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Technological Innovation and Urbanization Advance Together - TusPark□s Exploration and Practice

WORKSHOP 2 - STPs, science cities and urban strategies

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Editor's note: Stiglitz, famous American economist and winner of the 2001 Nobel Economics Prize, predicted that China's urbanization and America's high-tech would affect the development process of the future world. He also pointed out that in the new century, China would face three challenges, and the first of which would be China's urbanization. In 2011, China's urbanization rate exceeded 50% and reached 51.27%; the per capita GDP topped 5,000 dollars and reached 5,431.8 dollars. Whether China's urbanization can keep its high speed while improving efficiency and quality, it depends on how to advance with technological innovation.

Technological Innovation and Urbanization Advance Together

——TusPark's Exploration and Practice

The road to transform China's economic development pattern is the road of China's urbanization, which also is China's long-cherished wish of enterprise technological innovation. The urbanization road China has passed and will pass from now on will certainly be distinctive, and the bottlenecks and opportunities faced by China will be broken and grasped through technological innovation.

China's Urbanization Road is Distinctive

So far, so to speak, urbanization is one of the social development processes that have the greatest influence on human society, and almost is deemed as the only direct indicator of modernization and economic growth. China is one of the earliest countries in the world that started urbanization, and also is a country whose urbanization was slow in early days and accelerated in modern times. China took a quite distinctive road of urbanization development.

1. High speed. U.S.A. became independent in 1776, and it took American people 110 years to increase their urbanization rate of 7% in 1810 to 51% in 1920. In the 20th century, Latin American Countries experienced a fast urbanization process; from 1950 to 1980, the urbanization rate of Latin American Countries increased from 41.6% to 65.6%, which means their urbanization rate increased nearly 24% in just 30 years. However, the excessive and too fast urbanization made some Latin American Countries fall into the "Latin American Trap". Our country's urbanization rate increased from 13.62% in 1953 to 51.27% in 2011, and it took us less than 60 years to make our urban population reach 691 millions; our urbanization speed is almost twice as much as that of the United States. In the over 30 years after reform and open up, China's urbanization presented a trend of constant acceleration, and the urbanization rate in 2011 is 1.59% over that of 2010. The too fast urbanization pushed China to the verge of "Latin American Trap".

2. Large Population. China has a population of nearly 1.4 billion, so each one percent point of urbanization means 14 million people starting urban life, and nearly 70% of those people need jobs. Such a large scale and a high speed urbanization brought many economic and social

problems, such as “housing purchase problem”, “difficult and expensive medical treatment”, “difficult and expensive nursery service”, “no proper care and providing for the elderly”, etc; the emergence of hot words in society such as “dwelling narrowness”, “ant tribe”, “mortgage slave”, “child slave”, “boomerang kids” and “child-depending parents” reflects the realistic difficulties brought by our country’s large scale urbanization from different aspects.

3. Resource Shortage. Generally speaking, China has a vast territory and abundant resources, but when it comes to per capita resources, China lags far behind the world’s average level. In 2011, China’s per capita GDP topped 5,000 dollars and reached 5,431.8 dollars, but the per capita value ranked the 87th in the world. Our country’s per capita water resources is one quarter of the world’s per capita water resources; our country’s per capita oil reserves is only 11% of the world’s per capita oil reserves, and the per capita natural gas reserves is only 4.5% of the world average level; even our most abundant reserves of coal, our per capita reserves is 79% of the world average level. Our country has a large amount of various mineral resources, including 171 kinds of identified mineral resources; the reserves of 158 kinds have been identified. The total amount of our identified mineral resources is about 12% of the world’s amount, ranking the 3rd in the world after America and Russia, but per capita reserve is only 58% of the world’s average level, ranking the 53rd in the world. Resource shortage can directly cause difficulties to sustainable development.

4. Low Efficiency. Harvard University’s Professor Michael Porter pointed out that the competitive advantage development of nations usually goes through four phases, which are production-factors-driven phase, investment-driven phase, innovation-driven phase and wealth-driven phase. China’s current development depends too much on “demographic dividend”, “land dividend” and “investment driving”, and is a typical low efficiency development, which can directly cause the “five-lows”——low cost, low-technology, low price, low profit, and low-end market, and “four-highs”——high energy consumption, high material consumption, high pollution and high emission. It is a typical low price industrialization mode. Though China’s GDP surpassed Japan in 2010 and became the world’s second largest economy, China’s economic development is still large but not strong, fast but not excellent; our core technology is controlled by others, and the global value chain is controlled by others. The added value of our country’s high-tech industry only accounts 8% of the manufacturing industry, which is far lower than 40% in developed countries; 30% of China’s computer price will be paid to foreign patent holders, so the average rate of profit is only 5%; 20~40% of China’s CNC machine price will be paid to foreign patent holders, so the average rate of profit is only 5%, etc.

Technological Innovation Overcomes the Difficulties Faced by Urbanization

China’s urbanization will not slow down, nor will it stop. The key point to overcome the bottlenecks in space, talent, resources and efficiency is technological innovation.

1. Cluster technological innovation to overcome the limitation of space resources. As everyone knows, the 1.8 billion mu red line is our lifeline to guarantee the sustainable development of our 1.4 billion people and the later generations. China’s urbanization cannot continue the “blind expanding” development mode of some large cities or metropolises, nor should it seize the rural farmland without any unscruplousness. Further urbanization and

industrialization will bring more and more pressure to our country's food security and social stability. In many developed countries such as the United States, the urbanization rate is far higher than their industrialization rate. In 2011, America's industrialization rate was 20%; Germany is the country with the most developed manufacturing industry among developed countries, but their industrial output accounts only 30%. China's industrialization rate is as high as 47%, but the urbanization rate was lower than industrialization rate since 1962, and it just surpassed the industrialization level only a few years ago. Thus we can see that only by clustering technological innovation and using urban space resources intensively, can we improve the quality of industrialization and urbanization.

2. Internalize technological innovation to overcome talent shortage. Enterprise technological innovation is facing four realistic problems: "no intention of innovation for lack of motivation", "no courage of innovation for too many risks", "no ability of innovation for limited capability", "no chance of innovation for difficult financing". The key to overcome those difficulties is to internalize technological innovation in enterprises. More precisely speaking, to internalize talents willing to innovate and start new business in enterprises. Only when we have many innovative talents and entrepreneurs, can innovative enterprises appear one after another. According to American scholars' research on Silicon Valley's entrepreneurial situation in 2003, Apple Inc cultivated 94 entrepreneurs and 71 spin-off companies; Hewlett-Packard Company produced 117 entrepreneurs and 99 innovative enterprises. The entrepreneurs and spin-off companies from Cisco, Intel, Oracle, Silicon Graphics Inc, SUN, IBM are innumerous. It's because those internalized innovative talents and entrepreneurs who are continuing Silicon Valley's glory today and keeping its status as the global innovation center.

3. Normalize technological innovation to overcome system barriers. In our country, technological innovation resources mainly gather in cities. Due to the existence of various systems and regional culture (custom) against innovation and starting new business, the cost of enterprise innovation and personal initiation remains high. The latest "2012 Investment Environment Report" by International Finance Corporation says that world's average company registry period has reduced from 50 days in 2003 to 31 days, and the average cost has reduced from 89% to 36% of the per capita income, but in China, the difficulty of company registry is till higher than world's average level. In the latest ranking list of "The Easy Level of Global Business Operation in 2012" by the World Bank, China ranked the 91st among 183 nations and regions, 4 places down than 2011. The five items, including the easy level of starting new business, construction permit, power supply, investor protection and tax bearing ranked lower than the 100th. As urbanization advances, continuous technological innovation should become the normal state of enterprises. Government should strengthen their reform, lower the cost of innovation and starting new business, and overcome the system barriers to innovation and starting new business.

TusPark promotes the common advance of technological innovation and urbanization

The development phase during which a nation's per capita GDP increases from 3,000 dollars to 10,000 dollars will give birth to world top enterprises. Science Park is the cradle for world top enterprises. As the founder and operator of TusPark(Tsinghua University Science Park), Tuspark Co., Ltd explored a Science Park development pattern of "Congregation, Polymerization,

Focalization and Achievement" by integrating innovation resources such as "policy, industry, university, research, finance, motivation, trade, media". By means of radial development, it promoted the common advance of our country's high-tech and urbanization.

1. Three stages of TusPark's exploration and development

TusPark has experienced nearly 20 years development in three stages. **The first stage: construction and operation of the main park area.** Adhering to Tsinghua University's general objective to become a world first-class university in 100 years, TusPark's early positioning was a "scientific and technological achievement transformation base, new enterprise incubation base and innovative talent cultivation base". The Main Park Area outside the east gate of Tsinghua University started construction in 1992; the overall construction was finished and put into service in 2005, with a gross building area of nearly 730,000 sqm. Till the end of 2011, nearly 400 enterprises and research institutions settled in TusPark, covering six strategic new industries: energy conservation and environment protection, new generation IT, new energy, new material, biological medicine and new energy automobile, in the form of multinational corporation, high-tech small and medium-sized enterprises, technology financial institutions, and enterprises started by overseas returnees and Tsinghua University's alumnus; the annual sales volume topped 40 billion Yuan. At present, the main park area has 30,000 employees, of which 70% are R& D personnel; enterprises' patents added up to over 2,000. In TusPark, there are world class enterprises represented by Google, Microsoft, NEC, Schlumberger, and Chinese internet tycoons represented by Sohu, NetEase; what's more commendable is that there is a group of entrepreneurs, business mentors, technology elites, venture investors, angel investors, MBA, EMBA, many senior managers, and ceaseless passionate entrepreneurs. Planting Chinese parasol trees will attract golden phoenix. The gathering of high-end versatile talents made TusPark the first A Grade National University Science Park in China in 2003. Its industry-university-research cooperation with Tsinghua University also became regular.

The second stage: service updating and radial development. Innovative service also needs constant innovation. Complying with the active demand of innovative country strategy, TusPark raised the objective to construct a world top University Science Park. It upgraded innovative service comprehensively and developed a development pattern of "gathering, polymerizing, focusing and fusion" to lead science park industry advance toward high end development. Through redial development in three patterns: self construction and operation, cooperative development and output management, its influence covers over 30 cities and regions across the country. It strongly promoted the transformation and upgrading of regional industry and the scientific development of economy. The customer recognition of "Tsinghua Science Park", "Tsinghua University Science Park" and "TusPark" is becoming higher and higher. By constructing domestic and foreign sub-parks, TusPark has preliminarily realized large-scale, networking and internationalization.

TusPark Shanghai Multi-media Valley is a typical sub-park that inherits Beijing Main Park's construction mode, combines local government's innovation requirement, and organically integrates Tsinghua University's resources with local resources. It realized the benign interaction between "technology" and "city" through professional technology property, provided continuous support for innovative service by taking full advantage of real estate and capital operation, and solved the contradiction of the park's survival and development. In Shanghai, a city filled with

university resources and fierce innovative resource competition, the park's settlement rate reached 90% after 3 years operation. There are 6 technology startups that acquired 200 million Yuan financing fund in different phases. Especially the "entrepreneurial nursery garden" introduced 12 early-stage projects, transformed 6 incubators, and realized a successful incubated rate of 50% in less a year. It also realized an early-stage angel investment over 10 million Yuan. While gathering technology and talents, TusPark also invested and constructed grade-A office buildings like Huaqing Plaza, TusPark Buildings around the largest Green Park in Shanghai downtown, forming a picturesque urban landscape with the beautiful Daning Lingshi Park.

Tsinghua Science Park (Kunshan) is TusPark's typical representative sub-park which is constructed and operated by TusPark itself, and it is promoting technological innovation and urbanization together. Since it was officially put into service in October 2006, the Park has undertook 10 National 863 Projects; high level projects including Tsinghua OLED, large stamp forging press project were put into operation. There were totally more than 10 persons were selected into "Jiangsu High Level Innovative and Entrepreneurial Talents Plan" and "Gusu Leading Innovative and Entrepreneurial Talents Plan".

Tsinghua Science Park (Shaanxi) became a successful cooperative park-construction model of TusPark with local organizations. It provides development space and value-added services for west China enterprise incubation, high-tech enterprise R & D, innovative talents cultivation, research findings commercialization. Taking enterprise incubation as example, Tsinghua Science Park (Shaanxi) was identified as a national technology enterprise incubator in 2008. Its incubation area is over 30,000 sqm. It has incubated more than 100 enterprises.

Tsinghua Science Park (Yu Quan Hui Gu) is the first sub-park of TusPark in Beijing, which as a model of township industrial structure upgrading in Beijing. Sijiqing Town of Haidian District, was in charge of its construction, and TusPark provided management and operation services. Besides attracting investment for technology enterprises, it also provides policy support, technology transfer, financing, human resource and agency service, etc. At present, Yu Quan Hui Gu's enterprise settlement rate keeps over 98%. It has become an important base for Beijing's new media industry.

In addition, in cooperation with Shui On Group (Hong Kong), TusPark was entrusted the operation of Shanghai Knowledge and Innovation Community through management output. This Science Park is situated in Wujiaochang area, Yangpu District, Shanghai, surrounded by over 10 famous universities. It was co-constructed by Yangpu district government and Shui On Group. TusPark is in charge of its daily operation and management, and provides related services, including innovation resources integration, professional service platform construction, and enterprise interaction. At present, this Park has become an international incubation base with distinct features, complete services, active innovation and impressive domestic influence. It is also the first-choice platform and core park for the high level talents from developed regions like North America to start business and develop in Shanghai.

Innovation started industrial revolution in Britain and made America's high-tech lead the world. If

TusPark wants to become a world top University Science Park, it must interact with world top entrepreneurs and master entrepreneurial thoughts. In fact, TusPark's management team realized the importance of internationalization to the Park's long-term development long ago. They not only put "internationalization strategy" in the first place among the three strategies including "supporting platform strategy" and "redial development strategy" at the beginning of its establishment, but also started strategic layout in improving TusPark's global industrial popularity and influence very early.

In 2004, IASP Asia-Pacific Division was held in Bangkok. Mei Meng, director of TusPark Development Center, headed TusPark delegation attended the meeting. It was the first time that TusPark attended an international meeting in science park industry, and Mei Meng won the Best Paper Award at the first try. It was TusPark's debut on the world stage.

In 2006, at the Annual Meeting of the International Association of Science Parks held in Helsinki, Finland, Herbert Chen, deputy director of TusPark Development Center, was selected as one of the 12 members of the Association Council, and chairman of IASP Asia-Pacific Division.

In 2008, IASP Asia-Pacific Division was held in TusPark. IASP (China Office) is the only oversea representative institute of IASP was settled in TusPark.

In 2010, TusPark Co., Ltd's President Xu Jinghong attended the Annual Meeting of the International Association of Science Parks held in Taetok, Korea, and gave a keynote speech at the general meeting. In the same year, TusPark became a member of the Science Park and Commercial Incubator Development Center Council, UNESCO.

In 2011, TusPark became a member of Davos Forum's Global Agenda Council.

In 2012, TusPark made another important step on Internationalization Strategy, and had a new try to take the important place of innovation and entrepreneurship in the world. TusPark cooperated with Shui On Group, Northern Light Venture Capital and Silicon Valley Bank etc. to establish InnoSpring in Silicon Valley, America. So far, over 30 startups settled there, with over 100 investors from around the world participating actively. InnoSpring incubator is engaged in U.S.-China venture support. It helps the two countries' venture companies realize oversea development, and provides American and Chinese entrepreneurs with capital, instruction, site and audit services. In the future, TusPark will continue to promote the financialization, networking and internationalization of InnoSpring, and will provide Chinese and foreign innovative startups and entrepreneurs with more innovative service platforms in Britain and other nations or regions in the world.

The third stage: integrate industry and city, and explore technology new town pattern. Traditional single-function industrial park and Science Park cause "empty industrial area", "sleeping residential area" and "tidal traffic" in cities, and make the contradiction between "livable" and "enterprise-friendly" prominent, urban resources wasted, meanwhile, they are not good for technological innovation, making people worry about "counter urbanization". As a result,

industry-city integration is the ideal form for the combination of high-tech and urbanization. Green technology new town has become the future direction of urbanization and the development direction for future science parks. An ideal technology new town should be a technology new town complex based on attracting high quality talents, integrating entity industry development, innovative cluster introduction and complete living facilities into one.

For this idea, TusPark started to construct Science City Nanjing technology new town (low-carbon intelligent industrial park) in Nanjing in 2011. This project takes community, park and campus "linkage" and "green, low carbon, highly intellectual and high-end" as main idea. It strives to integrate industry, scientific research, dwelling, entertainment and education into one, and realize a comprehensive high-end community with low carbon intelligent science park, youth entrepreneurship center, comprehensive business district, education and training, and residential community can integrate and interact with each other.

With a planning construction area of 2 million sqm, Science City Nanjing lies in the core area of Nanjing Biological Technology Town. In the over 850,000 sqm park area, we will focus on building research and service agents, such as national level low carbon intelligent industrial research institute, professional incubator, youth entrepreneurship center, enterprise accelerator, pilot plant test studio, high-end research building and business park to attract leading enterprises and corporate headquarters in relevant industries to develop in the park, and form a complete innovation service system and industry ecosystem, creating it a technology new town with global influence in low carbon intelligent industry.

Meanwhile, in order to comprehensively meet the living needs of the high-quality people of different levels, Science City Nanjing will construct a picturesque international living community with excellent facilities and complete services by fully taking Tsinghua University's comprehensive advantages in education and training. The park will have high level schools and over 300,000 sqm business district, including shopping center, large community center, high-end hotels, restaurants and recreational facilities. Added with the educational resources of 30 universities and 500,000 college students within 10 km, there will form an organic benign interaction between the campus, science park and living community. At present, the park's construction has been started. The typical project resulted from TusPark's exploration and practice in the common advance of technological innovation and urbanization——Science City Nanjing will change from a dream into reality in the near future.

2. TusPark's new attempt to upgrade traditional incubator

The Early-stages incubators were mainly rental building mode. Incubator funded companies develop with the rent. Science Park is the cradle for high-tech enterprises, the platform for innovation and venture, and the important bond for future urbanization. TusPark deeply understands the inner relation between technology and finance. By constantly upgrading the traditional incubator and exploring incubator's financialization development, TusPark initiated the "incubation + venture capital" enterprise incubation mode in the country. TusPark also had some nice try and explored exchanging equity with space and service. So far, TusPark's venture

investment “incubation + venture capital” mode has successfully incubated 9 domestic and overseas listed companies, including Sumavision, Beijing Highlander Digital Technology Co., Ltd, iReal Technology Co., Ltd etc. and has invested in nearly 100 startups in total. At present, funds and assets entrusted to TusPark Ventures have reached 2 billion Yuan. TusPark Ventures mainly invests in innovative high-tech enterprises in IT industry, life science, clean technology, creative industry and modern service industry.

Around technology enterprise’s development path “from nothing to something, from small to large, from large to strong, from domestic to international”, TusPark aims at creating a full-product-line financial service business and forming a whole-function technology financial service platform. TusPark will provide enterprises, especially high-tech enterprises with whole life circle financial services depending on Tuspark Financial Holding Group. Technology Financing will become a main business for TusPark, and the primary services will include the following aspects: first is direct investment, including angel investment, venture investment, equity investment, securities investment funds and property funds; second is credit, we will provide enterprises with petty loan through bond financing and finance companies, and play the role of technology bank; third is investment bank business, we will provide science-and-technology enterprises with merger, project financing, assets management, and investment consultation service; fourth is mixed operation, we will promote the permeation and crossing of trust business, technology bank, finance lease, and investment banking.

In the future, TusPark will not only provide enterprises with first rate physical space, but also will enhance the value increase space for settled enterprises by constructing public technology (transfer) service platform, public test platform, policy support service platform, and human resource service platform. It also will further accelerate enterprises’ development speed by building a bridge between technology and finance.

3. TusPark’s effort to advocate innovative and entrepreneurial culture

Some scholars pointed out that Silicon Valley is a pronoun for American high-tech. While creating economic miracles, it also creates a Silicon Valley culture. By holding “TusPark Innovation Forum & TusPark Nationwide Sub-parks Network Annual Meeting” (hereinafter referred to as “TusPark Innovation Forum”), researching and releasing “China Top 100 Urban Innovation and Venture Ranking List”, and publishing such as “Tsinghua Management Review” and “TusPark Observation”, TusPark advocates Chinese local innovation culture. It seeks innovation and difference, tolerates failure and “betrayal”, and improves urban and regional competitive soft power through demonstration and model effect. Since 2009, “TusPark Innovation Forum” has been successfully held in Beijing, Yixing, Guangzhou and Jining, which realized the primary purpose of “exchanging innovative practice, spreading innovative thoughts, promoting innovation culture”. Jointly established by Tsinghua University, the Ministry of Science and Technology, Administrative Committee of Zhongguancun Science Park, Haidian District Government, and operated by Tuspark Co.,Ltd, TusPark Innovation Research Institute strengthened the tracking, evaluation and research of Chinese regional economic innovation and venture environment, based on TusPark’s 20 years practical experience. In 2011, TusPark Research Institute for Innovation

released “China Top 100 Urban Innovation and Venture Environment Ranking List” to the society for the first time. The research results won recognition and high praise from both the society and government. In order to spread innovative ideas and guide innovative practice, “Tsinghua Management Review” started publication in Beijing in April, 2011, and “TusPark Observation” officially started publication on September, 2012.

Limited space for unlimited dreams. By constructing a group of high-tech parks, incubators, and technology new towns represented by Tsinghua Science Park, TusPark Co., Ltd will continue to devote itself to promoting the common advance of technological innovation and urbanization as always. Through mature technological innovation service system and service mode, it will actively and bravely undertake the historical mission of constructing innovative city and innovative country.