the traditional industries.

Modernizing Agriculture

The researches on the following subjects play a domestic and international leading role, they are completion of the draft map of the silkworm genome and research on silkworm function genome, quality hybrid rice series for high temperature and dry areas, Yunuo corn series, quality yellow-seed cole, crossbreed preserved Sichuan pickle, fengjie late ripeness oranges, artificial triploid mulberry, odd male silkworm cultivation, variety breeding and development of natural color cocoon, biological pesticide, research and new product development of traditional Chinese animal medicine, collection, storage, evaluation and utilization of orange species, orange quality gene sources excavation and molecule breeding, and orange virus and diseases.

Numerous scientific research achievements have been extended in Chongqing city and even the whole country over large areas, which have generated remarkable social economic benefit, and have also promoted the transformation from traditional agriculture to modem agriculture and agricultural industry structure adjustment. For instance, No.7 corn of Yunuo has been popularized over 1 million mus in Southern 16 provinces and cities, which has increased the income of 1.5 billion Yuan; and Qseries of hybrid rice seeds sale 10 million kg in domestic and international market.

Civilian Application of Military Technology

In 1999, in order to implement the West China Exploitation and Development Strategy, enhance the economic and technological exchange and cooperation among regions, the first hi-tech fair was jointly hosted by the Commission of Science, Technology and Industry for National Defense, Chinese Association of Invention and

Chongqing Municipal Government. Since the second fair in 2001, the Ministry of Science and Technology and China Academy of Sciences had become the formal sponsors from the 5th fair in 2003, the 1st C!1ina International Expo for Civilian Application of Military Technology was jointly held at the same time along with the hi-tech fair. Since then, China Chongqing Hi-tech Fair has a new name: China Chongqing Hi-tech Fair & China International Expo for Civilian Application of Military Technology which will be held every two years.

The Ministry of Science and Technology and the Commission of Science, Technology and Industry for National Defense etc. the five sponsors and the eleven military groups such as the General Staff Department, PLA, China Ordnance Equipment Group Corporation, the Chinese Nuclear Industry Construction Group Company and China Aerospace Science and Technology Corporation (CASC) attach great importance to .the fair, they regard the fair as an important platform to enhance the west development strategy and speed up the cooperation between the military and the civilian fields, so they came to attend the fair every year with a large number of hi-tech projects. Some western provinces such as Yunan, Guizhou, Sichuan and Guangxi took part in the fair with their enterprise purchasing groups yearly. As an ideal technology purchasing place, some relatively developed provinces like Beijing, Fujian, Guangdong, Zhejiang and Shandong etc. took an active part in the fair. Delegations from some foreign countries, world top 500 enterprises and some universities exhibited their latest products and technologies at the fair, including delegations from Russia, Germany, Canada and Japan; enterprises like Motorola, Ericsson, China Telecommunication, China Putian Corporation, Lenovo China (The Association Group Limited Company) and China FAW Group Corporation and some universities like National University of Defense Technology, Beijing Aerospace University and Beijing Technical University and so on.

Along with different kinds of activities like business talks, special topic forum, theme event and global purchasing activity, China Chongqing Hi-tech Fair & China International Expo for Civilian Application of Military Technology highlight high and new technology and military & civilian dual use technology feature and lay a trade platform for scientific research institutes and enterprises.

International Scientific & Technological Cooperation

In light with the municipal overall strategy of development, the work in Chongqing science and technology is playing a more and more important role both as a guide and a bridge and provide efficient services for the development of social economy. A new pattern of international scientific and technological cooperation is gradually taking shape in a wide range, on multiple dimensions and on different levels among enterprises, universities and research institutions.

Up till 2005, Chongqing had sent 2300 people to foreign countries for the purpose of technical visit, training and attending conferences. In return Chongqing had also hosted 200 S&T delegations with over 2500 guests from USA, Japan, Russia, Britain, France, Canada, Germany and Australia. Chongqing has accelerated its step in developing international cooperation with different countries in various areas.

Chongqing is making efforts to establish and keep long-term stable cooperation relations with governments, enterprises, scientific research institutes, universities and

international organizations on the basis of Equality, Mutual Benefits, Sharing of Achievements, Protection Intellectura1 Properties Rights and Compliance of International Practices."

Structure of Chongqing Science and Technology System (CSTS)

Under the Municipal Government of Chongqing are the 29 functional departments which are corresponding to those of the State. All the government departments not only do their job, unite coordination and make their jobs known to the public, but also support each other and are both diligent and highly efficient. They endeavor to contribute to the development of the local economy.

Chongqing Science and Technology Commission

Chongqing Science and Technology Commission, one of the functional departments of the municipal, is responsible mainly for the scientific management. Its competent superior department is Ministry of Science and Technology of the State. Its main responsibilities are the following:

The Commission carries out the general and specific policies of the Party and the State, and implements the State's scientific laws and statutes. It drafts the local proposals and the government regulations, and it supervises and checks their implementation. Another function of the Commission is to study and formulate the macro strategies to develop the city's science and technology, and the general and specific policies fox the science and technology to promote the development of the society and economy. It also evaluates some major issues associated with science and technology to promote the development of the economy and society, and determines the major layout of the scientific development and the fields of preferential development. In addition, the Commission plans as a whole and coordinates the initiative cultivation on Science and Technology.

The Commission arranges and carries out the construction of major labs, technical research centers and other scientific basis. It is also in charge of all-level examination of the hi-tech projects, and it involves itself in the scope of hi-tech industrialization projects, commercialization the relevant construction of scientific base. The Commission takes responsibility for planning, guiding and coordinating hi-tech industrialization districts, university science parks on the one hand. On the other hand it is also responsible for approving hi-tech enterprises and hi-tech products, and technical personnel and scientific delegations going abroad for further education and scientific investigation.

Chongqing Development and Planning Commission

As one of the government functional departments, it is mainly in charge of the development bf the city's economy and society, and carries out the regional regulations and management. Its obligation with respect of science and technology is as follows:

The Commission organizes to formulate scientific development strategies, makes the mid-term and long-term plans and annual plans for the city's scientific development

and hi-tech industrialization development. It involves itself in balancing the scientific investment in the plan of the city's national economy and the development of society. Another obligation of the Commission is to organize the authentication, examination and approval of the hi-tech industrialization projects, and to organize the implementation of projects and coordinate the relevant issues. It edits reports and manages the special major projects of the State's hi-tech industrialization development and the major model projects. It also examines and approves projects to tackle key technologies and projects to construct hi-tech industrialization engineering centers. The Commission is to take the routine work of Chongqing Hi- tech Industrialization Office and to examine, approve and manage the fundamental construction projects of scientific basic facilities.

Chongqing Economic Commission

AS one of the functional departments, Chongqing Economic Commission has the following obligations involving the scientific fields:

It makes policies, local laws and measures for enterprises' technical progress, technical initiation, technology introduction and the major nationalized equipments. It also organizes and promotes technical initiation, and guides the establishment of the enterprises' technical initiation mechanism. Another obligation of the Commission is to organize the work to plan the key technical initiation projects, introduce the technology digestion and absorption procedures, new product trial production regulations, key technical equipment projects, and to apply for the State projects. It guides and promotes the combination of production, learning and research, and hi-tech industrialization. It also guides the construction of enterprises' technical centers and the development of new products and new technology, and their promotion and application. The Commission guides and coordinates the developments of major technical equipments and exchanges technology with foreign countries.

Chongqing Foreign Trade and Economic Relations Commission

It is one of the functional departments of the Municipal Government to administrate the city's foreign economic and trade cooperation. Its obligations relating to the scientific fields are as follows:

The Commission formulates and implements the development strategy of promoting trade by science and technology, the plan of scientific development in foreign trade, the administrative procedures and the annual targets. It provides guidance for the hi-tech enterprises to export their products, as well as the construction of an export base, so as to promote the traditional export industries for both hi-tech products and technology reform. It guides the introduction of hi-tech and promotes the multilateral and bilateral industrious-technical cooperation. It safeguards all the technologies that are not permitted for the export or re-export. It also examines and administrates delegations for overseas visits and organizes contracts for the import and export of technical projects. Its job also includes organizing and coordinating enterprises to enter the international markets. It is in charge of the research of technical on technical trade barriers and takes measures for foreign trade barriers and establishes technical trade protection systems. It is also responsible for setting up and improving the coordination mechanism of "scientific trade" in order to promote the integration of science and trade, technology and trade, industry and trade and to promote jointly the export of hi-tech products.

Despite the overlap of the functions for the different departments, they share out the work and help one another, cooperate closely, support each other in the spirit of being responsible for the overall program of the Municipality. They have the same goal to serve for the construction of Chongqing economy.

State-level Development Zones and University Science Parks

Chongqing Hi-tech Industry Development Zone

Approved by the State Council in March, 1991, Chongqing High-tech Industry Development Zone was established and became one of the first groups of such zones at national level, and was ranked as one of the five Experimental Development Zones for Comprehensive Reform by the Ministry of Science and Technology and the State Commission of Restructuring the Economic System. As the base for Chongqing hi-tech industry and up-grading of the traditional industry base, the Zone has become the increasing pole of the municipal economic development and the focal point of the metropolis economy. Till the end of 2005, approximately 5000 enterprises have registered here, among which 400 are authorized hi-tech enterprises and over 400 are overseas funded enterprises with investment from USA, Japan, Germany, France, Italy, Singapore, Hong Kong, Taiwan, etc. Industry systems involving in electronic information, biological pharmacy, new materials, and electro-mechanical integration with own property rights have taken shape. Moreover, Biology and Bio-chemistry Pharmacy Technology Development Park, Software Incubation Park and Overseas Returnees' Business Park have been set up. As the hi-tech industrial development base of Chongqing, the Hi-tech Industry Development Zone focuses on four industries, namely electronic information, biologic & bio-chemical pharmacy and medical instruments, new materials and automobiles and motorcycles components. The Zone is divided into three parts, namely Shiqiaopu Hi-tech Development Park, Hi-tech Development Park of New North Zone and Erlang New Scientific and Technological Town.

As the first development area of the Zone, Shiqiaopu Hi-tech Development Park covers an area of 2.5 km^2. It has 12 standard workshops with a total area of 150,000 m^2, hi-tech incubation buildings with an area of 100,000 m^2, 13 commercial banks, 6 luxury hotels, 13 various schools and complementary facilities including residential areas, parks, exhibition centers, hospitals and restaurants.

The Hi-tech Development Park of New North Zone which is located at the south tip of Northern New District covers a total area of 130 km^2. It started construction in April 2001 and is the largest expansion area of Chongqing Hi-tech Industry Development Zone. In the light of the general planning, four industrial bases will be set up respectively which will be engaged in optical electronics, software, medical appliance and new materials. In the future, the central business area, consulate area and traffic & communication hub will be built up in the Park.

As the expansion area of Chongqing Hi-tech Zone and one of the ten important projects of Chongqing for the Western Development Strategy, Erlang New Scientific & Technological Town covers an area of 10 km^2 with a total investment of 40 billion RMB. Since 2000, the main framework of the trunk roads has been set up and over ten projects including such projects as GREE and Century Jing Xin have entered the

Town. In an attempt to keep the Town as an environment-oriented industrial park as well as an ideal residential area, the management principle must be strictly followed that only projects with low pollution, low consumption and high efficiency will be encouraged.

The Hi-tech Industry Development Zone will focus on the construction of three industry bases, namely optical electronics, biological pharmacy and medical appliance industry. It will mainly cultivate four pillar industries. They are electronic information, biological pharmacy, new materials and electro-mechanical integration. And the Zone will build up five special incubation parks respectively involved in Overseas Returnees Business Park, Software Incubation Park, Biology and Bio-chemistry Pharmacy Technology Development Park, Optical-electronic Technology Development Park and Electro-mechanical Integration Technology Development Park. By the year of 2005, the total income from technology industry and trade of the Zone is expected to reach 60 billion RMB and 120 billion RMB in 2010.

Chongqing Economic and Technological Development Zone

Chongqing Economic & Technological Development Zone (CETZ) was approved by the State Council in 1993, and then became the first State-level Economic and Technological Development Zone in Western China. By the end of 2005, the CETZ had approved the establishment of 411 foreign-funded enterprises from 22 countries and regions, the amount of investment totaled 2.47 billion USD, the contractual foreign investment reached 924 million USD and the actual investment reached 828 million USD. 11 world top 500 enterprises such as Ford, Ericsson, Metro, and Honda have been set up here in succession, among which there were 46 projects with the investment above 10 million USD. In 2004, the total revenue reached 27.2 billion RMB, an increase of 52% compared with that of last year. GDP totaled 7.7 billion RMB, an increase of 45%. The total industrial output value amounted to 21 billion RMB, an increase of 65%. The tax revenue reached 1.6 billion RMB, an increase of 6%. The total amount of import and export reached 600 million USD, among which the amount of export accounts for 73 million.

CETZ is divided into the Southern Area and the Northern Area. The Southern Area, with its convenient transportation, is located in Nanping of Nanan District and occupies 9.6 square kilometers for its layout. It includes five areas which are Information Industrial Area, Dangui Industrial Area, Huilong Industrial Area, Comprehensive Trading Area, Nanhu and Luochangwan Residential Area. The Northern Area, with a planned area about 83.7 square kilometers and bordering the Jiangbei International Airport, is located in two towns, i.e. Yuanyang and Lijia of Chongqing New North Zone (CNNZ). It consists of Export Processing Zone, Automobile Industrial Park, Science & Technology Industrial Park, Environmental Protection Industrial Park and Central Business Center.

With 12 years' development, six mainstay industries have taken shape in both Southern and Northern Areas, i.e. electronics and IT, biomedicine, automobiles and motorcycles, fine chemical industry, new materials, green foodstuff, apparel etc. It is predicted that the total industrial output value will reach 24 billion RMB by the year of 2005, 48 billion RMB by the year of 2007, and 80 billion RMB by the year of 2010.

Chongqing New North Zone

Established on April 25, 2001, Chongqing New North Zone is located in the north part of Chongqing main downtown, with an area of 136 square km and a planned population of 0.65 million. It is the only area in west China that enjoys a comprehensive transportation network including highways, railways, waterways and airways. The Zone is close to the big airport which handles 120 million persons and 1 million tons of freight. Within the Zone is the biggest container harbor on the upper Yangtze River, which handles up to 900 thousand standard-size containers. Moreover, the biggest passenger railway station is located in the Zone, and the west crisscross highway networks planned by the Chinese Government converge there as well.

The New Zone is divided into the Hi-tech Park and Economy Development Park. The former attaches importance to the construction of Chongqing's optical electronics industry, software, and medical. apparatus and new materials industry, and the latter focuses on developing export, processing, auto industry, environmental protection, science and technology industry and central business. Chongqing foreign Embassies will be set up within the New Zone.

The New Zone focuses on developing "Auto City" of about 40 square kilometers and hi-tech real estate industrial base of about several hundreds square meters and it will greatly develop such hi-tech industries as auto, electronic information, new medicine, new materials, environmental protection and electro-mechanical integration. The New Zone will also concentrate on building a public landscape area of about 20 kilometers long along the Jialing River.

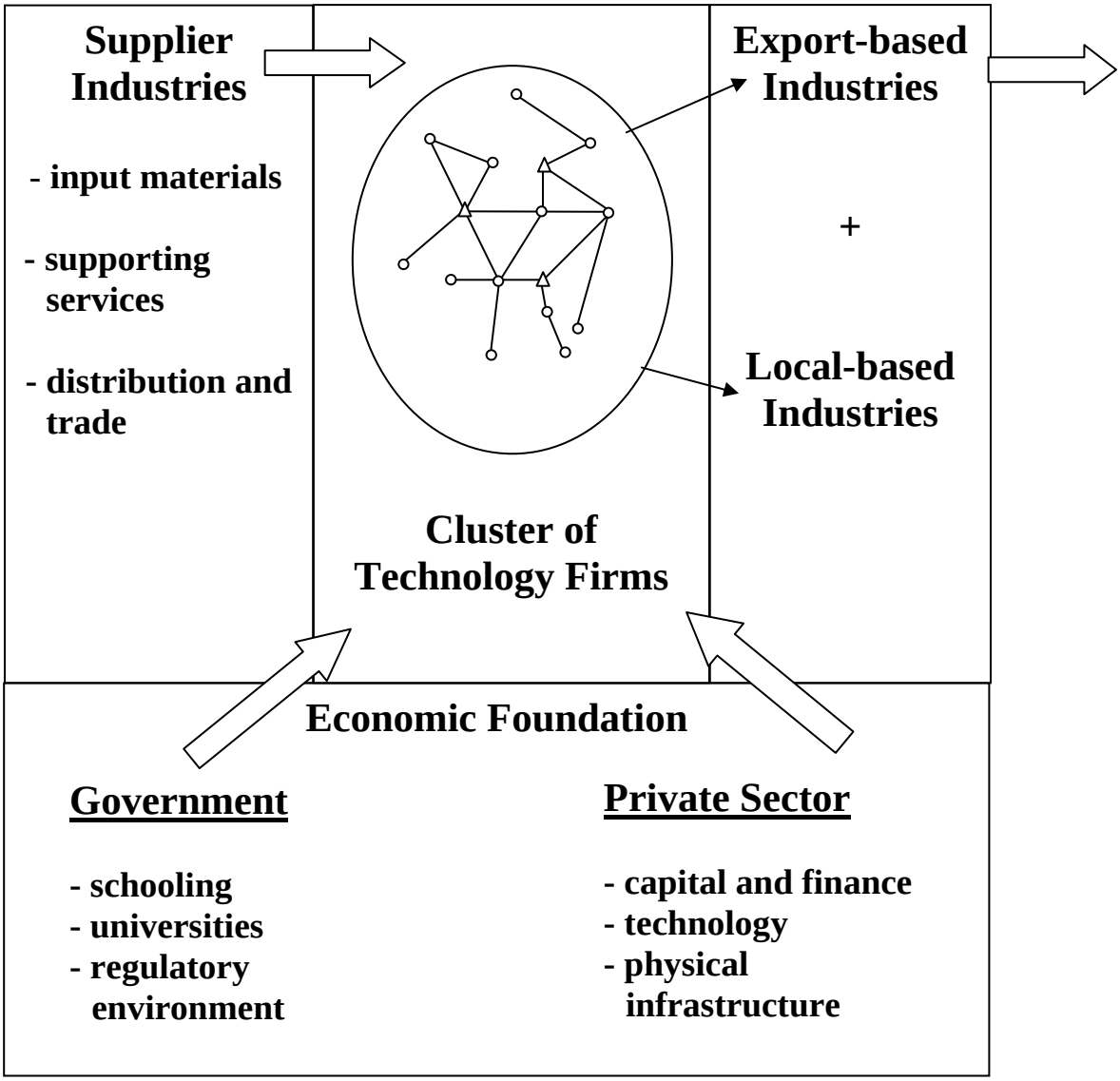
The New Zone benefits from the preferential policies formulated by the central government regarding economy and technology development zones, hi-tech industry development zones and the zone has also been given special preference by Chongqing municipal government in many fields. As a result, several dozens of world top 500 enterprises and MNC, like Changan-Ford Auto Ltd., Coca Cola have already set foot within the New Zone. Until October 2005, 464 projects have been successfully introduced to the New Zone; the total contract investment amounted to RMB 46 billion Yuan. By 2010, the New Zone will be built into a modem industrial base aimed at hi-tech industries. It also serves as a core growth pole for highly-developed metropolitan economy and demonstration of metropolitan landscape.

University Science Parks in Chongqing

University Science Parks in Chongqing consists of two Science parks, which are Chongqing University Science Park (CUSP) and Beipei University Science Park (BUSP). In May, 2001, approved by the Ministry of Science and Technology and the Ministry of Education, Chongqing University Science Park officially became one of the first 22 state-level university Science parks. On June 29, CUSP came into being. In 2002, BUSP was also approved by both the Ministry of Science and Technology and the Ministry of Education to build the national university Science Park. By the end of 2004, an area of 83,000 square meters incubating site in CUSP went into operation, nearly 209 enterprises began their business in the park. In 2004 the sale income reached 1.12 billion RMB, an increase of 50%. Enterprises with self intellectual property rights and key competence have grown up in the park. BUSP started to be built by Southwest University and Beipei District People's Government

in May, 2005 with an area of 17,000 square meters and one comprehensive incubating building with 92 enterprises inside.

CLUSTER STRUCTURE



Understanding Chongqing as an Innovative City

Profile of Chongqing IT industry – assessment of development

Thanks to the support from the national policy and the municipal government over the past few years, considerable progresses have been made for IT industry of Chongqing. Now, electronic information industry has become one of 3 leading industries in the prioritized development in the city. There exists a strong basis for mobile communications.

The city claims that in Chongqing the first TD-SCDMA 3G mobile phone was produced – in the world. Chongqing, the biggest comprehensive instrumentation industrial base in China, has create an initial shape in such 4 advantageous fields as electronic component (including intelligent instrumentation, wire and cable), software, consumables(including household electrical appliance), communication, which incomes of sales account for 93 % across the sector.

There are 53 leading enterprises in the whole sector with incomes of sales more than 50 million Yuan, accounting for 92.2% of sale incomes in the whole sector, - 10 more than in the preceding year.

Chongqing is one of the 6 biggest telecommunication switching centers in China. It possesses the first-class IT infrastructures in the world, which outlet band-width of communication network is bigger than 10G (expansion to 400G max) and posts and telecommunications can travel to more than 180 counties and regions. In 2002, the state informatization assessment showed that informatization level in Chongqing ranked at the 10th position in the country and 2nd in the west.

In 2005, the total amount of telephone users across the city has exceeded 18 million and density rate of telephone is more than 60%. Telecommunication and optical fiber for radio and television cover all towns and nearly 95% administrative villages across the municipality. Particular video conferencing, broad band IP comprehensive business and ATM data-based network platform have been built. Chongqing Internet Switching Center has been built and put into operation and internet users are expected to surpass 2 million in the year. The first IPv6-based city area network in the country is built by taking active part in the development of pilot application based on new technology. At present a multi-function, multi-medium, three-dimensional, informatization-oriented modernized network has taken shape, which covers the whole city, mainly relying on optical fiber cable and is assisted by digital microwave, combining digitalization transmission and stored program control switching.

The strategic target of the development of Chongqing IT industry

The target of the development of Chongqing IT industry is defined as follows: During the ongoing "Eleventh Five-Year Plan", our IT industry will develop rapidly and remarkably due to the implementation of "1162" project:

- The annual sales will achieve 100-150 billion Yuan in 2010;
- The investments will reach over 10 billion dollars during this period;
- The development will focus on 6 industry areas;

- The industry basic development will concentrate in the 2 main industrial zones and 30 specialized industrial parks.

The main development areas of Chongqing IT industry include:

- Integrated circuit industry;
- Software and information service industry;
- New electronic component and automobile electronic industry;
- Telecommunication product industry;
- Instrumentation industry and digital medical treatment industry;
- IT an household electric appliance industry

As a main city supported by the State Western Development Program, Chongqing boasts 5 comparable advantages in the development of information industry:

First of all, geographical location of the region Chongqing is situated at the core region of China's Yangtze River Valley economic belt, a conjunction area joining the economically developed east and the resources-rich west in China, which may exercise" significant radiation force and influence to the neighboring provinces. Thanks to the efforts made over the past few years, Chongqing has powerful strength on economic aggregate, market, science and technology, financing, industry, infrastructure, etc., which take a leading position among the cities in the west.

Secondly, good industrial foundation is beneficial to the further development. With 33 institutions of higher learning, 320,000 students in school enrollment, nearly 500 R&D institutions, more than 700,000 science and technology staff, more than 600 significant science and techllo.1ogy achievements with advanced level at home and abroad, strong demand for the development of informatization, it has played a solid foundation on technical equipment, technical talents and market demand for 'the development of information industry in Chongqing, which enable Chongqing to be made available for the establishment of the state information industrial base. Robust industrial foundation in Chongqing also has the capacity to provide components for the development of electronic information product, embedded system and related products

Thirdly, advantage on low cost of labor force is particularly suitable for the development of electronic information product manufacturing. Surveys show that the annual salary in Chongqing IT industry is 34.9% lower than the average level across the country and human resources cost for software is 30-40% lower than that in the developed regions in the east.

Fourthly, advantage of market Chongqing is a material distributing terminal and commercial trading center in China's southwest region and upper reaches of Yangtze River with a capacity of covering more than 200 million-populated market. At present, Chongqing is implementing a new strategy on the development of industrialization by making use of IT innovation and upgrading traditional industry SQ as to build an information center and communication hub in the upper reaches of Yangtze River and to create "Digital Chongqing" as well. In particular, sustainable economic growth in the city over the past few years provide IT development a huge market and potential.

Fifthly, advantage of policy. In addition to the state policy, Chongqing is also compatible with other preferential policy associated with Western Development Program and Three Gorge immigrant relocation, etc. Particularly, high attention paid to the development of IT industry by the municipal leaders over the past few years create a favorable environment for IT industry in Chongqing.

The IT industry in Chongqing has a number of problems. First, the city suffers generally from low competitiveness of key enterprises and small-scale production. A number of company profiles are included in the Annex.

Of electronic information product manufacturing enterprises and software enterprises in the city, there are only Silian Group and Chongqing Xinwei with each income of sales more than 1.5 billion Yuan. There are another a couple enterprises with incomes of sales more than 100 million Yuan, mainly medium- and small-scaled enterprises, which are characterized by small scale, low capacity, unable to present a scale merit. Leading enterprises can only produce limited category of products and the capacity of scale production covering multi sectors and manufacturing several categories has been properly formed. With short length of industrial chain and low capacity to provide accessory for local products, upstream and downstream products are not properly combined to the extent that there is not a complete industrial chain being formed in place so far.

Second, there are quite a number of medium- and small-scaled electronic information enterprises in the city, majority of which lack the ability to achieve self accumulation and self investment. Especially for the emerging industry requiring high input, high output and fast growth, there is always limited project planning and capital input in place necessary to make relevant industrial chain grow stronger and bigger. Unsatisfied financing channels require further improvement in the investment environment and the development of electronic information industry is restricted due to imperfect capital guarantee system.

Third, the base to support technical innovation remains weak. Technical innovation and technical talents are the primary force to fuel the development of enterprises. Technical innovation system combining production study, research- application has been properly established in most enterprises, although there remains s from the old days an irrational structure of talent resources. This is evident from the considerable demand for technical craftsmen, particularly R&D talents at high level and high grade staff being familiar with technology, management and business operation.

Fourth, the capacity to provide accessory and poor level on enterprise management remains critical. As an old industrial base in the country, there are quite a few of traditional processing enterprise in Chongqing. But, low level of quality management, inaccuracy of machining, low technical level on injection, molding, and SMT surface mount adhesive restrict the capacity of providing accessory and impede the formation of industrial chain.

Since the reform and opening up, the electronic information industry in Chongqing experienced a sustainable, healthy, stable development with a high speed of increase, creating an industrial pattern with advantages and foundation covering integrated circuit, software and information service, communication equipment, digital medial

treatment, industrial control system and instrument, etc. Meanwhile, a number of key enterprises and leading products are fostered and introduced to simultaneously form a lot of enterprises to provide related accessory. As a result, electronic information industrial chain in the city has taken an initial shape.

The city continues to rely on large enterprises and groups in IT industry to create and improve electronic information industrial chain. There are 7 industrial chains in prioritized development in the city: integrated circuit, software and information service, communication equipment, instrument, digital medial electronics, information household electric appliance.

This report provides certain insights on the expansive development in Chongqing of human resources in higher education and the creation of a large number of incubators, university science parks, district industrial parks, and various specialized development zones. With a total population of some 30 million of which one third lives in the urban parts of the city and Chongqing is paving the way to become a major innovative and technology-driven center in West China, and has furthermore the ambition to become to become a knowledge city.

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Annex

Chongqing Industrial and Technological Development– Investment examples and priorities

I. Integrated circuit industry

Integrated circuit industry is the core and strategic industry of electronic information industry and modem manufacturing industry and is the foundation of modern information industry and information society. As a core technology for reforming and upgrading of traditional industry, it acts as a foundation and strategic industry associated with a country's national economy, construction of national defense, people's lives and information security. Due to its powerful exemplary role over the national economy for normally 10 times, it is known as "crude oil" of "electronic information industry" and "heart" and "brain" of IT industry,

There is a foundation available for fuelling the development of integrated circuit Industry in the city, particularly significant breakthrough was made on the integrated circuit industry in the city in 2004. Industrial foundation with considerable scale has been formed on chip design, chip manufacturing and encapsulation testing, etc. China Electronic Technology Group Corporation! No. 24 Research Institute, No 26 Research Institute and No. 44 Research Institute and other Chongqing-based science and technology institutions can playa role in the design of integrated circuit. Relying on simulating integrated circuit design by Chongqing Southwest Integrated Circuit Design Co. and combined integrated circuit manufacturing by Chongqing Sichuan Instrument Micro Ciruit Co, Ltd (CSIMC) and focusing on chip design, chip manufacturing and encapsulation testing, we are scheduled to import the project on a large scale' on integrated circuit chip manufacturing and encapsulation testing. Efforts are made to build an IC design industrialization and integrated circuit production base combining digital integrated circuit design, MEMS and automobile electronics and other mechanical-electrical integration products based on provision of integrated circuit products and application system solution scheme associated with it, R&D of test environment, test technology, test software, military integrated circuit and test screening, and centered on manufacturing, sale and service. We intend to make integrated circuit enterprises in the city grow stronger and bigger by introducing upstream and downstream enterprises on integrated circuit industrial chain.

II. Software and information service industry

Since 2000, the software industry in Chongqing made remarkable progress thanks to the support from the state, municipal Party committee and municipal government. The industry keeps a momentum of fast growth with incomes of sales rising by more than 60% on a year-on-year basis, leading to expansion of industrial scale and improvement of development environment. Meantime, typical software enterprises represented by Sunrise Gasoft, Born Technology, Nanhua Zhongtian, U-soft and typical software products represented by Gasoft 8e-ERP software, information management system used in Zhonglian Hospital, Haite Road Culvert CAD, Yesky information management release system become emerged. Priority will be given to the development of middleware, platform, information security, telecommunication, embedded type, digital recreation and application software used in the sector. Priority

will be given to the development of software servicing industry digital recreation sector in the focus. We will generate the development plan for Chongqing digital recreation industry by making full use of the opportunity that the state encourage to develop digital recreation and network games sector so as to build a pilot base on digital recreation industry in Chongqing. Software enterprises are also encouraged to get involved in business in added-value service field to start information system integration and ASP service; to start software engineering outsourcing service to help promote the software enterprises to achieve the transition from single software development to software industrialization production; to start busil1ess in financing, tourism, commercial trading, community and other 'service industry to expand the scope of software products and services.

Focus on software outsourcing services and try to expand software export. We will make full use of Chongqing Electronic& Computer Software Export Promotion Association to obtain export credit insurance, to establish subsidiaries through investment abroad, to win orders through overseas negotiation to invite specialists to give instruction and training, etc. in an attempt to explore subcontracting approach and to help enterprises develop software outsourcing services. We will take an active part in expanding software export channels, starting software package export and software-oriented processing export service based on lump-sum export strategy so as to increase the software export volume in Chongqing.

In terms of internet information service, focus is set on the support on enterprises providing the information. Enterprises are encouraged to develop application platforms on their own, to carry out network-based added-value service, to start the application of E-commerce, tale-education, remote medial treatment, healthy recreation on internet and "incorporation of telecommunication network, computer network, cable television network", construction of special wireless digital trunking network, broad band community network, high-speed broad band city area network, Card through the whole city project, etc.

III. Telecommunication product industry

Chongqing boasts good industrial foundation on telecommunication equipment, particularly wireless telecommunication equipment and terminal, access equipment and transmission equipment, etc. have taken an initial shape based on talent and technology advantage.

Focus our development on optical fiber access and network-related products, multi-service transmission platform (MSTP) 6300 series, intelligent total access platform (ITAP) 8000 series; Dense Voltage length-division Multiplexing(DWDM) series, PSAT series low level products, VSAT series high level products, dual-way data transmission products, TSD short message telephone set, mobile commercial telephone set, Bluetooth products, multi-media telecommunication and application system, accessory equipment and system integration, etc. Based on Chongqing Chongyou Information Technology Co., Ltd., Chongqing Putian, Chongqing Ericsson, UT Starcom, Hutchison Optel and other telecommunication equipment enterprises, try to introduce large-scaled enterprise groups to reinforce the development effort on telecommunication product manufacturing industry.

By giving full play to the advantage of our 3G R&D, support Chongqing Chongyou Information Technology Co., Ltd. to accelerate the industrialization of special baseband chip and 3G terminal so as to increase the capacity of design and production of RF integrated circuit and acoustic surface wave filter. Meantime, seek opportunity for cooperation with foreign renowned enterprises to push forward industrialization process of TD-SCDMA 30 mobile phone and to create more extensive industrial chain for 3G mobile phone on R&D, production, sales, operation, technical service, etc.

IV. Industrial control and instrumentation industry

There is a good foundation in place on industrial control and instrumentation sector in Chongqing and a leading position in domestic instrumentation industry has been fof11led. Based on Silian Group, try to introduce a large-scaled enterprise which can provide accessory to it to improve the ability to provide accessory and competition strength for Chongqing electronic manufacturing industry; to create an instrumentation industrial chain able to compete at home and abroad with leading products covering actuator, control valve, analytical instrument in whole set, DCS-based system integration, EJA intelligent transmitter, recorder, etc. Put more efforts to enhance the planning and construction of intelligent instrument industrial park in the North High-tech Zone. Focus the attention on industrial control, environmental protection; electrical automation: traffic automation, construction automation and test instrument, etc. so as to expel the development of system integration industry, application software and embedded software.

V. Digital medical treatment industry

There is strong ability of-science and technology innovation for digital medical treatment equipment industry in Chongqing, featured by varied products, generally small scale of enterprises' output, and remarkable deficiency of scale production. High Intensity Focused Ultrasound Therapeutic System (Haifu Knife) developed by Chongqing Haifu (HIFU) Technology Co., Ltd first raise the concept of "biological focus area", which is a large medical treatment equipment with proprietary intellectual property rights fully owned by China and is awarded significant technical invention in IT industry in 2003 and its products have been exported to UK, Japan, Korea, etc, developed by Born Co., "BORN-BE noninvasive cephaledema status monitor' "DK-2000A operation power device' developed by Xishan Science and Technology, "haemodialysis machine" and "urine dreg analytic system" developed by Tianhai Co., "intelligent Capsule Endoscope" developed by Incan science and technology Co. and "digital visible human" developed by the Third Military Medical University, etc. all win unique technical advantages and present a good prospects in the market.

At present, the city has the good foundation for the development of digital medical treatment equipment industry and has made available the industrial scale to a certain extent. A good pattern has been properly shaped with Haifu, Jinshan, Born, etc as the leading role, with Haifu Knife, medical radio endoscope, BORN-BE noninvasive cephaledema status monitor, US urine dreg detection and analytic system, DK-2000A operation power device, SWS continuous blood purification system, etc as the leading products. We plan to support related enterprises able to provide accessory and to introduce internationally renowned digital medical treatment enterprises to improve the digital medical treatment industrial chain in the city.

VI. Automobile electronic industry

Since automobile and motorcycle is the No. pillar industry in the city, it is of great significance to improve the percentage of technology utility for automobile and motorcycle industry in the city, to upgrade the level of products, to expand market share for the development of automobile electronic industry.

At present, the main enterprises in the sector are Chaoli, Jicheng, Xugang, Shenyu, Born, etc. with intelligent air conditioner and electric injection system, automobile sensor, automobile acoustics, vehicle-purposed navigation equipment, anti-collision radar, electrical power steering, electronic ABS, vehicle-purposed total intelligent system, etc. as the leading products.

Focus support on automobile comprehensive control, electronic control suspension system, vehicle fuel electric injection system and other vehicle electronic control. We wish to act as magnet for semi-conductor chip and electric component manufacturers and automobile electronic-based auxiliary parts vendors by systems restructuring our advantage on ability to make automobile in a whole set so as to improve our automobile industrial chain and to accelerate the development of our automobile electronic industry.

VII. IT and household electric appliance industry

IT and household electric appliance is an important part of electronic information industry and it is an obvious trend to apply IT to household electric appliance. Chongqing has had the ability to produce Konka’s television and set-top box, Chongqing Gree's air conditioner, Midea Group's refrigerating equipment, Zarva Technology (Group)'s MP3 and digital camera, etc. With the opportunity that Chongqing is selected as a pilot city for digital television and advancement of incorporation of telecommunication network, computer network, cable television network, push forward digital television, IPTV and related industries based on available intelligent air conditioner, set-top box, digital and tuner, CM/CMTS, etc. Eventually, try to make IT and household electric appliance become a pillar of electronic information industry in the city with the help of famous IT enterprises at home and abroad.

Main IT enterprises in Chongqing

1. China Silian Instrument Group Corporation Limited

Limited, a large-scaled enterprise group with combined operation in industry, science and technology, trade, etc, focuses his production on industrial automation control China Silian Instrument Group Corporation system, instrument, IT-oriented special integrated circuit, functional materials and other high-tech products, with a gross amount of assets of 2.2 billion Yuan and a staff member of 6936. The Group has become the biggest industrial base on comprehensive instrumentation in China.

The leading products are mainly used for metallurgy, electric power, petrochemical, light industry, communication, environmental protection, municipal public utility, etc. which present a good prospect. Since 2001, with a rapidly sustainable grow of the Coo's main economic indicators, the operation scale leaps into the front ranks of the nationwide industrial automation instrument industry. The Co. was assessed as Top 00 mechanical industrial core competitiveness across the country, Star of mechanical industrial competitiveness in the country, Top 1.00 enterprises of China's electronic information, Top 50 industrial enterprises in Chongqing and is among 66 key enterprises of growth and quality/benefit-oriented enterprises. In 2004, the Co. achieved the incomes of sales of 2 Billion Yuan, up 25% over the same period last year; the expected gross amount of profits of 90 million, up 39% over the same period last year.

Over the past few years, the technical innovation successes made by the Co. keep coming to the fore, and the Co. has been able to produce a large number of new products with core competitiveness, such as FCS field bus control system and software, intelligent field instrument, intelligent environmental protection analyzer, IT precious/general metal composite material, special IT integrated circuit, etc. Thanks to the nationally advanced technology utilized, some products are abroad. Currently, the main products often stay at 12-20% on market share over the past few years. EJA intelligent transmitter, thick film integrated circuit, composite material, vehicle-purposed drag cable, etc. take No. market share in the country. The Co. has established the strategic alliance partnership with ABB Automation Co. so that RHA/RS intelligent actuator is successfully resold to ABB. expanded the cooperation with Japanese Yokogawa Motor Co. 'he Co. has from EJA to paperless recorder, water analyzer and thermostat and other OEM products successfully enter the American market.

2. Chongqing Putian Communication Equipment Co., Ltd.

Chongqing Putian Communication Equipment Co., Ltd. (CHONGQING PUTIAN) is an information products and service provider with a history of46 years, which is a high-tech enterprise controlled by China Putian Information Industry Group Corporation. Chongqing Putian owns a registered capital of 290 million Yuan, assets of 550 million Yuan, fixed assets of 180 million Yuan, a staff member of 1348, of which there are 35 persons with senior professional title, 175 persons with medium-rank professional title and 377 technical persons in all disciplines. Chongqing Putian boasts 6 subsidiaries under its guidance.

The Co. imported cartridge, SMT surface mount adhesive, multi-layer printed circuit board, numerical control stamping, mechanical machining line using numerical control edge fold and numerical control circular shears, establishing an electronic product manufacturing system with advanced process level and a strong capacity of production.

Chongqing Putian's products are widely applied in fixed, mobile, internet and satellite telecommunication field, owning 6 main leading industries such as Optical Transmission Network System, Satellite Communication and Application System, Communication Terminals Equipment, Multimedia Communication and Application System, Electronic Products Manufacture Center, Corollary Equipment and System Integration. The Co. is also able to provide SDH, PDH optical transmission equipment, access network equipment, machine room erection equipment, commutation equipment, single side/double sides and multi-layer printed circuit board, wireless commercial telephone set, family e information telephone set, computer, video conferencing system, color sprayed printing paper, memory card, Bluetooth earphone, Bluetooth USE adaptor, ADSL equipment, media-rich added-value business, multimedia terminal inquiry system, VSAT fixed broad band satellite communication system, PSAT satellite communication system, etc.

Based on a scientific and technological R&D contingent of high quality, the Co. is the pioneer in the country to successfully develop PCM, SDH 155Mb/s, 622Mb/s optical communication equipment, of which SDH optical synchronous transmission product firstly passed the national evaluation and Tdlc-em pulse coding digital transmission product won the national silver prize.

The Co. is among the Top 50 industrial enterprises of Chongqing in consecutive 8 years, win the title of provincial cultural and ideological unit in Chongqing in consecutive 12 years, win the title of garden-like advanced unit in consecutive 16 years and was awarded the title of advanced unit on openness of plant affairs issued by the State-owned Assets Supervision and Administration Commission of Chongqing Municipal Government in 2003.

The products are sold to 30 provinces, cities, autonomous regions in the country and exported to Russia, DPRK, Nepal, Bangladesh, UK, Germany, Columbia, etc.

3. Chongqing Xinwei Telecom Technology Co., Ltd.

Chongqing Xinwei Telecom Technology Co., Ltd. is a high-tech enterprise founded in Chongqing High-Tech Development Zone in May, 1998 with a registered capital of20 million Yuan and a staff member of 760.

Xinwei Co. has the strong ability of R&D able to study the most pioneering and essential technology on the wireless telecommunication field in the world and to properly combine intelligent antenna, synchronous code division multiple access and other technologies and is committed to become the globally first-class wireless telecommunication access .technology and product provider based on complete available proprietary intellectual property rights. We intend to develop the overall solution scheme -"SCDMA wireless total access system" which is able to provide users mobile phonetic tone and broad band data and other wireless access business. By providing users LMCC, base station, base station controller, repeater, overhead

amplifier, CPE and other system equipments, allow users to build the access platform .to facilitate wireless portable regional communication, wireless broad band data, wireless public pay station and "each village access" in the countryside and to provide all kinds of terminal equipments, such as mobile phone, desk-mounted telephone, etc.

"SCDMA wireless total access system" owns complete proprietary intellectual property rights and more than 30 patents and was awarded many prizes such as To!? Prize on the Advancement of the State Science and Technology. Information Technology Industrial Ministry increase additional 15MHz frequency resources for SCDMA, which enables Xinwei to have his frequency resources up to 20MHz (1785-1805 MHz). Also, Information Technology Industrial Ministry allocate 3MHz frequency at 406.5MHz--409.5MHz frequency range to SCDMA application, which is used as the first choice for general telecommunication service in the rural regions in an attempt to resolve the problems on telecommunication and internet access in the countryside associated with agriculture, rural areas and farmers.

5. UT Starcom (Chongqing) Communication Co., Ltd

UT Starcom (Chongqing) Communication Co., Ltd. is a foreign-funded enterprise jointly invested by UT Starcom Communication Co., China Chongqing Telecom First Industrial Co. and Chongqing Gaoke (Group) Co., Ltd. on Nov. 21st, 2002, which has a registered capital of US$5 million and total amount of investment of 12.5 million Yuan. Located at Chongqing High-tech Development Zone, the 00 achieved an income of sales of 350 million Yuan and is expected to reach 530 million Yuan and plan to complete 1.5 million sets in 2004.

UT Starcom (Chongqing) Communication Co., Ltd. was formally founded in Feb. 2003, which is designed to enhance the informatization infrastructures level in the west regions with Chongqing in the center and the whole west being radiated. In July, 2003, the Co. was evaluated by Chongqing Science and Technology Commission to be a high-tech enterprise and passed ISO9001:2000 accreditation, obtaining the certificate issued by British Laws Co. In 2004, the Co. produced totally 5 million of PAS Xiaolingtong with an income of sales of 540 million Yuan and net profits of 13 million Yuan. REP system was put into operation since Feb. 2004, which optimized and shared the enterprise's resources.

6. Chongqing Born Technology Co. Ltd

With the software development and software service as a core competitiveness, Chongqing Born Technology Co., Ltd. is founded and designed to\make software harder and to serve the human life with software technical services.

Starting from original 300,000 Yuan in 1997, the Co. has grown up to an existing group enterprise with a registered capital of 20 million Yuan, total assets of more than 50 million Yuan, annual sales volume of more than 100 million Yuan, controlling 10 subsidiaries. The output value is expected to reach 108 million Yuan and profit payments and tax turnover reach 6.2 million Yuan in 2004.

The Co. has already passed CMM L2 international accreditation and SJ/Tl1235 national accreditation, becoming one of the 0 domestic enterprises with passage of two accreditations demonstrating the software ability. China Software Industrial Association Directorship, The Co. is also among the national "Qualified Enterprise on

Secondary Computer System Integration", "Qualified :Enterprise on Computer Information System Integration related to the State Confidentiality", "Approved Enterprises on Import/Export operation in P.R.C", "High-tech Enterprises" and "Software Enterprises".

The Co. deals with internet-based, embedded software. Key products at ministry and provincial level are digital medical treatment products - Born-BE non invasive cephaledema status monitor, automobile electronic products - direct tire pressure monitor system, assessment software products-key tax source management system and application software products-road construction project (owner) management system.

7. Chongqing Nanhua Zhongtian Information Technology Co., Ltd.

Founded in 2000, Chongqing Nanhua Zhongtian Information Technology Co., Ltd. is a high-tech shareholding enterprise with a registered capital of 20 million Yuan, which is engaged in computer system integration, computer software R&D, international network IT training and employs more than 200 persons, including 170-plus people on software development and system integration and 82% people with undergraduate diploma or above. The Co. possesses more than 10 software products with proprietary intellectual property rights, which won a couple of prizes from the state and the ministry. We have completed nearly 1000 informatization project constructions centered on computer, network technology, and software development.

Nanhua Zhongtian is an important contractor and technical provider on "electronic government affairs", "the Golden Customs Project (customs clearance automation project) ", "the Golden Tax Project (a national taxation computer network) ", "the Golden Shield Project", etc. Software products associated with electronic government affairs account for nearly 70% of market share in the city.

Nanhua Zhongtian is a pilot enterprise in the west participating in "China's Softwa~e1Export to Europe and America" organized by the Ministry of Science and Technology and is the first enterprise in Chongqing who establish software export department, achieving an export of more than US$5 million to Japan, HK, Macao, etc;

As a high-tech enterprise in Chongqing, Nanhua Zhongtian is the first of its kind to pass double software-related accreditations, obtaining Grade Two Qualification Accreditation on Computer Information from Ministry of fufot111ation Industry, computer confidentiality qualification related to the state secrecy from the State Secrecy Bureau, Grade Two Certificate on public security industry, qualification certificate on specific project design on building intelligent system integration: qualification certificate on import and export enterprises, etc; obtaining "Quality Pilot Enterprise in the Sector across the Country", "Creditability Pilot Enterprise on Quality Service in the Country and other honorary titles. The Co. was assessed "Top 100 Most Competitive High-tech Enterprises" by China News Press in 2004.

8. Chongqing Gasoft Co., Ltd.

Chongqing Gasoft Co., Ltd. is a key software enterprise covered by the planning and stands as the third biggest management software Co. in China. Headquarter-based in Chongqing, the Co. runs more than 40 affiliates and subsidiaries and 200 agents in Beijing, Shanghai, Guangzhou, Chendu, Shenyang, Xi'an, Wuhan, Nanjing, Yi'nan,

Tibet, etc., employing a total staff member of more than 500. It is expected to reach an income of sales of 120.6 million Yuan, profits of 12.78 million Yuan and taxes of 8.07 million Yuan in 2004.

Gasoft products include 6f financial management software, 7 s government affairs management software application suites.

It was as early as in Sept. that Gasoft successfully developed the first Windows-based financial software in China. Since then, the Co. successively put on the market a couple of management software which wins high attention nationwide. In 2004, Gasoft financial software and ERP software were recommended by China Computer User Association to be the first choice in the sector.

Gasoft is the only management software enterprise listed in 2003. "100 Nationwide Users Satisfied Enterprises" selected by Users Committed under China Quality Association and is among the key high-tech enterprises covered by 2004 State Torch Program.

Gasoft Group was founded in 2004 after the shareholding transformation by buying shares owned by Shenyang Neusoft Co. Ltd. again and importing international strategy investors in an attempt to become listed abroad at the end of 2005.

9. Chongqing China Science Popularization Media Incorporated Company

Chongqing China Science Popularization Media Incorporated Company was founded through thorough alternation from a limited liability company, the predecessor of which was Chongqing Computer Newspaper Co., Ltd. The Co. employs 13 doctors, more than 40 masters, 500 undergraduates and achieved sales volume of460 million Yuan and after-tax profits of 110 million Yuan in 2004.

The Co. runs business operation mainly on information development, development, manufacturing, sales of computer-related parts, computer system integration, publication, distribution of computer newspaper and magazines, consultancy for science and technology and commodity information, agent on media and ads, etc,

Excellent performances have been made by creating the Computer Newspaper; which keep the biggest circulations in the country in consecutive 8 years among the domestic computer medias and cover more than 2300 counties (cities). Computer Newspaper Supporting CD is an electronic media with No. in the country. The Co. takes shares in China's biggest IT website - Yesky. In 2003: circulation the online readers exceeded 1 million everyday and daily access to web page surpassed 10 million by readers from more than 60 countries and regions. Beijing PowerInfor Co., Ltd (jointly run by Tsinghua Science Park Development Center) shared by the Co. also exercise a certain influence across the country.

Cluster Initiation in Chongqing