UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

商务部国际贸易经济合作研究院
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EXPERIENCES AND BEST PRACTICES OF INDUSTRIAL PARK DEVELOPMENT IN THE PEOPLE'S REPUBLIC OF CHINA

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FOREWORD

The United Nations Industrial Development Organization (UNIDO) is a specialized agency of the United Nations on industrial development. Through the adoption of the Lima Declaration in 2013, the Organization's development priorities focused on the promotion of inclusive and sustainable industrial development (ISID). This development priority is embedded in the 2030 Agenda for Sustainable Development through Goal 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". With the Sustainable Development Goals (SDGs) are interlinked by nature, ISID contributes towards addressing the economic, social and environmental dimensions of sustainable development in a systematic and holistic manner. For ISID to be a critical enabler of the SDGs, among others, adequate infrastructure development that can support investment in priority sectors of Member States and overcome the constraints associated with doing business in an economy.

Inclusive and sustainable industrial parks are vital to supporting industrialization and structural transformation, especially in developing countries and middle-income economies. Industrial parks help address business infrastructure challenges in particular geographical areas and overcome barriers to investment. It can help generate high productivity, stimulate innovation and promote investment, as well as foster social inclusion and environmental protection.

Over the past four decades, UNIDO has been promoting industrial parks among its member countries - assisting Member States in the planning and establishment of industrial parks to support sustainable growth. UNIDO provides technical support and advisory services at all stages of the development of industrial parks, ranging from planning support in terms of pre-feasibility and feasibility analysis, master-plan formulation, to industrial parks operations, management support and investment facilitation. This accumulated experience enables UNIDO to be a leading entity in the promotion and development of industrial parks.

In 2018, UNIDO partnered with the Chinese Academy of International Trade and Economic Cooperation (CAITEC), one of the 25 high-end national think tanks in China, with more than 70 years research experience, to jointly promote industrial parks. To effectively utilize the potential of industrial parks to drive new sustainable pathways towards industrialization, the two organizations produced a publication examining China's industrial parks development experiences and best practices. The publication proposes a set of guidelines that can be replicated and scaled up, and it acts as a reference tool detailing the processes involved in the development and operationalization of industrial parks.

UNIDO has a long history of cooperation with China ever since the People's Republic of China became Member of UNIDO in 1972. Cooperation between UNIDO and China on industrial parks development dates back to 1980 when the government of China decided to establish several special economic zones (SEZs) in the provinces of Guangdong and Fujian. In September 1980, UNIDO organized a six-week study tour for a Chinese delegation to benchmark the experiences of Ireland, Malaysia, Mexico, the Philippines, Singapore and Sri Lanka. This was the first Chinese delegation sent abroad to study the implementation of SEZs. This historical visit led to recommendations which contributed to the development of legislation governing the operations of China's SEZs, and the establishment of China's first generation SEZs.

China's industrial park policy is one of the key outcomes of the "reform and opening up" policy that China adopted in 1978. Guided by this policy, China's industrial parks have played a significant role in driving China's economic development, the growth of the industrial sector and, more broadly, its internationalization. Over the last four decades, China's industrial park development has evolved through various development stages, ranging from an experimentation and exploration period, to today's reform and innovation period. They have significantly contributed to China's remarkable economic and social transformation, rapid technological development and scientific innovation. Industrial parks played an indispensable role in promoting regional economic development, institutional reforms and the opening up of its economy, setting the stage for China's industrialization.

China offers various successful and diverse industrial parks experiences with global recognition. Its experiences have been successfully replicated and promoted in many countries and have been used as a benchmark model for

industrial park development globally. Therefore, an in-depth analysis and objective stocktaking of China's industrial parks development model and the dissemination of its experience is valuable for countries considering industrial park as part of its industrialization policy, in particular developing countries and middle-income economies.

We hope that this document will provide useful lessons learned and best practices as the global community progresses towards the achievement of the Sustainable Development Goals (SDGs), particularly SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

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BOT	Build-Operate-Transfer
BT	Build-Transfer
GACC	General Administration of Customs of the People's Republic of China
GDP	Gross Domestic Product
MOFCOM	Ministry of Commerce of the People's Republic of China
MOST	Ministry of Science and Technology of the People's Republic of China
NDRC	National Development and Reform Commission of the People's Republic of China
NDZs	National Development Zones
POPs	Persistent Organic Pollutants
PPP	Public-Private-Partnership
SEZ	Special Economic Zones
TOT	Transfer-Operate-Transfer
USD	United States Dollar
UNIDO	United Nations Industrial Development Organization

EXECUTIVE SUMMARY

China's "reform and opening up" policy was launched in 1978, which laid a solid foundation for its economic development, in particular the establishment and rapid expansion of special economic zones (SEZs) and Industrial Parks. Industrial parks have played an important role in promoting China's rapid economic growth and accelerating its pace of industrialization and integration into the global market.

Like other countries, China faced many challenges in this process, including constraints related to infrastructure financing, industrial park service delivery and the coordination of industrial park policy measures. China has accumulated experience building industrial parks by *"crossing the river by feeling the stones"*, drawing upon lessons learned abroad, and as a result of 40 years of development, China's industrial parks have made remarkable achievements in terms of economic output, cultivation of industry, scientific and technological progress, openness to the outside world, ecological preservation and environmental protection. These parks have become China's most dynamic economic growth areas with the greatest potential for development. Thus, it is of great value for other countries, especially developing countries, to study China's successful industrial park experience and the related development models.

Since the establishment of the China's first industrial park in the mid-1980s, China has established various types of parks of different scales. These parks are categorized as follows: SEZs and National New Areas, National Development Zones, Provincial Development Zones and Secondary city-level Development Zones. National Development Zones (NDZs) are considered the best-developed industrial parks approved by the State Council of China, and the best place to perform certain economic functions. This study analyses the best practices of the representatives of NDZs, namely national economic and technological development zones, national high-tech development zones and special customs supervision zones, by using information drawn from relevant state agencies, industrial parks, field visits, and interviews with park management authorities. Those parks have shaped the history of China's national industrial park development, representing the highest level of development in this area. They employ management models fitting local conditions and are in different stages of industrial development. It is hoped that this study will offer a set of best practices and serve as a reference for the developing countries and transitioning economies to develop their own industrial parks.

INDUSTRIAL PARK PREPARATORY WORK

The preparation stage includes the setting of objectives, the selection of a site and the conducting of feasibility studies. The definition of the underlying objectives and expected benefits of a proposed industrial park are crucial to the park's success.

While economic objectives are the fundamental driving forces behind the building of industrial parks, they are not the ultimate purpose, as industrial parks also have explicit social and environment protection objectives. Maximizing comprehensive benefits is the ultimate goal of industrial park development.

Multiple factors influence the site selection of an industrial park, and the decisive factors have evolved over the course of industrial park development in China. Earlier industrial parks served as important tools to stimulate foreign trade and economic cooperation, and to experiment with institutional reform and innovation. In the past, the decisive factors for site selection were ease of conducting exchanges with foreign investors and the prevention and control of risks. Since the 1990s, the key decisive factor for site selection has shifted toward "driving regional development", resulting in the development of new industrial parks in inland regions. Ease of transport, access to infrastructure, utilities, labor supply, availability and accessibility of land, and natural conditions such as topography and geology, are further crucial considerations for site selection, as well as the relationship between the park and the host city for sites within or near city limits.

The feasibility study is the starting point for the

construction of an industrial park. It normally includes analyses of: the local development conditions, the macro environment, industry selection, resources and environmental carrying capacity, risks, and a cost-benefit analysis pertaining to construction.

INDUSTRIAL PARK PLANNING AND CONSTRUCTION

Planning and construction are key elements for ensuring the development of high-quality industrial parks and are primary prerequisites for ensuring their sustainable development.

Three major plans guide the development of China's industrial parks: the industrial development plan, the territorial and spatial plan, and the investment and financing plan. The industrial development plan is prepared in accordance with indicators defined in the national economic and social development plan, and the spatial control and spatial utilization requirements of the province/city where the park will be located. It also conforms to the investment and financing plan that outlines funding needs and investment mobilization requirements. The industrial development plan is the foundation, the territorial and spatial plan is the platform, and the investment and financing plan is the guarantee.

The industrial development plan is the fundamental guiding plan to guide the sound, stable and sustainable development of industries in a park. Its main contents should include: State quo and trend analysis of industrial development in the park's location; Positioning of the leading industry; Industrial planning; and Implementation of the industrial development strategy.

The park's territorial and spatial plan is a technical plan to guide the construction of buildings and facilities in accordance with the park's industrial layout and spatial control requirements. The plan has two tiers: the detailed plan of control and the detailed plan of construction.

The detailed plan of control should include: Land scale control; Land function control; Land index control; Ecological index control; and Environmental index control. And the detailed plan of construction should include: Status quo and development condition analysis; Scale and land layout planning; Design guidance; and Special planning.

The park's investment and financing plan supports the overall cost and benefit analysis for all stakeholders in what regards the construction and operation of the park. This plan should outline: Investment and financing environment and subject analysis; Investment and financing models and channel analysis; Investment and financing scale and cost estimation; and Profit model analysis.

Finally, this stage also covers park construction and implementation, based on three major subsets of activities: Preparatory activities, such as the establishment of a stewardship committee to effectively lead and coordinate relevant construction departments; Implementation tasks including land expropriation, demolition, compensation, tendering, and fund raising, as well as the construction of industrial facilities, public service facilities and municipal infrastructure within the park; and Assessment and acceptance tasks, including on-site inspection and review of documentation in accordance with the objectives and assessment indicators. The assessment results and any remedial recommendations should be provided.

INDUSTRIAL PARK MANAGEMENT

Park management includes the management models and the legal framework for park management. Over many years of experience and continuous experimentation, China has developed unique industrial park management models that have contributed to the successful development of its industrial park development model. Operators of various industrial parks have devised diverse management models to facilitate industrial clustering, cluster development, administration and public services, as well as debt-financed and equity-financed development. Three park management models, namely committee management, hybrid management, and corporate management are currently in use in China. These management systems have distinct features, take national conditions into account, and have been influenced by international common practice in what regards park management.

At present, most of China's industrial parks have centralized and streamlined their administrative authority, and are managed by committees. The park is directly managed by the local government or the government agency under whose jurisdiction it falls. The hybrid model includes commissioned vertical management (over sub-district office and township government) and horizontal consolidation (with government agencies at the same level). Integrating development zones and administrative functions allows for the park and the surrounding region to complement each other in terms of talent, land, infrastructure, investment promotion and public service. Under the corporate management model, the park establishes a legal entity to manage it, such as a development company.

The legal basis for park management in China mainly includes legislation issued by the central and the local governments, including park-specific regulations. At national level, the management of the industrial parks is based on the laws and regulations regarding the construction and operation of the industrial park under China's socialist legal system. These include local administrative regulations as well as laws passed by the National People's Congress and the Standing Committees. "Park-specific regulations" serve to supplement national laws to improve the regulatory environment in the parks, and refer to relatively complete and detailed regulations and measures applicable to Chinese industrial parks.

INDUSTRIAL PARK MARKETING AND INVESTMENT PROMOTION

Investment promotion includes the identification of qualified enterprises, devising investment promotion policies and defining the means of investment promotion. In principle, projects in the park should comply with industrial policies and rules, environmental protection rules, economic benefit principles, rational land planning and practicability.

Investment promotion in parks mainly includes investment promotion agencies, policies and means of promotion. Each industrial park has a dedicated investment promotion body in charge of marketing and investment promotion. These bodies are usually referred to as 'investment promotion bureaus' and 'commerce bureaus'. The activities of the body are guided by investment promotion policies. These policies cover issues such as tax breaks, financing support, cost reduction and financial rewards or fee exemptions. Special policies to encourage industry clusters and industry-specific policies are also enacted to support promotion activities. Different means of investment promotion strategies are applied in different stages of park development. Industrial parks can promote investment using the following methods: i) investment promotion by means of the internet and the media, ii) event-based investment promotion, iii) overseas investment promotion, iv) investment promotion by generating an industrial chain, v) investment promotion through commissions, vi) door-knocking investment promotion, and vii) special features-based investment promotion.

INDUSTRIAL PARK OPERATION AND MAINTENANCE

An industrial park's operation goals consist of promoting economic development, ensuring social services, protecting the environment and supporting inter-park cooperation.

One of a park operator's top priorities is ensuring that the park achieves its desired growth objectives in all aspects related to industrial development, such as infrastructure, talent support, workplace safety, scientific innovation and business incubation. Industrial park operation also involves managing social activities and resolving any related social issues. More social attributes to the parks have been added recently, due to an increasing number of people working and living within the park. Key social services that have become increasingly integral to the park's daily operations include administrative services, education, medical services, community building, and cultural events.

Environmental protection is equally important, because economic growth should not come at the expense of the environment. Chinese industrial parks take environmental protection seriously in their daily operations, implementing measures for the prevention and treatment of pollution, ecological preservation, environmental monitoring, waste disposal, conducting environmental assessments and approvals, and encouraging the use of clean energy.

Promoting inter-park cooperation and joint development is another crucial element in the operation of industrial parks. Industrial parks can share technologies, resources, markets, talents and taxes and cooperate with each other through the "enclave model". Pursuing joint development is an effective means of limiting the effect of unbalanced growth, facilitating resource use and optimizing resource allocation.

INDUSTRIAL PARK PERFORMANCE EVALUATION

Performance evaluation seeks to present an objective and comprehensive picture of a park, and offer insights into its strengths, features and shortcomings. By establishing an indicator system, evaluations provide a reliable reference for the formulation of national level development strategies and policy adjustments. Performance evaluation for industrial parks defines the desired objectives of the evaluation process, the indicator system, and implementation.

The indicator system consists of the overall index, itemized indices and the assignment of weights, calculation methods and index benchmarks. Five main indicators are supported by relevant secondary indicators. The main indicators include: economic development, contributions to regional development, resource utilization and ecological environment, investment environment and scientific and technological innovation. In principle, the indicator system for evaluating the performance of industrial parks is comprehensive, directional, and comparable with both dynamic and static indices.

A performance evaluation is carried out once a year and is organized by the relevant Leading Committee. The results of an annual performance evaluation reflect the park's development over the year, based on the previous year's evaluation index data. Evaluation procedures include data acquisition, a preliminary check, data review, data sampling, data processing, publicity and the release of results.

When the park's evaluation is complete, the relevant Leading Committee communicates the park's assessment results to the designated authority. Developed parks should be encouraged to export their management experience and promote the coordinated development of other parks. A certain exit mechanism is introduced for relatively less developed parks.


23:35:60
Business Strategy

SECTION 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Since the 1960s, industrial parks have served to support an increasing number of countries' industrialization and economic restructuring. Today, the concept of the industrial park is gaining more acceptance internationally and the industrial park economy has become widespread. For developing countries, industrial parks can maximize the integration of scarce factors of production within geographically delineated areas. Industrial parks create jobs, improve wages, and enhance the skill base of local workers by attracting capital and technology to a country's manufacturing and service industries and facilitating the transfer of technology and know-how. Industrial parks also upgrade industrial structures, leverage the utility of comparative advantages and improve a country's international competitiveness and position in global value chains.

China's industrial park policy is one of the key outcomes of the "reform and opening up" policy, adopted in 1978. Guided by this policy, industrial parks have played a significant role in driving China's unprecedented economic development, the growth of its industrial sector and its internationalization. Over the past four decades, China has experienced challenges similar to those that many developing countries face today, such as infrastructure financing, coordination of policy measures, as well as other challenges specific to industrial parks (i.e. industrial park service delivery issues). Guided by the principle of "emancipating the mind and seeking truth from facts", Chinese industrial parks tailor policies and measures to local conditions, emphasizing the comparative advantages of land, market and labour.

Establishing industrial parks with preferential policies at local, provincial and national level, has become the main strategy for Chinese government to facilitate industrial development and technological innovation. Over time, China's central and provincial governments and private developers have accumulated considerable expertise in planning, developing, and operating industrial parks. Today, nearly all provincial capitals, autonomous regions and major cities in China have industrial parks, designated as "national industrial parks". China will continue to establish and improve industrial parks and give full play to their role in fuelling economic growth. In particular, the building of the overseas cooperation zones will be promoted to support the internationalized development of the parks.

UNIDO's recent involvement in fostering the development of inclusive and sustainable industrial parks has covered a broad range of parks, including integrated agro-business, sustainable industrial parks and green industrial parks, which are tailored to Member States' specific contexts and preferences. UNIDO was one of the few international organizations that played the role of bridging between the East and the West during the

[1] UNIDO: Marking the Anniversary of UNIDO -UNIDO-China cooperation. https://www.unido.org/sites/default/files/2016-11/UNIDO_CHINA_EN_SP_0.pdf

Cold War period[1] in this regard. In the 1970s, UNIDO organized a visit for a Chinese delegation to the SEZs of six countries, including Ireland, Malaysia, Mexico, the Philippines, Singapore and Sri Lanka. The delegation gathered in-depth knowledge about issues related to SEZs and submitted its recommendations to the State Council and the National People's Congress, which fed into the legislation concerning the operation of China's first SEZs. UNIDO also assisted Member States in improving their industrial policies by sharing best experiences and providing policy advice. In this regard, Chinese experts and professionals have shared their experiences of promoting industrialization and structural transformation on multiple occasions.

1.2 SIGNIFICANCE OF THE STUDY

China established its first industrial parks in the 1980s, with the aim of providing industrial space where businesses and industries could concentrate. Industrial parks represent the government's new model for running its socialist and export-oriented economy and promoting institutional innovation. Over the last four decades, China's industrial park development has evolved through four development periods: Experimentation and exploration period; Rapid growth period; Scientific development period and Innovation and upgrading period.

By 2018, China has 552 State Council-approved development zones, including 219 economic and technological development zones, 156 high-tech industrial development zones, and 135 special customs supervision zones (The Catalogue of the Review Announcement, 2018). These zones have contributed significantly to China's remarkable development in terms of an increase in total output, incubation of enterprises, scientific and technological progress, openness to the outside world, ecological preservation and environmental protection. Industrial parks have become the most dynamic economic growth areas with the strongest potential for rapid technological development and innovation in China. China's 375 economic and technological development parks and high-tech industrial development parks have together contributed RMB 18.6 trillion to the Chinese economy, making up more than one fifth (22.5%) of the GDP, in addition to a tax revenue of RMB 3.3 trillion or 22.9% of total national tax revenue in 2017.[2]

Furthermore, these parks have also improved the upgrading of industrial structures, and have driven the economic growth and sustainable development of their host cities. Studying this Chinese development model centred on industrial parks and disseminating the experience are thus of great value to industrial park stakeholders, in particular to developing and transition countries. This research project is of significance in the following areas:

Industrial parks have played an indispensable role in promoting regional economic development, institutional reform and opening up the economy, setting the stage for China's economic take-off, urbanization and improvement in standards of living. They are the pacesetters in China's industrialization process. No other developing country in the world has produced such fruitful results in the development and promotion of industrial parks. This fact supports the value of sharing China's experience with UNIDO Member States, partners and the private sector.

The presence of many successful and diverse industrial parks with different resource endowments provides an abundant number of success cases for UNIDO Member States to examine. China has a vast territory and industrial parks are found across the country. Their development condition varies from one region to another, and parks in different regions have adapted to local conditions and boast prominent results. For example, the national economic development zones in coastal cities are designed to foster opening-up policies through international trade, innovation, and improvement of resource allocation. Industrial parks in central and western China and "old industrial parks"

[2] China Economic Net: "The 2018 China Industrial Park Sustainable Development" was released in Shanghai. http://www.ce.cn/xwzx/gnsz/gdxw/201812/04/t20181204_30945580.shtml

based in northeast China prioritize learning and replicating experiences of successful industrial parks and take over industries formerly located in the eastern region, yielding good outcomes. China can therefore offer a wide range of representative samples of successful industrial parks, which are of great research value and chance for replication.

China's industrial parks have earned a positive global reputation and have been recognized by countries around the world. Their experience has been successfully replicated and promoted in certain countries. They became a benchmarking model for industrial park development in many developing countries. For instance, Russia, Egypt and India have sent multiple delegations to learn China's industrial park operation and development. In 1997, Egypt began to turn to China for assistance and cooperation on building the northwest economic zone in the Gulf of Suez. By the end of 2017, Chinese companies had built 99 industrial parks (known as foreign-invested economic and trade cooperation zones) in 44 countries, amounting to a cumulative investment of USD 30.7 billion[3].

In general, although China's industrial parks vary in types, locations and management models, they attract foreign investment and have driven institutional innovation. China's industrial parks have become the new drivers of economic growth in their host cities, the centres of technological and managerial innovation, the landmarks of modern cities and the role models for industrial park development in the world. Thus, an in-depth analysis and objective stocktaking of China's experience is of great value and practical significance to China and other countries in the world, especially developing countries.

1.3 SCOPE OF THE STUDY

China has various types of parks that differ in administration level, scale/scope and target industries. Based on the criterion of administrative levels, Chinese industrial parks can be grouped into the following categories:

a. Special economic zones and national new areas;
b. National development zones (such as economic and technological development zones[4], high-tech development zones[5], special customs supervision zones[6], border economic cooperation zones, etc.);
c. Provincial development zones (such as various development zones approved by the provincial, municipal and autonomous region governments);
d. Secondary city-level development zones (such as city- county- and village-level development zones).

[3] Chinese Social Science Net: Promote the development of overseas economic and trade cooperation zones. http://ex.cssn.cn/zx/zx_gx/news/201807/t20180711_4500471.shtml

[4] Note: A national economic and technological development zones is where the government draws a clear geographic boundary for an area in open coastal cities and some inland cities to focus on improving infrastructure, creating an investment environment in line with international standards, developing new industries and scientific research projects by attracting foreign investment, and forming a modern industry structure based predominantly on high-tech industries. This qualifies the area as a special area for the host city and its surrounding regions to develop foreign trade and economic ties with foreign countries. An example is the Guangzhou Economic and Technological Development Zone.

[5] Note: A national high-tech development zone is a state-level science and technology industrial park approved by the State Council of China. It is a concentrated area that relies on a knowledge-intensive and an open environment, builds on domestic scientific, technological and economic strengths, fully draws on the advanced foreign scientific and technological resources, capital and management tools, creates favourable soft and hard environments within the confines of the area by implementing preferential policies and other reform initiatives for high-tech industries, and that maximizes the transformation of scientific and technological achievements into real-world productivity.

[6] Note: Approved by the State Council, a special customs supervision zone is an area established on the territory of the People's Republic of China, with the special function and policy of receiving transferred international industries and connecting the domestic market to the international market, with the particular economic function of closed supervision, conducted primarily by the Customs agency.

It should be noted that some comprehensive and well-developed national industrial parks can be considered as both economic development zones and high-tech development zones. Furthermore, industrial parks that register exceptional economic, social, environmental, or technological performance can become demonstrative zones after the approval of relevant authorities so as to further develop their capability in certain areas. For example, the Suzhou Industrial Park and the Kunshan Economic and Technological Development Zone have gained national eco-industrial demonstration park status following thorough evaluations by the Ministry of Ecology and Environment[7]. Similarly, the Ministry of Science and Technology has designated Zhongguancun Science Park in Beijing as a national independent innovation demonstration zone[8]. The different types of industrial parks in China are shown in Table 1:

No.	Type	Description	Example
1	National New Area	A comprehensive functional area that fulfils the major strategies of national development and reform and opening up.	Pudong New Area of Shanghai, etc.
2	Special Economic Zone	A designated area that has adopted special policies, which is more open and flexible in terms of economic activities related to foreign countries than other parts of China.	Shenzhen, Zhuhai, Xiamen, etc.
3	Pilot Free Trade Zone	A special economic area within China's territory, focusing on institutional innovation and ensuring that such innovation is replicable and scalable. It is the forerunner in speeding up the transformation of government functions, exploring systems and institutional innovation, promoting investment and trade facilitation, etc.	China (Shanghai) Pilot Free Trade Zone, China (Guangdong) Pilot Free Trade Zone, China (Tianjin) Pilot Free Trade Zone, etc.
4	National Economic and Technological Development Zone	It is an area which has clear geographic boundaries within coastal cities and some inland cities, focused on improving infrastructure and creating an investment environment that is in line with international standards. By introducing new industries and technologies it has become a special area for the development of foreign economic cooperation and for trade in the cities and their surrounding areas.	Guangzhou Economic and Technological Development Zone, etc.
5	National High-Tech Industrial Development Zone	Such a zone is a national science and technology industrial park approved by the State Council of China to accommodate knowledge-intensive industries. Making full use of open environmental conditions and domestic science and technology, such parks fully absorb foreign advanced scientific and technological resources, funds and management tools.	Nanjing High-Tech Industrial Development Zone, etc.
6	Special Customs Supervision Zone	A region established within China to implement specific economic functions by closed supervision, is given a special function and policy that promotes the transfer of international industries and creates linkages between domestic and international markets.	Beijing Tianzhu Free Trade Zone, etc.
7	Border Economic Cooperation Zone	An area for a border city in China to develop border trade and process exports	Dandong Border Economic Cooperation Zone, etc.
8	National Tourist Resort	A National Tourist Resort is located within a well-defined geographic boundary. It allows for the construction of ancillary facilities and should be built in areas that feature abundant tourism resources and attract a large number of tourists.	Taihu National Tourist Resort Zone in Wuxi city, etc.

Table 1: Major types of industrial parks in China

[7] Note: A new type of industrial park granted a relevant title upon the completion of certain procedures. It adheres to the concept of the circular economy, the principles of industrial ecology, the requirement of clean production, and conforms to the "Standard for National Eco-Industrial Demonstration Parks".

[8] Note: An area that promotes independent innovation and seeks to develop high-tech industries, by accumulating the requisite experience. It is a national high-tech zone of strong innovation capacity.

National development zones are considered relatively well developed and representative industrial parks in China. Therefore, this report focuses on analyzing the experiences of national economic and technological development zones (development zones), national high-tech industry development zones (high-tech zones), and special customs supervision zones for the following reasons:

a. China's development zones, high-tech zones and special customs supervision zones were established to learn from international experiences, explore mechanisms for opening up market and promote industrial development. They are similar to existing types of parks in other countries and have a greater chance of being rolled out.

b. In terms of the level of development, fully-fledged national economic development zones, high-tech zones and special customs supervision zones are considered the most successful and represent the highest level of development among China's industrial parks. Their construction standards and development models can be promoted and replicated in other countries.

c. The three types of parks are the largest in terms of number and geographic coverage in China. They also perform various functions and cover almost all types of national industrial parks; their experiences and models are therefore worthy of disseminating to other countries.

d. Having witnessed the entire history of China's industrial park development, these three types of park serve a significant exemplary purpose for parks in different stages of development in various countries.

1.4 METHODOLOGY OF THE STUDY

First, we carry out a comprehensive description and analysis on industrial parks. This is based on relevant documents, statistics released by the authoritative state agencies, information provided by the various parks, as well as the information collected from the field visits and interviews. The report provides a descriptive summary and systematic analysis of national development zones, high-tech zones and special customs supervision zones.

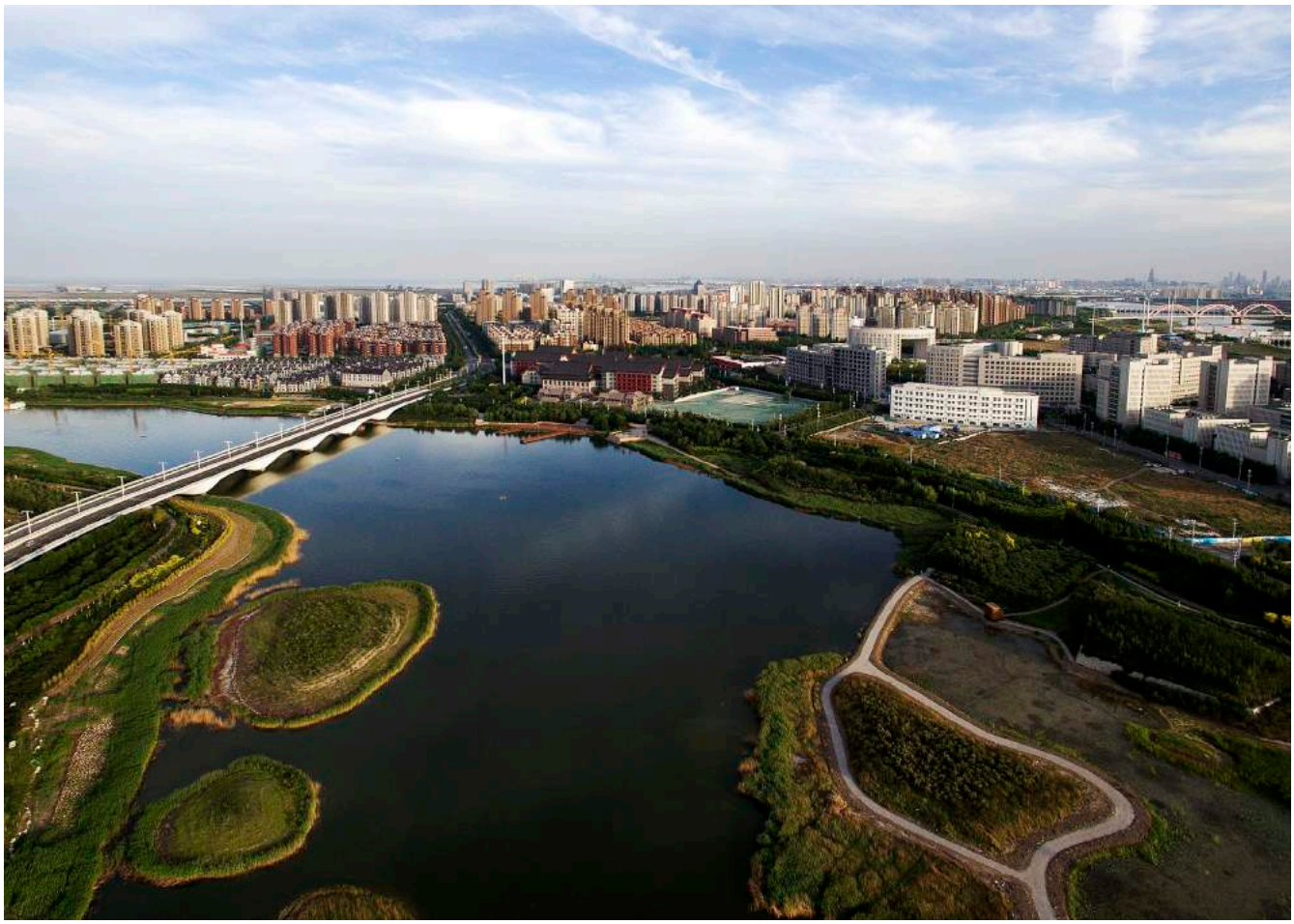
Second, comparative case studies are conducted by elaborating on the construction criteria and development models of national development zones (such as Suzhou Industrial Park) and high-tech zones (such as Zhongguancun Science Park). The report summarises and takes stock of the characteristics of China's park development while referring to the results of field research in foreign parks.

Third, both induction and deduction analysis are conducted. Based on the stocktaking of various types of parks in different phases of development and of different development models, this report elaborates on the construction characteristics, the particular features of different phases, the policy impact and business environment of the national development zones, high-tech zones, and special customs supervision zones. A deductive analysis serves to summarise China's successful experience of developing national industrial parks. On the basis of the summaries, the report proposes a set of guidelines and best practices that can be replicated, scaled, and used for reference in industrial park development elsewhere.

1.5 STRUCTURE OF THE STUDY

The study is organized into seven sections, namely, Introduction; Industrial park development preparatory work; Industrial park planning and construction; Park management; Marketing and investment promotion; Industrial park operation and management; and Industrial park performance evaluation.

Section 1	introduces the background, methodology and scope of the study.
Section 2	focuses on the development objectives and the necessity of building an industrial park and location/site selection.
Section 3	identifies and summarizes a set of plans, namely an industrial plan, a control plan, a construction plan, and an investment and financing plan in the course of the park construction.
Section 4	highlights various industrial parks' management models and relevant legal issues.
Section 5	provides an overview of a service platform and preferential policies, in order to recruit companies to move their production and business operation into the parks.
Section 6	explains the operation and maintenance of infrastructure, personnel support, scientific and technological innovation, education and medical services, community development, waste treatment, etc.
Section 7	examines the significance of evaluation, evaluation system, and implementation procedures of the park performance evaluation.



SECTION 2

INDUSTRIAL PARK PREPARATORY WORK

2.1 OBJECTIVES OF ESTABLISHING AN INDUSTRIAL PARK

There are various reasons behind the government of China's pursuit of the development of industrial parks. The ultimate objective is to drive regional development because industrial parks are capable of achieving various socio-economic and environmental objectives. At the initiation stage of an industrial park project, the following objectives are usually considered:

a **Economic gains –** these include both the direct revenue and indirect gains that boost the regional economy.

- Direct economic contribution of an industrial park includes:
  - Growth of GDP and fiscal revenue;
  - Improving the added value of manufacturing;
  - Incubation of new businesses or industries;
  - Attracting domestic capital and foreign direct investment; and
  - Growth of import and export volume and value.
- Potential structural changes in regional economy include:
  - Promoting investment from small and medium-sized enterprises (SMEs);
  - Improving industrial clustering and supply chain extension; and
  - Achieving innovation-driven development.

Index	2017 (January to December)	
	Total amount (100 million Yuan)	Growth rate (%)
Regional GDP	NA	9.5
Industrial added value above designated size	NA	10.6
Added value of tertiary industry (service industry)	NA	5.7
Output value of strategic emerging industries	NA	17.1
Fixed asset investment	NA	13.0
Industrial investment	NA	16.9
Technical renovation investment	NA	10.8
Investment in the large, strategic emerging and special projects	300.4	27.3
Total retail sales of consumer goods	151.1	NA
Total imports and exports (USD 100 million)	77.7	28.8
Total imports (USD 100 million)	28.7	43.9
Total exports (USD 100 million)	49.0	21.3
Per capita disposable income of urban permanent residents (RMB)	35,204	9.1

Table 2: Development targets of the Hefei Economic and Technological Development Zone [9]

b **Social benefits –** these objectives refer to non-economic social benefits, referring to industrial parks' social contributions and their impacts on the macro level. They include:

- Improving the local population's skill level and increasing the proportion of locals in higher education;
- Reducing unemployment; and
- Promoting public services and urban development.

It is worth to note that China's industrial parks also play an important exemplary role in institutional and systemic reform.

The Changchun Economic and Technological Development Zone was established in 1992. It was approved by the State Council as a national economic and technological development zone in 1993, becoming one of the first 49 national economic and technological development zones in China. It covers an administrative jurisdiction area of 112 km^2, and has 300,000 permanent residents. In 2017, it published the following development goals.

In terms of business start-up, employment and labour security, the goals were creating 16,500 new jobs (including 12,000 urban jobs), putting 3,450 laid-off people back to work, helping to employ 360 people having difficulty in finding jobs, and increasing the registered employment rate for college graduates to 85%.

With respect to services relating to people's wellbeing, the goals were building community service centres, renovating social service centres, building community service facilities, renovating and expanding the Xinglongshan welfare centre, and increasing investment in public goods, such as purchasing snow removal equipment and maternal and child care equipment. Moreover, the Zone aimed to improve the community service platform, the youth service platform, the "Internet + public security" service platform, the community service APP and government service capacity.

[9] Hefei government: Hefei NDZ's development objectives. http://www.hetda.gov.cn/xwzx/sjjk/201804/t20180420_2544393.html?COLLCC=1850876173&

In terms of social relief and security, a comprehensive service window featuring "one-stop acceptance and coordinated handling" was set up to improve the social relief service system, effectively providing temporary and special relief to people in need. Charity events were organized such as "Warm Winter", "Care for Life", and "Care for Veterans". The disabled were provided assistance for their rehabilitation, training, employment and entrepreneurship. Goals relating to public health, and maternal and child health care in particular, included improving access to the network of community health service centres, to allow residents to receive medical treatment in only 15 minutes. Similarly, education-related goals included building four new schools, proceeding with the construction of one school and the expansion of one existing school, improving and replenishing teaching equipment and rebuilding run-down school buildings.

Box 1: The Changchun Economic and Technological Development Zone releasing the objectives of social benefits [10]

C **Environment protection objectives** refer to the parks' good impacts on living conditions and the environment of the surrounding regions. They include:

- Reducing land waste;
- Saving more energy;
- Promoting a circular economy and achieving industrial symbiosis; and
- Eliminating major pollution accidents or ecological damage.

Located on the Yangpu peninsula in north-western Hainan province, the Yangpu Economic Development Zone covers an area of 31 km^2. It is a national development zone with a bonded zone policy approved by the State Council in 1992. During the 13th Five-year Plan period, the Zone put forward several major goals in terms of energy saving, emission reduction and environment protection. The goals included maintaining good air, water, and soil quality, maintaining key enterprises' leading position in energy efficiency and environmental protection, and eliminating backward production capacity. By 2020, energy consumption per RMB 10,000 of GDP is set to drop by 11% from 2015 levels. Total energy consumption is set to be below 4.1735 million tons of standard coal equivalent. Total chemical oxygen demand and ammonia nitrogen emissions in the region are set to be below 6,206 and 560 tons respectively and total emissions of sulphur dioxide and nitrogen oxide is set to be below 13,000 and 18,000 tons respectively.

Box 2: The Hainan Yangpu Economic Development Zone releasing the ecological protection objectives[11]

To sum up, although economic objectives are the fundamental driving force for the construction of industrial parks, they are not the ultimate purpose, as industrial parks also have explicit social and environment protection objectives. Maximizing comprehensive benefits is the ultimate goal of

[10] Changchun government: Social care from the government service. http://www.cetdz.gov.cn/

[11] Hainan Yanpu EDZ: Hainan Yanpu EDZ environment plan. http://yangpu.hainan.gov.cn/yangpu/0800/201708/bb5ab8612c41475eaeea0c0e2c449a37.shtml

industrial park development. Resource use and economic growth are both subject to the objectives of protecting environment, improving people's livelihood and ensuring sustainable economic development. Economic gains, social benefits and environment protection objectives are organically integrated. Therefore, from the outset, China pays full attention to the synergy of different objectives and devises a comprehensive assessment to prevent the park from exclusively pursuing economic objectives at the expense of other types.

2.2 LOCATION SELECTION

The selection of an industrial park's location is determined by comprehensive factors, and we have seen different decisive factors throughout the development of these parks. In the early years of the reform and opening up policy, industrial parks served an important role for foreign economic cooperation and testing institutional innovation. In July 1979, four pilot SEZs were built in Shenzhen, Zhuhai, Shantou and Xiamen, all were locations characterized by their proximity to the coast, Hong Kong and Macao. Their geological conditions also allow them to be enclosed. The choice of the parks' locations was based more on the convenience of the proposed location for external exchange, risk prevention and control.

The factors influencing location selection began to shift towards "driving regional development" in the 1990s, with the deepening of China's reform and opening up policy and the development of industrialization. Between 1992 and 1994, the State Council approved 18 development zones in Wenzhou, Yingkou, Fuqing, Shenyang, Changchun, Wuhan, Wuhu, Hangzhou and other cities. After 1999, a number of provincial capitals in central and western regions established development zones, marking a shift from costal to inland areas, and from developing a 'point' to developing an entire region.

The coverage of high-tech zones was also expanded throughout China after the 1990s. Before the 1990s, China had only one high-tech zone in Beijing, but since 1991, high-tech zones have been built in large talent-intensive cities such as Shanghai, Nanjing and Guangzhou. By 1992, there were high-tech zones in every province of China's mainland with the exception of Tibet, Qinghai and Ningxia. High-tech zones have played an important role in industrial expansion and regional economic growth.

2.3 SITE SELECTION

Site selection for an industrial park is based on several interrelated factors. The first consideration is the availability and suitability of land, which is the most basic material guarantee for the industrial park's success. This consideration includes topography, landforms, natural disaster frequency, engineering geology, hydrogeological conditions, etc. A second consideration is the connectivity potential of the site, as transportation is one of the most direct factors influencing the industrial park development's cost and efficiency. The industrial park should therefore be located close to a transportation hub, (i.e. main entrance of traffic, port, etc.) in order to optimize the flow of people and goods and achieve the extension of space. The third consideration is infrastructure conditions, including the water supply system, the heating system, the power supply system, the sewage system, the communication transmission system, oil and gas pipelines, etc. The fourth consideration is the supply of labour. Whether the available labour force is sufficient or not is determined by the level of local public services, transportation and industrial agglomeration.

It is worth noting that the relative importance of each of the factors will vary according to the type of industrial park. For example, spatial links and synergies with universities and research institutes are crucial for the development of high-tech parks, whereas access to a low-cost labour force and connectivity with a

transportation hub are more crucial for industrial parks specialized in manufacturing.

The relationship between the park and the city must also be considered in site selection. At the outset of China's industrial park development, parks were usually built far away from the city. The advantage to choosing such location was due to the low cost of land, but this necessitated a considerable investment in infrastructure. In recent years, industrial parks located in city suburbs and even within cities have gradually become mainstream, owing to advances in industrialization and urbanization. Parks built within city limits rely on the city's existing infrastructure and service facilities, which means comparatively less infrastructure investment and easier access to labour. However, land within city limits is scarce and expensive, a factor which limits the developmental potential of the park. Therefore, sites within city limits are more suitable for industrial parks that require less land and accommodate non-polluting industries, such as high-tech development parks that produce high value-added and technological products. Sub-urban industrial parks can benefit from abundant yet not expensive land in suburbs and take advantage of urban markets, existing infrastructure and transportation facilities. Today, most of China's industrial parks are located in sub-urban areas.

2.4 FEASIBILITY STUDIES

The feasibility study will analyse and compare the political, economic and social benefits that the park could bring. This study will lead to a decisive conclusion as to whether to establish an industrial park. The feasibility study is generally composed of the following elements:

a. **A basic analysis of the local economy and social development -** Major factors include: the locational advantage and transportation conditions of site; the economic profile (size, speed of growth, distribution of industries, competitiveness), social development status (population size, level of education, living conditions) and historical tradition and cultural origin. The local development capacity must be given full consideration in order to fully understand the necessity of building an industrial park, the basic direction for its development as well as the potential pitfalls and risks.

b. **Analysis of the macro environment -** This includes an analysis of the policy environment, economic environment and market environment. The policy environment analysis assesses whether the building of an industrial park aligns with national and regional development strategies, while the economic and market environment analysis assesses domestic and international economic environments and market demand, and weighs the necessity of an industrial park and the possible development opportunities.

c. **Analysis of industrial selection -** The analysis of industrial selection mainly considers how the park's industrial positioning, industrial system, industrial structure, industrial chain and spatial layout will be impacted by the past, present and future of industrial development in China and industrial development impact from other countries. To identify the target industries with the most development potential, the analysis should look for the intersection of various indicators such as market prospects, regional development, industry development trends and national industrial policies. The key to the analysis is whether it can accurately define the core industries, key industries and auxiliary industries in an industrial park so as to form a sustainable ecosystem for the park's industries on this basis.

d **Analysis of resources and environmental carrying capacity -** The main consideration of this analysis is the synergy between the industrial parks' potential impacts on the environment and the supply capacity of energy and resources for the industry. For example, feasibility studies for sensitive chemical industrial parks include assessments of potential environmental impacts, such as: (1) an evaluation of the location of the proposed site in relation to major environmentally-sensitive areas;[12] (2) determining whether the layout of the industrial park's infrastructure such as sewage treatment, solid waste treatment facilities and underground pipelines is in line with local and national environmental protection targets or not; (3) assessment of environmental protection and pollutant control capacities, including the capacity to address potential risks and accidents (as well as their negative environmental impacts) and identify the need for capacity building; and (4) an examination of the feedback and participation level of the local residents.

e **Cost-benefit analysis for the construction -** This is an estimation of the overall investment during the construction stage of the industrial park, consisting of an analysis of the investment timeline, construction costs, financing plans, and solvency.

f **Risk assessment -** Risk assessment refers to an analysis of undesirable circumstances for building an industrial park, such as competition from existing parks in surrounding areas, or gaps in talent, supporting facilities for industrial chains, and public services in this region. The risk analysis covers three dimensions:

- **Uncertainties relating to the construction and operation of industrial parks,** such as under-financing, lack of enterprises, lagging development of pillar industries, changing market demand, fluctuating exchange rates, etc. The purpose of tracking these risks is to determine the tolerance capacity for construction risks, and make an effective contingency plan for profits and losses.
- **Adverse impacts arising from the construction and operation of industrial parks,** such as negative feedback from local residents or interest groups and conflicts relating to energy or other resources. The purpose of tracking these risks is to improve the park's operational supervision system to minimize risks.
- **Possible long-term or extreme impacts industrial parks may encounter during their development,** such as changes in natural conditions, government policies, the external economic situation, etc. Assessing these risks can help set up a standard threshold and risk mitigation plan.

[12] Note: According to "the Opinions on Intensifying the Environmental Protection of Chemical Industrial Parks" issued by the Ministry of Environmental Protection of China, it is prohibited to set up a chemical industrial park in highly populated residential areas, key eco-functioning zones, nature conservation zones, drinking water source protection zones, basic farmland preservation zones, and other environmentally sensitive zones. The site of chemical industrial parks should be located in a reasonable distance r from major environmentally-sensitive areas

SECTION 3

INDUSTRIAL PARK PLANNING AND CONSTRUCTION

3.1 TYPE AND LEVEL OF INDUSTRIAL PARK PLANNING

There are three categories of plans under China's existing industrial park planning system. The first category is economic and social development plans under the National Development and Reform Commission (NDRC). The second category is space control and construction plans under the Ministry of Natural Resources, and the third category includes all kinds of special plans, such as environmental protection plans under the Ministry of Ecology and Environment, tourism development plans, and cultural relic protection plans under the Ministry of Culture and Tourism. All three categories are formulated at national, provincial and municipal administration levels. National-level plans always prevail in terms of planning hierarchy, while lower level-plans are modified and improved based on regional development circumstances and development objectives.

Plans for the development of an industrial park are formulated at the municipal level. Therefore, plans for industrial development and space construction should be formulated to meet the demand for economic and social development and space control stipulated in the economic and social development plan and the host city's master plan. The investment and financing plan should be developed to ensure adequate funding for the park. For any other special needs, the park may develop other special plans. This study will succinctly describe only the industrial development plan of the park, the space construction plan and the investment and financing plan. Some of the legal documents that guide China's industrial park planning include:

- The Urban and Rural Planning Law of the People's Republic of China
- Methods for Urban Planning Formulation
- National Economic and Social Development Plans at various levels
- Urban-Rural Master Plans at various levels
- Master Plans for Land Utilizations at various levels
- Laws and regulations on environmental protection
- Laws and regulations on industrial policies, foreign trade and investment

3.1.1 Industrial development plan

The industrial development plan for a park represents a systematic elaboration of the park's positioning, industrial chains, industry segmentation, as well as industry deployment and development strategies. It is a future-proof plan to guide the park's sound industrial development aiming to ensure heterogeneity, competitiveness, longevity, stability and sustainability.

Formulating the industrial development plan is necessary for implementing the upper-level plan for economic and social development in the host city and improving the quality of the parks' development. The plan should be founded upon the optimization of the park's comparative advantage, the promotion of regional economic growth, the enhancement of competitiveness and the promotion of investment in the park. The industrial development plan serves as the fundamental guiding document for the planning of its construction and the ensuring of environmental protection.

The formulation of a sound industrial development plan is composed of the following elements.

a **Status of industrial development and trend analysis –** The plan should systematically review the local economic and industrial development, including development level, industrial structure, industrial division of labour, trend of industrial relocation, and environmental constraint of supplying resources. Proceeding from industrial and capital transfer in China and abroad, as well as regional economic development, the plan should summarize the impact of the regional business environment for industrial development and what it can offer to the park. It should also describe the status of local industrial development (such as size of the industries, enterprises and industrial structure) and pinpoint any current problems. Lastly, this plan maps out the overall blueprint for industrial development in the park, including industry clustering, function positioning, development models, operation mechanisms etc. It should clarify industrial development objectives in the short-, medium- and long-term and set planning deadlines.

b **Positioning of leading industries –** Based on an interpretation of upper level planning, the industrial development plan should carry out a comparative analysis of all industrial parks in the region, and apply a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis to identify their relative strengths and weaknesses at the regional level. The plan should also clarify the orientation of industrial development and industry categories, analyse the strength of industry based on average input/output data and economies of scale, and impartially assess the overall strength of each category. On the basis of a regional comparative analysis and an analysis of the park itself, the plan should decide on the position of the leading industry and the pillar industry. It should define the leading industrial cluster to be fostered, and determine its guiding concept and path of development, cluster composition and the priority fields in the cluster.

c **Industrial plan –** The industrial plan should specify the sizes, functions, features, and categories of the industries in the park as per the positioning of the leading industry and the demand of the upper level planning for regional industrial development. Key discussions should be had about how to upgrade the park's industrial structure by developing its leading and relevant industries. This will in turn drive the upgrading of the regional industrial structure. The plan should set short-term and long-term objectives for industrial development, including objectives for the total volumes, structures, technology innovation, business incubation, environmental constraints, etc. Lastly, it should propose guiding concepts, paths, compositions and priorities for the development of each industry in the park.

d **Implementation of the development strategy**

- The plan should integrate multiple strengths and try to gain project and funding support from national, provincial and municipal governments to develop the industrial park in order to unleash the park's potential.
- It should enhance administrative efficacy and contribute to the approval and implementation of investment in volume and density, industrial policies, land use policies, planning permits, environmental requirements, engineering progress, incentive policies, etc.

- It should foster team-building, provide business training and devise detailed and actionable plans for investment promotion, including tasks, directions and objectives.
- It should foster a friendly investment environment in the park, improve its operation and management (including management system, industrial investment promotion, industrial investment, brand operation, incubation), define the target clients and build management and control mechanisms, etc.
- It should improve the institutional mechanism for recruiting talents in the park and strengthen the soft environment for talents development. The park should make full use of its comparative and competitive advantages, and adopt beneficial and development policies to attract innovative entrepreneurs. It should establish and enhance an inward flow of talent, and build an environment conducive to talent development. It should also promote the commercialization of scientific innovation and provide technical support to upgrading of the industrial structure.
- It should vigorously pursue green and low-carbon development during the implementation of the plan. A target should be set for the proportion of green industrial output to the total industrial output. Energy consumption per unit of GDP and water consumption per unit of GDP should be gradually reduced. The utilization ratios of renewable energy, energy recovery, clean energy coverage, water reuse, and rainwater collection and reuse should be increased.

3.1.2 Space construction plan

The space construction plan is critical to the implementation of the strategic arrangement of the urban master plan, and is an important means of controlling land and construction capacity, increasing the efficiency of land use and protecting the environment. This plan systematically states the objectives and principles of the park's construction in planning language, and serves as the technological guidance and scientific foundation for the park's construction and management.

Such a plan can be categorized into two plans subordinate to the urban master plan: the detailed plan for control, and the detailed plan for construction. The detailed plan for control specifies the size of land for construction, the nature of land use, intensity of land use, and space environment, etc., in line with the space control regulations set by the urban master plan for that particular area. The detailed plan for construction follows the detailed plan for control and provides guidance for constructing buildings and various engineering facilities within the park.

The detailed plan for control is generally composed of the following elements.

a **Size control –** The plan should meet the land-use control target in line with the urban land control plan, track the status of land use under the plan, and identify the positioning, development objectives and models of the industrial park according to the industrial development plan. Furthermore, it should also determine the size of the land for construction according to the estimated industrial and population sizes in the park. Lastly, it should formulate the rules for land use and building management.

b **Land function control**

- The plan should draw boundary lines demarcating the land used for different purposes within the industrial park, and lay out land functions according to industrial planning.
- It should identify the location of educational, scientific, cultural and health facilities and their services scope.

- It should specify the types of buildings permitted to be constructed and those buildings not allowed to be constructed as per each land use category, as well as construction suitability according to certain conditions.
- It should set underground and over-ground guidelines for large municipal passageways, such as high-pressure corridors, microwave channels, the metro, and airfield clearance zones.
- It should determine the layout and diameter of the engineering pipelines, and the boundary of engineering facilities according to the planned capacity.
- It should draw the health and safety and quarantine boundaries for facilities with particular impacts on the environment.

c **Land control indices**

- The plan should specify the main control indices of each plot such as the boundary lines and codes of land use, the maximum height of buildings, building intensity, floor area ratio, ratio of green space, etc.
- It should mark the traffic exits and entrances and parking spaces for each plot.
- It should set the boundary lines for roads and buildings, the near-line rate, the building interval, etc.
- It should determine the control points of each tier of roads, the co-ordinates, elevation, minimum turning radius, bus stations, parking lots, no-opening sections, underpasses and overpasses for pedestrians, etc.

d **Control of ecological indicators**

- It should stipulate the green space rate, the ratio of green space to the total area of the park, and provide a benchmark for the green space rate of each plot.
- It should stipulate the green coverage rate, the proportion of the total green coverage area to the total area of the park, and provide a benchmark for the green coverage of each area.
- It should stipulate the minimum proportion of green buildings and construction standards, and formulate the proportion of green buildings with different functions (including residential buildings, public buildings and industrial buildings).

e **Control of environmental indicators**

- It should provide the standard rate for environmental protection, including the standard rate for soil, water, air, noise, solid waste, etc.
- It should provide the rate of harmless treatment of pollutants, the utilization rate of waste resources, and calculate the allocation ratio of harmless treatment equipment for solid, gas and liquid pollution sources.
- It should stipulate the minimum required spending for environmental protection in proportion to GDP.

The formulation of detailed plans for park construction is composed of the following elements:

a **Analysis of the status and development conditions –** The plan should be in accordance with the policy context, development opportunities, and planning objectives of industrial park development. It should set guidelines, principles and legal grounds for park planning. It should also set a timeline for the planning and construction of an industrial park and determine the scope of the planning. Moreover, the plan should describe the geographic location and administrative zoning in detail, as well as the overview of its economy, society and natural condition (such as topography, physiognomy, geology, climate, hydrology, soil, population and transportation).

b **Scale and layout of to-be-used land –** The plan should lay down the planning principles of land use, and execute these in the construction space according to the requirements of the park's upper-level plan and industrial plan. It should also properly allocate land for residential buildings, public administration and public service facilities, commercial service facilities, industry, logistics and warehousing, road and transportation facilities, green space and plazas. Such an allocation should comply with the needs of industrial development.

c **Design guidance**

- **Guidance for eco-landscape design –** this guidance outlines the eco-landscape corridor, plans for open space and a green landscape system in the industrial park, and instructs the selection of plant species for the eco space.
- **Guidance for the design of cultural facilities and space –** this guidance outlines space for facilities related to cultural activities, and instructs the design of cultural facilities and the style of cultural space.
- **Guidance for the design of the structures –** a unified guidance for the design of size, shape and style of facilities for advertising boards and sculptures.
- **Guidance for the colours –** guides and specifies the colours of the exterior walls of the buildings, and the dominant hue of the structures.

d **Special plans**

- **Road traffic plans –** planning the three-tier road network including artery roads, secondary roads, and access roads, properly designing the traffic lines for work and leisure, and separating industrial traffic systems from local traffic systems.
- **Green space system and water system plans –** planning a green eco-network in a coordinated way, properly controlling the proportion of green space to the public land, land for roads, land for courtyards, industrial land, and protective land, guiding proper development and use of natural ecological resources to maintain a good ecological environment, and increasing the size of carbon sinks in the park.
- **Environmental protection and environmental sanitation plans –** strictly controlling the pollutant discharge and putting hygienic facilities in proper compliance with national and local environmental protection standards. The plan outlines an environment for sustainable production and living by means of minimal pollution and the reuse of waste.
- **Municipal infrastructure plan –** making comprehensive pipeline planning according to the various engineering requirements for water supply, drainage, rainwater, sewage, reclaimed water, electric power, telecommunications, gas and heating.

  Comprehensive disaster prevention plan – identifying the grades and facilities to prevent flooding, water logging, and earthquake damage and detailing the measures for mitigating disaster demages according to local geological conditions. It plans for fire prevention, civil air defence and land subsidence.

3.1.3 Investment and financing plan

The investment and financing plan analyses the total costs and returns for various stakeholders in the construction and operation of the park according to relevant laws, regulations, polices and plans. It seeks to materialize the industrial development strategy and space planning, and targets the investment and financing of various industrial facilities, infrastructure, and public service facilities.

In the market economy, capital plays an important role in the planning and construction of the industrial park. In the early phase, the government's ability to make investments, expedite financing, and attract foreign investors can, to some extent, determine the

industrial park's ability to attract capital-intensive and technology-intensive industries. This will in turn influence how the park positions itself and how the industries within it orient themselves. Therefore, the investment and financing plan is critical to the park's industrial development plan and space construction plan. It links the planned construction with the project funding, and ensures that various plans can be smoothly executed.

The formulation of detailed plans for the investment and financing of an industrial park is composed of the following elements:

a **Investment and financing environment and stakeholder analysis –** The investment and financing plan should state the investment climate, including political factors (peace and stability of the country and region, investment risks), market factors (market composition and capacity, people's consumption pattern and habit), resource-related factors (resources reserve, exploitation and utilization), labour factors (the quantity and quality of labour), and other factors (managerial expertise and the ability to make use of advanced technologies). The plan should carry out a quantitative assessment of all the stakeholders such as the local government, the park's management committee, financial institutions, private investors and residents, and should also conduct financial modelling. Furthermore, according to the current laws, regulations and planning frameworks, it should carry out financial forecasting to calculate the point at which the interest of all stakeholders can be balanced so that the funding can effectively match the requirements of the project.

b **Investment and financing model and channel analysis –** Above all, the investment and financing plan should clarify investment boundary, i.e. the entity (government or market entity) that invest in the industrial park. A clearly-defined boundary can balance the interest relations between government agencies and market players so as to design the right development model to control risks, increase profitability and stabilize expectations. In addition, the plan should also select an appropriate investment and financing model such as BOT (Build-Operate-Transfer), BT (Build-Transfer), TOT (Transfer-Operate-Transfer) and PPP (Public-Private-Partnerships) on the basis of the features and funding needs of various development projects. Moreover, based on the selected model, the plan should identify one or multiple financing channels. These could be internal and external sources of financing, direct and indirect financing, debt and equity financing, such as bank loans, bonds, shares, seed funding, venture capital, public equity or private equity, or self-financing by the enterprises.

BOT (Build-Operate-Transfer) - The most prominent feature of this model is to mortgage the operation right of the project for a limited period of time in order to obtain project financing, in other words, to privatize the operation of the state-owned infrastructure projects.

BT (Build-Transfer) - This is a type of investment model for the construction of infrastructure projects based on an agreement signed between the investor and the project sponsor. The investor is responsible for project financing and construction, and transfers the completed project to the sponsor within a prescribed timeframe. The project sponsor pays the investor the total investment amount and the set returns according to the repurchase agreement signed beforehand.

TOT (Transfer-Operate-Transfer) - This is a new financing model in which the existing assets are sold to obtain the incremental capital needed to finance the new project. Under this model, the private enterprise first uses its private capital or funds to purchase all or part of the property rights or operation rights of a certain asset. The buyer then develops and builds the new project, and after running the project within the agreed period, recovers all of the investment plus some reasonable profits. After the concessionary period ends, the buyer transfers the property rights or operation rights of the project back to the original owner.

PPP (Public-Private-Partnerships) - This model is primarily applied to infrastructure and other public projects.

Firstly, a government-chartered project company is established for a specific project with supporting measures provided by the government. Then the project company is charged with responsibility for project financing and construction. The sources of financing include the project capital and loans. When the project is completed, the government-chartered enterprise will develop and operate the project, whereas the lender can obtain the direct earnings from project operation and the economic benefits arising from the government support.

Box 3: Investment and financing models

c **Estimation of the size and cost of investment and financing –** The investment and financing plan should estimate parameters such as the industrial parks' asset output rate, asset liability ratio, and the share of venture capital in net asset terms. Secondly, it should calculate the total size of investment and financing by applying the necessary parameters and following the output target and growth rate required by the upper-level economic and social development plans. The estimated result can facilitate the industrial park management committee's budgeting and help further estimate the size of the required investment and financial service. Lastly, it should properly estimate the cost of this investment and financing. The cost estimate should consist of explicit costs (i.e. financing charges), capital costs, and implicit costs (i.e. opportunity cost, risk cost and agency cost).

d **Profit model analysis –** The investment and financing plan should set the possible profit model based on the type and development level of an industrial park. For instance, profit could derive from land appreciation, leasing income, commercial property, or residential property. The profit model also includes profits from value-added services in the park, such as industrial technologies, services supporting industrial development and people's livelihoods. Secondly, the plan should set different profit models for the different stages of an industrial park, including short-term, medium-term and long-term models. Profitability and profit models for industrial parks depend on the park's development stage. In the early stage of development, industrial parks' profits mainly derive from the lease or sale of land, whereas industrial parks at an advanced stage (i.e. operational stage) need to expand the channels for profit, and see a significant increase in the share of value-added services in their total profits. Finally, the plan should include relevant rules to regulate various profit channels of an industrial park, and ensure that its profitability is robust, sustainable and stable, and the operational risks are under strict control.

3.2 INDUSTRIAL PARK CONSTRUCTION AND IMPLEMENTATION

3.2.1 Preparatory work for construction

A Stewardship Committee for industrial park construction, representing the local government, should be established to effectively lead and coordinate park construction, and address related issues. During the preparatory stage, the Committee should specify the roles and responsibilities of each functional department. These include, but are not limited to:

- Executing the industrial plan, spatial plan, investment and financing plan, and all other plans of the industrial park;
- Communicating the project information to relevant stakeholders;
- Coordinating and inspecting construction on a regular basis;
- Convening coordination meetings and overseeing the execution of meeting decisions regularly;
- Reporting on and promoting the progress of park construction.

3.2.2 Construction and implementation stage

At the construction and implementation stage, the Stewardship Committee undertakes the following tasks:

- Providing compensation and indemnity for land acquisition, demolition, and earthwork. According to the relevant Chinese laws, the right to use state-owned land must be publicly transferred to the society through bidding, auction or listing. In most major cities, the leasing period for industrial land generally does not exceed 20 years and a flexible leasing system is implemented. The assignment period, limited to 20 years, is determined according to the actual condition of the industrial park (i.e. location of the park, decision of the local government) .
- Conducting negotiations, appraisals and identification, ensuring work safety and social stability, and organizing implementation in relation to land acquisition, housing demolition and relocation;
- Conducting negotiations and evaluations and providing compensation in relation to the reallocation of enterprises;
- Organizing surveying and boundary demarcation, ground levelling, and laying piping;
- Being responsible for the bidding and tendering of the construction projects in the industrial park;
- Raising and allocating the funding required for infrastructure construction and other projects and ensuring the funding for daily work in the industrial park;
- Processing the procedural work for the signing of agreements in relation to the companies and projects in the industrial park, assisting companies' registration with industry, commerce and tax authorities, and assisting them with project application and record filing;
- Processing environmental protection-related procedures and assisting the companies' environmental impact assessments;
- Being responsible for supplying labour to the projects, employee social insurance, and employee training for specific posts.

3.2.3 Construction assessment and acceptance

The Stewardship Committee should be aware of the problems that arise during construction, keep track of the progress of park construction, and produce inspection reports on a regular basis. During the assessment and acceptance phase of the industrial park, a task force responsible for assessment and acceptance should be set up to do the following tasks:

- Convening project acceptance meetings to hear the briefings on the industrial park's work organization, construction and any problems;
- Inspecting the relevant companies in the industrial park and gaining on-site knowledge about their work progress;
- Reviewing the submitted construction materials item-by-item, according to the construction objectives and evaluation indicators, making necessary inquiries, and scoring each item as per requirement;
- Submitting the notification of acceptance and providing comments and suggestions for future work.

In China, land development and land preparation for construction regulations are derived from the government's "three connections and one levelling" requirement. Construction regulations have gradually evolved with the continuous upgrading of construction requirements (or the diverging construction requirements related to the engineering projects). So far, construction standards have been extended from the original "three connections and one levelling" requirement to "thirteen connections and one levelling" requirement. It is worth mentioning that the concept of "one levelling" in the case of "thirteen connections and one levelling" requirement is not an absolutely uniform standard. The usage of the term "levelling" is relative and contextual, depending on different scales, regions and projects. China's infrastructure construction regulations have evolved through the following stages:

Three connections and one levelling – This refers to the preconditions for commencing infrastructure construction projects, namely the availability of water (referring to water supply), electricity (referring to access to electricity at the construction site), road (referring to motor vehicle accessibility, with roads outside the construction site paved all the way to the site entrance), and the ground levelling of ground (whereby the construction ground for the buildings proposed is basically flat, and need not be levelled by machine but by simple manual levelling). "Three connections and one levelling" is mainly for the purpose of paving the way for construction contractors to enter the site and begin construction.

Five connections and one levelling – As part of the preparatory work for making reasonable and orderly progress in construction, "five connections and one levelling" generally includes access to water, electricity, roads, communications, rainwater drainage and levelling of the ground. It is mainly used for the purpose of paving the way for construction contractors to enter the construction site. 'Communications technologies' and 'rainwater drainage pipes or ditches' were added to the list following technological advancements.

Seven connections and one levelling – This refers to the condition of the land (raw land) after primary development where there is water, electricity, heating, gas, rainwater and sewage drainage, telecommunications and road, and level ground, so that secondary developers can enter the site and rapidly begin further development and construction.

Nine connections and one levelling – This includes the availability of electricity, roads, tap water, telecommunication, rainwater drainage, heat, gas, domestic sewage drainage, cable TV and level ground. This requirement is more relevant to the construction of civilian buildings. It provides the necessary and basic conditions for attracting investment to the development zones across the country. This requirement goes far beyond the conditions needed by the construction contractors. It contains the conditions required by all relevant parties and users of the project.

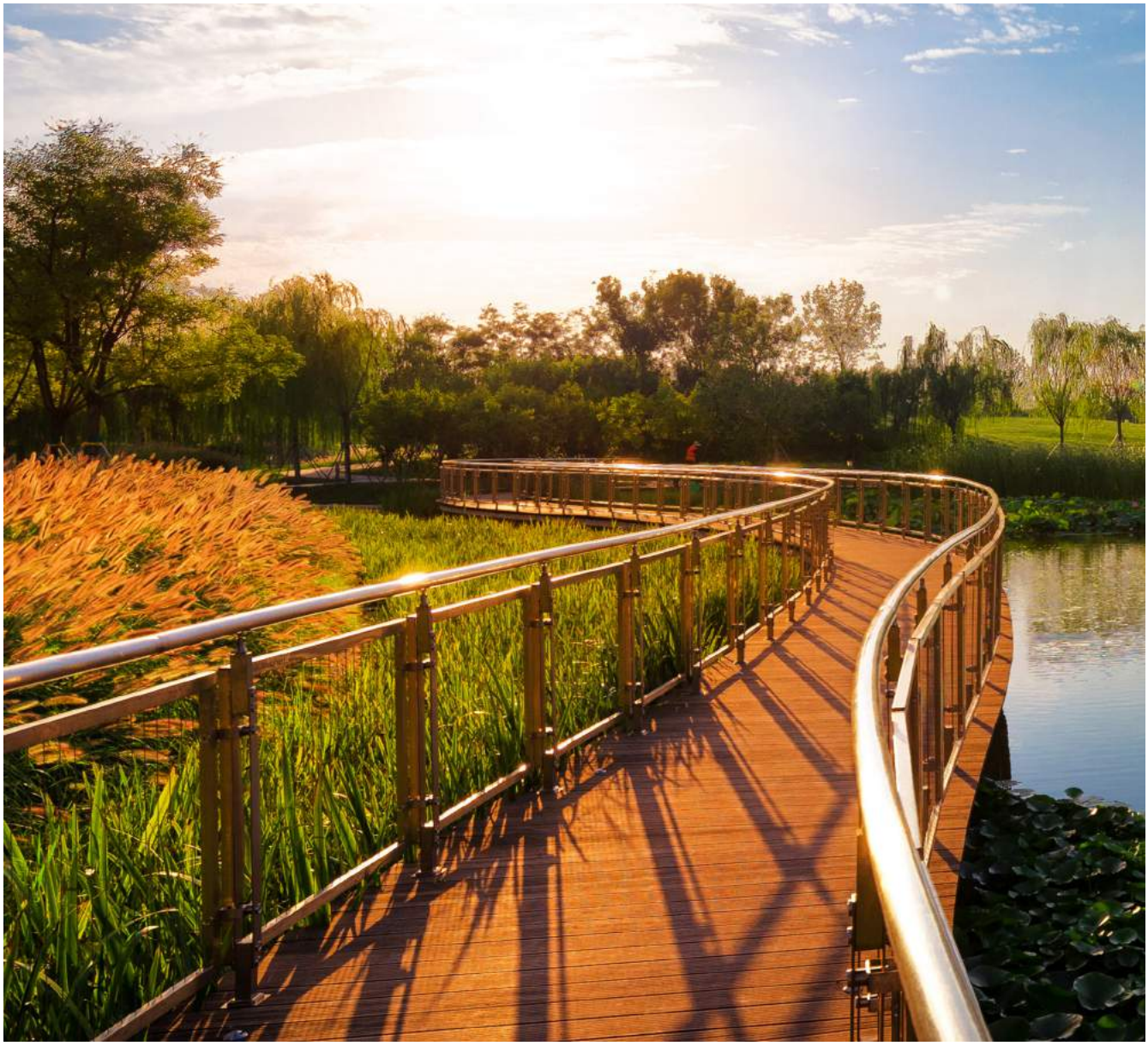
Ten connections and one levelling – This includes the availability of electricity, municipal roads, tap water, communications, rainwater drainage, heating, gas, domestic sewage drainage, cable TV, firefighting facilities and level ground. Compared to "nine connections and one levelling", this standard includes public water pipes for municipal firefighting and a fire hydrant piping network.

Eleven connections and one levelling – This includes the availability of electricity, municipal roads, tap water, telecommunications, rainwater drainage, heating, gas, domestic sewage drainage, cable TV, firefighting facilities, reclaimed water and level ground.

Twelve connections and one levelling – This includes electricity, municipal roads, tap water, telecommunications, rainwater drainage, heating, gas, domestic sewage, cable TV, firefighting facilities, recycled water, railway and level ground. For example, automobile manufacturing requires a powerful logistics system to guarantee the entry and exit of goods. The "railway" freight transport connection is added in order to help mega-factories reduce huge logistics expenses in the development zone.

Thirteen connections and one levelling – This includes the availability of electricity, municipal roads, tap water, communications, rainwater drainage, heating, gas, domestic sewage, cable TV, firefighting facilities, reclaimed water, railway, subway and level ground. Access to a subway is added with the objective of improving the investment environment, and greatly enhancing the development zone and the city's attractiveness. These conditions cover the infrastructure and public works needed for production, living, construction, operation, logistics and other processes.

Box 4: Evolution of China's infrastructure construction regulations



SECTION 4

INDUSTRIAL PARK MANAGEMENT

4.1 INDUSTRIAL PARK MANAGEMENT MODELS

China's industrial parks have come a long way, benefiting from both the evolving institutional environment under the reform and opening-up policy and the unique management models created through constant exploration. In practice, the parks have innovatively diversified the management models to facilitate industrial clustering, industrial symbiosis, administration management, risk management, the delivery of public services, as well as debt-financed and equity-financed development. Furthermore, having taken China's national conditions and prevailing international practice in industrial park management into account, China's industrial parks have created three management models with unique characteristics. These models include: industrial park management by management committee, integrated management by both the management committee and local government, and corporate management.

4.1.1 Management committee model

Currently, most of China's industrial parks have adopted the management committee model. This lean and efficient model features a centralized administrative body, whereby the local government or government agencies directly manage the park, highlighting the important role that government plays in the industrial park's management. In the overall organizational framework, the management committee is a subsidiary agency of the local government rather than a people's government itself. It performs the function of economic management under government mandate. There are seats in the management committee for senior government officials and the management of the industrial park is mandated to senior management. The organizational structure of the management committee is simple, and the departments with related functions are co-located. Furthermore, national development zones normally have the power to collect tax, make and implement their budget, formulate special normative documents for regional management, and govern the industrial park according to the legislation.

4.1.2 Integrated management model

There are two types of integrated management model: vertical entrusted management (entrusted by local government to manage surrounding sub-districts and townships) and horizontal integrated management

(integration of corresponding government agencies). Vertical entrusted management refers to a model whereby the local government entrusts the development zone to manage the economic and social development of the surrounding townships, and drive rapid economic growth in the surrounding areas, by creating a strong industrial foundation, establishing brand effect and creating new management systems. Horizontal integrated management refers to a model whereby the management functions of the development zone and those of the administrative jurisdiction are merged together, meaning the same groups of officials work for both missions. This horizontal integrated management approach gives more room for the development of the park so that the park and the surrounding region can complement each other in terms of talent, land, infrastructure, investment promotion and public service. Compared to other development zones or administrative jurisdictions, this model enjoys an unparalleled advantage by integrating policies and functions, and grouping administrative, economic and social affairs.

4.1.3 Corporate management model

Under the corporate management model, instead of establishing a dedicated administrative agency, the industrial park sets up a legal entity such as a development company and empowers this entity with the administrative functions necessary to organize and manage the park's economic activities. As a founder, investor, operator, beneficiary and risk-taker for the development zone, this company reports directly to the local government. Guided by the development strategy and government planning, it undertakes contracted operation, infrastructure development, fundraising, land development, business management etc. Meanwhile, the competent authorities of the local government are responsible for other administrative functions, such as public security, human resources, finance, tax, and administration of industry and commerce.

4.2 LEGAL GROUNDS FOR INDUSTRIAL PARK MANAGEMENT

Currently, the management of China's industrial park is grounded in the laws and regulations regarding the construction and operation of industrial parks under China's socialist legal system. These include laws adopted by the National People's Congress and its Standing Committee, as well as administrative and local regulations. Moreover, as a basis for park management, a typical industrial park in China makes its own management rules tailored to its own circumstances, with a view to complementing national laws and regulations and improving the legal and regulatory environment of the park.

4.2.1 National laws

China's industrial parks are subject to three tiers of national laws, including special legislation for the industrial parks, domestic legislation related to the parks, and special bilateral legislation between China and other countries.

a **Special legislation for the industrial parks**

China does not have national-level special legislation for industrial parks. However, a series of guiding documents and local regulations have been enacted, such as the *Regulations for Economic and Technological Development Zones in Shanghai Municipality*, which set forth basic provisions for the management systems and policies of industrial parks. Moreover, some management regulations keep abreast of to the most advanced management concepts at the time. They have helped drive the development of China's industrial parks, as well as the Chinese economy at large. For example, *Regulations for Zhongguancun Science Park (2001)* offered innovative

provisions that meet the economic development and new practices, typical of a mature market economy and knowledge-driven economy. These regulations represented innovations and breakthroughs compared to other laws and regulations in that period. In recent years, Shanxi and Jiangsu provincial governments, among others, have revised and promulgated provincial regulations for development zones. These regulations have provided legal provisions on the duties of development zones' management bodies, the operation mechanisms, industrial development, opening up and service delivery.

The *Development Zone Regulation of Shanxi Province* (hereinafter referred to as the Regulation) was deliberated and adopted at the second meeting of the 13th Provincial People's Congress on January 30, 2019, and officially came into force on March 1, 2019.

The formulation process of the Regulation

The regulation is adopted after going through three review processes. In September 2018, the fifth meeting of the 13th Provincial People's Congress Standing Committee conducted a preliminary review of the draft regulation. After the meeting, the Provincial People's Congress Financial and Economic Committee revised the draft on the basis of fully taking into account the committee members' opinions, extensively soliciting the opinions and suggestions of various parties, convening a symposium with experts from inside and outside the province, and paying study visits to places outside the province.

In November 2018, the seventh meeting of the 13th Provincial People's Congress Standing Committee conducted the second review of the draft regulation. After the meeting, the Provincial People's Congress Legal Committee, the Provincial People's Congress Standing Committee Legal Work Committee and the Provincial People's Congress Financial and Economic Committee, and the Provincial Department of Commerce, set up a draft revision group, and the draft was revised based on Standing Committee members' suggestions, research, argumentation and deliberation.

In mid-January 2019, the eighth meeting of the 13th Provincial People's Congress Standing Committee conducted a third review of the draft. During the deliberation, the members agreed that the draft had taken into account good ideas and suggestions put forward by various parties and was basically mature after repeated revisions. The meeting voted to adopt the decision to submit the draft to the second meeting of the 13th People's Congress of Shanxi Province.

Main contents and highlights of the Regulation

The Regulation consists of 10 chapters and 41 articles, including general provisions, planning and construction, establishment and change, management system, operational mechanism, industrial development, open cooperation, service guarantee, legal responsibility and supplementary provisions.

- **Purpose of legislation –** To standardize the management and services of development zones, facilitate the reform and innovation of development zones, give play to their functional advantages and leading role in opening up, and promote the economic transformation and development of the province.
- **Scope of application –** The Regulation is applied to the planning, construction, establishment and change, management operation, industrial development, open cooperation, service guarantee and other related activities of the national and provincial development zones. The Regulation clarifies the orientation and the role of the development zone and requires it to adhere to the new development philosophy and the principles of high-quality development.

- **Legal status of the development zone management agency –** The development zone is managed by the designated agency of the local government at county level or above. Innovation with regard to the management system of the development zone is encouraged.
- **Responsibilities of the development zone management agency –** The development zone management agency exercises economic management and necessary administrative management power, as well as some other powers conferred upon it. Article 18 of the Regulation stipulates that the relevant municipal government should streamline or spin off some of the development zone management agencies' social functions, so that the management body can focus on economic services.

Operation mechanism of the development zone – The operation of the development zone is directly related to the development efficiency of the zone's tenant enterprises and the zone's overall competitiveness. In Article 24 of the Regulation, the advanced experience of development zones in recent years is summarized and turned into a regulation; and requires the implementation of a service approach corresponding to "single-window acceptance, centralized processing, and completion within a time limit". The regulation ensures the zone's tenant enterprises "competitive and convenient services such as one-stop service and agency service". To attract talent through a more flexible institutional arrangement and compensation system, Articles 25 and 26 of the Regulation provide for the development zone's human resources and compensation systems.

Box 5: Brief introduction of the Development Zone Regulations of Shanxi Province

b Domestic legislation related to industrial parks

All economic and social activities within the industrial parks are subject to the relevant laws and regulations of the country. China has a complete legal system in place in areas closely related to the operation and development of industrial parks (such as industrial development, land turnover, foreign investment, finance and taxation, environmental protection, and foreign trade).

c Bilateral and multilateral legislation

This kind of legislation is related to foreign-invested enterprises. Various trade and investment agreements ratified by China protect foreign-invested enterprises in the park and they are offered preferential treatment. China has signed 104 bilateral investment protection agreements and 16 free trade agreements. The foreign-invested enterprises and domestic enterprises in China's industrial parks are equally entitled to such preferential treatments and legal protection, and their investment and operation activities are subject to these bilateral legal agreements.

4.2.2 Park-specific regulations

Administrators of many industrial parks have also formulated regulations and measures applicable only to their parks to strengthen park regulation. For instance, the Administrative Committee of Suzhou Industrial Park promulgated measures[13] to protect the water source in the zone, and create a harmonious environment. Similarly, the Administrative Committee of the Beijing Economic and Technological Development Zone enacted measures[14] to help improve the occupational abilities of employees of businesses in the industrial park.

[13] Note: "Management Measures for the Drinking Water Source Protection Zone in Yangchenghu Lake of Suzhou Industrial Park"

[14] Note: "The Measures of Beijing Economic and Technological Development Zone for Subsidies to Elevate Occupational Abilities"

SECTION 5

INDUSTRIAL PARK MARKETING AND INVESTMENT PROMOTION

5.1 ACCESS REQUIREMENTS FOR ENTERPRISES

Enterprises and businesses operating in industrial parks should meet compliance standards related to industrial policies and rules; environmental protection, economic benefit; rational land planning and principle of practicality.

5.1.1 Compliance with the industrial policies and rules

- Approved projects of enterprises in industrial parks shall comply with national industrial policies. Foreign investment shall comply with the Special Administrative Measures (Negative List) for the Access of Foreign Investment (2018).
- Priority will be given to enterprises that conform to the orientation and strategic plan of the parks.
- Preferential access to the industrial parks will be given to projects in emerging industries and key industrial clusters, as well as priority projects set in national, provincial or municipal plans.
- Projects that involve hazardous chemical production and storage, discharge of pollutants that exceeds regulatory limits, high-water-consuming projects, projects with water pollution risk and projects with excessive use of land resources have restricted access to or are prohibited in industrial parks.

5.1.2 Compliance with the environmental protection principle

To ensure that no polluting projects enter the industrial parks, projects shall comply with national regulations on environmental protection and the environmental protection requirements of governments at various levels. The principles include but are not limited to:

- **Environmental quality standards**
  - Projects shall meet the second-class standards of the Ambient Air Quality Standards (GB3095-2012).
  - Projects shall meet relevant water-related standards based on the environmental functions of surface water in the industrial parks and their protection goals.
  - Projects shall meet acoustic environment quality standards. The acoustic environment shall be divided up into functional zones based on Technical Specifications to Determinate Suitable Areas for Environmental Noise of Urban Area (GB/T15190-94) and Environmental Quality Standard for Noise (GB3096-2008). Corresponding standards stipulated in the Environmental Quality Standard for Noise (GB3096-2008) shall be applied in the acoustic functional zones accordingly.
- **Pollutant discharge standards**
  - Projects of different categories in industrial parks shall respectively comply with the Emission Standard for Industrial Enterprises Noise at Boundary (GB12348-2008) for functional zones of sound environment beyond the boundary of industrial enterprises, and the Emission Standard for Community Noise and the Emission Standard of Environment Noise for Boundary of Construction Site (GB12523-2011) for functional zones of sound environment beyond park boundary.
  - Projects in industrial parks shall comply with water pollutant discharge standards concerning their industries. Enterprises in industries regulated by specific water pollutant discharge standards shall comply with the standards, while other industries shall comply with the stricter standards, either local water pollutant discharge standards or national water pollutant discharge standards.
  - Projects in industrial parks shall comply with the air pollutant emission standards subject to their respective industries. When there are sector-specific air pollutant emission standards, the industrial projects shall comply with the sectorial standards. Other projects shall comply with the local air pollutant emission standards or the national air pollutant emission standards, whichever are stricter.

Industrial parks should strive to be eco-friendly by stepping up efforts to develop the circular economy and imposing tough restrictions on water, electricity and other energy consumption areas. To build eco-friendly industrial parks, environmentally friendly projects shall be encouraged and low-carbon and energy-saving projects shall be given preferential treatment.

5.1.3 Compliance with the economic benefit principle

- Projects in the parks shall be high-tech, apply mature technologies, and have high value added and a good market prospect.
- Foreign enterprises, top 500 domestic enterprises, and leading enterprises in their industries are encouraged to establish a presence in the industrial parks. The investors should have a strong investment capacity and a good track record in credit.

- Projects shall meet the requirements of generating certain economic benefits, as normally reflected in the indicators of investment value, initial registered capital and investment intensity. These requirements include: the thresholds for fixed asset investment in the case of industrial projects, total invested capital in the case of general processing enterprises and invested capital for tertiary industry projects, the threshold for the ratio of initial registered capital to total investment, the limits for investment intensity (10,000 Yuan/mu) and land productivity (operating income/square meter).
- Projects shall meet requirements for the expected output value, i.e. annual input-output ratio after the projects are put into operation[15].

5.1.4 Compliance with the principle of sound land planning

- Projects shall meet plot ratio requirements.
- Projects shall meet building density requirements.
- Projects shall meet requirements pertaining to the ratio of floor space of administrative facilities and living amenities.
- Facilities not intended for production are strictly prohibited from being constructed in areas designated for industrial projects (these include residential buildings, buildings for experts, hotels, hostels and training centres).

5.1.5 Compliance with the principle of practicality

- **Case-by-case principle –** Projects in emerging industries and modern services, and projects that will involve huge investments, drive regional development and boast a high scientific and technological value will be approved and reviewed on a case-by-case basis.
- **Stage-by-stage principle –** Thresholds for access to industrial parks will be adjusted based on the needs of the parks as per the different stages of their development.

Established in June 1992, Langfang Economic Development Zone was approved by the State Council, to become a national economic and technical development zone. This zone has a total area of 69.4 km^2, accommodating nearly 160,000 people. The Zone has constantly been modifying its access threshold throughout its 20-plus years of development.

In October 1992, the Zone set requirements related to environmental protection and energy conservation for enterprises. According to the requirements, projects involving high energy consumption, high water consumption and serious pollution are not permitted to enter the Zone. In 2001, one company with an annual tax revenue of RMB 100 million wanted to build a project there. At that time, there were few companies in the Zone with an annual tax revenue of RMB 100 million. But as the project would consume nearly 10,000 tons of groundwater a day, the Zone finally did not give permission to that company. By the end of 2005, none of the more than 1,200 companies in the Zone were energy

intensive or polluting.

At the beginning of 2003, the development zone once again raised the threshold for entry into the zone, and imposed a strict restriction on project investment and density. According to the new requirements, land would no longer be allocated to domestic investment projects of less than RMB 50 million or foreign-funded projects of less than USD 10 million. Land price for foreign-funded projects should be no less than USD 300,000 per mu and no less than RMB1.5 million/mu for domestic projects. This standard was 10 times higher than the relevant indicators of provincial development zones in the "Tier-1 region" formulated by the relevant departments of Hebei Province after 2005. Furthermore, the threshold of investment density was 25% higher than provincial standards.

In 2006, the Zone raised the entry threshold for the third time. Land would no longer be allocated to domestic projects of less than RMB 100 million or foreign-funded projects of less than USD 10 million. In that year, among the 57 approved projects, 21 ones had an investment value of over RMB 200 million. The project investment intensity and density both complied with the entry requirements and none of the projects were polluting.

The three rounds of the entry threshold raising helped the project construction in the Zone achieve three transformations: from investment promotion to investment selection, from focusing on scale to focusing on quality, and from sound land development to intensive and efficient utilization. Between 2006 and 2017, the quality and efficiency of economic development of the Zone improved significantly, and the park moved from a "Park of speed" to a "Park of efficiency". In 2017, the actual investment density per square kilometre reached RMB 2.4 billion, GDP per square kilometre reached RMB 1.4 billion, and GDP per capita reached RMB 560,000. Energy consumption of industrial enterprises above the designated size was 160,000 tons of standard coal equivalent. Energy consumption per RMB 10,000 GDP and energy consumption per unit of industrial added-value above designated size, was only one-fifth and one-tenth of the average level of Langfang City, respectively.

Box 6: The Langfang Economic Development Zone raising the entry threshold for three times[16]

5.2 INVESTMENT PROMOTION

5.2.1 Investment promotion agencies

Industrial parks generally set up agencies in charge of investment promotion, usually named investment promotion bureaus or commerce bureaus. Their functions include:

- Implementing development strategies and policies relating to investment promotion, domestic and foreign trade and international economic cooperation at national, provincial and municipal levels, and formulating corresponding development plans, regulations, rules and measures for the industrial parks;
- Implementing and facilitating the enforcement of laws, regulations, guidelines and policies relating to opening up and investment promotion at national, provincial and municipal levels;

[15] Note: For example, it is stipulated that the input-output ratio of the first production year after the project is put into operation will be over 2:1 (according to the quota in the project proposal approved by the industrial park); the input-output ratio of the second production year will be above 1:1, etc.

[16] Langfang Daily: Langfang NDZ's economy. http://www.lf.gov.cn/Item/10586.aspx

- Taking charge of the opening up and investment promotion in the industrial parks, including investment consulting, project fact-finding, negotiation, assessment and evaluation, and the publicity of the investment environment;
- Offering guidance on foreign direct investment in the industrial parks;
- Communicating with supervisory authorities and taking charge of external economic cooperation; and
- Organizing, notifying and offering guidance on major trade fairs, forums, and exhibitions at home and abroad, on behalf of the industrial parks.

5.2.2 Investment promotion policies

The investment promotion policies for industrial parks in China generally include tax breaks, financing support, fee reduction and so on. For example, in the early stage of the development of industrial parks, enterprises that are recognized as high-tech enterprises in the national high-tech industrial development zones enjoy a 15%[17] cut of corporate income tax, and those start-up high-tech companies are exempted from income tax for two years. At present, domestic industrial parks mainly attract high-quality projects by improving business environment and public services, and upgrading soft and hard environment.

5.2.3 Investment promotion means

- **Investment promotion by the industrial parks –** An investment promotion centre operates on a commercial basis, focusing on project launch, coordination, implementation and services in the industrial parks. It is jointly established by developers of an industrial park, authorized agents and local governments.
- **Investment promotion through the Internet and media –** This includes an integration of administrative, commercial, corporate and media resources to develop online investment promotion platforms with multi-lingual texts, videos and animations. It also involves developing media-based investment promotion plans to build a positive image of projects by making full use of the influence of mainstream media at home and abroad.
- **Event-based investment promotion –** This involves participating in national and international investment promotion events, including conferences, exhibitions in the industrial parks, business forums, business festivals, technical seminars and special industrial symposiums.
- **Overseas investment promotion –** This involves in participating in various overseas investment events, including investment conferences, economic and trade seminars, economic exchange and exhibition activities, field visits for key projects or specific sectors, and friendly visits. It also involves holding overseas investment briefings for industrial parks, investment project releases, etc.
- **Investment promotion through unleashing the potential of the whole industrial chain –** This mechanism involves using or leveraging the strength of anchor enterprises in the park, or their related businesses, to stimulate investment on a larger scale.
- **Investment promotion through commission –** This involves developing a professional investment promotion team, rolling out incentives for investment promotion, setting up investment promotion funds, and building an extensive investment promotion network by leveraging the resources of legal corporations, economic organizations or individuals at home and abroad. It also involves taking an active part in cross-regional and cross-border investment projects.

[17] Note: This policy has now been abolished

- **Door-knocking investment promotion –** This involves building a database of prospective enterprises, focusing on target customers through various channels, and convincing them with tailor-made business investment proposals and customized solutions.
- **Special features-based investment promotion –** This involves improving the investment environment by taking advantage of features unique to the local economic environment, and making investment promotion targeted, efficient and unique. Moreover, this will attract investments from particular industries and relevant enterprises.
- **Industry-based investment promotion, or investment promotion with a specific subject –** This involves cooperating with relevant industry associations and highlighting the industrial features to achieve targeted promotion outcomes.

SECTION 6

INDUSTRIAL PARK OPERATION AND MANAGEMENT

The operation goals of an industrial park consist of promoting economic development, social services, environmental protection and inter-park cooperation. As indicated in Figure 1, an industrial park is responsible for ensuring infrastructure and personnel talent support, encouraging scientific innovation, providing education and medical services, doing community development, doing waste treatment, and advancing the use of clean energy, etc.

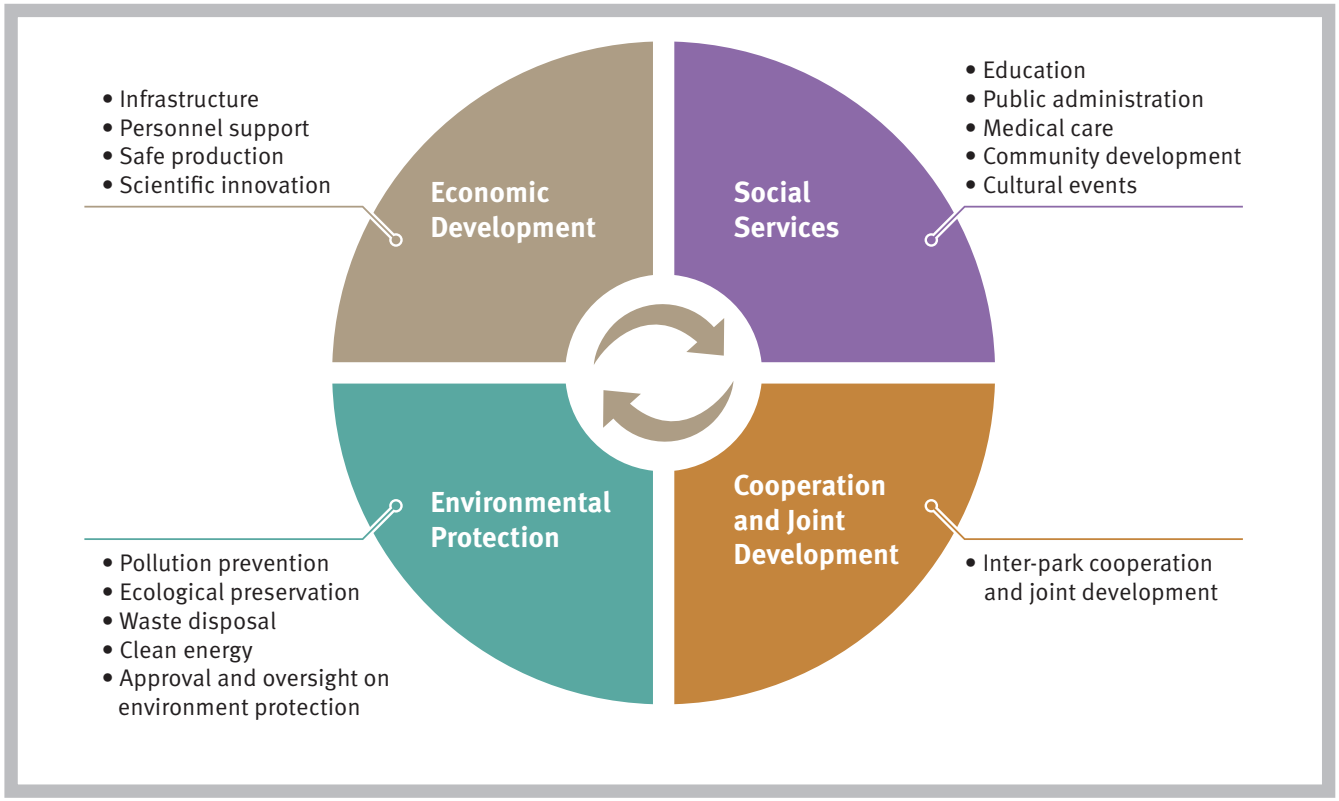


Figure 1: Operation goals and tasks of an industrial park

6.1 PROMOTING ECONOMIC DEVELOPMENT

6.1.1 Infrastructure management

The management of the infrastructure in a park includes: the provision and maintenance of public facilities; construction, acquisition and leasing of public rental buildings and followed operation and maintenance; management of the real-estate; and evaluation of the real estate intermediaries and property management companies.

China's industrial parks usually set up a department that oversees and manages the provision and maintenance of infrastructure. When the establishment of such a department is not feasible (or under corporate management model), property management companies, housing and land management bureau, or the local road management bureau will be responsible for the maintenance of an industrial park's infrastructure. A transparent fee estimation and payment mechanism is applied for charging infrastructure maintenance costs.

Infrastructure management is a vital part of the industrial park's operation. Unlike industrial estate developers, industrial parks do not provide one-time or short-term housing sales, rather they provide a full cycle service, including pre-sale, sale and after-sale services. The quality and availability of the public infrastructure within the park determines the industrial park's attractiveness to companies.

6.1.2 Personnel support

Park managers are also responsible for providing support to attract, develop and retain a highly skilled labour force. Some of the key personnel support initiatives in China include: attracting talents, organizing labour unions, providing professional training and promoting harmonious employee-employer relations.

- **Attracting talents –** China's industrial parks are the country's leader in attracting talents. They have taken the lead in recruiting professionals from across the country, and pioneering the large-scale introduction of overseas talents to start businesses and promote innovation. The country introduced the National Medium and Long-Term Planning for Science and Technology Talent Development (2010-2020) in 2010. The plan prioritized the attraction of talents in the development of an industrial park and proposed tailor-made incentives such as house purchase subsidies, preferential housing funds, preferential house rentals, income subsidies, preferential schooling for employees' children, medical care, and other subsidies and awards. Some parks have also built "special carriers for talents", by building new scientific research centres and innovation laboratories, or enhancing existing ones.

Suzhou Industrial Park (SIP) is a national economic and technological development zone and a county-level administrative district under the jurisdiction of Suzhou city. It is an important international cooperation project between China and Singapore, and has created a new form of mutually beneficial cooperation between the two countries. SIP is also the growth pole of Suzhou's economy serving as the commercial and financial centre of Suzhou city and the future city centre.

Since August 2015, SIP has piloted a three-year "Double Hundred Talents" program to strengthen the international talent base of the park. The program includes five aspects: supporting innovation and start-up by leading talents in science and technology, creating growth space for high-level leading talents, encouraging leading talents in

scientific and technological education, giving full play to leading talents in high-end service industry, and building high-skilled leading talent teams. The program is expected to attract more high-end talents through subsidies and other incentives.

Box 7: The Suzhou Industrial Park's Talents Program[18]

- **Establishing labour unions –** The Labour Union Law of China requires industrial parks to establish and encourage labour unions to protect the interests and rights of the park's employees. The major responsibilities of the industrial parks trade unions include: protecting the interests and rights of the employees, building harmonious employee-employer relations, assisting workers' safety monitoring and inspection, production protection, sanitation and health care, addressing the work-related challenges facing employees, protectinging the interests and rights of female employees and conducting communication between the labour unions.

- **Providing professional training –** Skilled and quality human resources are very important for the operation of industrial parks. Improving the professional skills and promoting quality employment are some of the most important tasks performed by industrial parks' operation and management agencies. In 2006, the General Office of the State Council of China issued the *Measures on Further Enhancing the Work on Supporting the Development of Highly Skilled Talents*, which guides the industrial parks to make preferential policies and incentives for skill training corresponding to their skill requirements. This included offering subsidies to participants in the training projects, offering encouragement and support for companies engaging in foreign specialized technical talent training, and encouraging people to pursue higher education.

- **Building harmonious employee-employer relations –** The effective operation of industrial parks require harmonious employee-employer relations. One of the key tasks of park management bodies in China is to proactively assist companies' to develop a harmonious employee-employer relationship. There are also government initiatives to identify typical industrial parks as a "comprehensive experimental zone for harmonious employee-employer relations." The aim is to establish sound labor mechanisms, preventative measures for labour disputes, honesty evaluation systems for labour security, coordination mechanisms for labour relations, supervision and law enforcement systems for labour security, arbitration and mediation mechanisms for labour disputes, and emergency response mechanisms for labour relations.

  To improve employee-employer relationship mechanisms, some industrial parks have put in place an evaluation system for corporate social responsibility, of which protecting the legitimate interest and the rights of workers is the key. Setting up supervision teams and command centres for labour security are typical approaches to building a coordinating mechanism for labour relationships, or a supervision and law enforcement system for labour security. In addition, cutting-edge technologies, such as big-data, are gradually being applied to maintain labour relationship security. Some parks carry out "Internet + labour relationship" projects to build big data service platforms.

6.1.3 Workplace safety

Workplace safety is a mandatory requirement for the smooth operation of an industrial park and is a top priority of park management bodies. An industrial park's management body usually has a mechanism that oversees workplace safety. Under the corporate management model, the management and supervision over workplace safety is usually the responsibility of the workplace safety body of the local authority, and a dedicated department for workplace safety is established within the company or institution. According to the Workplace Safety Law of China, and the relevant workplace safety related practices, a holistic emergency management system applicable to the park should be established to monitor the operation across the board and take charge of emergency response training.

[18] Suzhou Industrial Park: "Jinji Lake Double Hundred Talents"Program. http://www.sipac.gov.cn/

- **Develop an emergency management system –** Industrial park management bodies should develop an emergency management system applicable to the whole park to respond to all kinds of safety emergencies. A typical industrial park in China is equipped with a complete emergency management system from the initial phase of planning. For example, there is an integral and comprehensive disaster prevention program based on the specific circumstances of the park. This programme includes a flood prevention plan, an earthquake prevention, mitigation and relief plan, a fire prevention and control plan and a civil air defence engineering plan. Specially, a park needs to set up a disaster prevention and mitigation center, ensure public safety, and establish a command centre for disaster prevention and mitigation. The programme outlines how public health and safety are protected, sets up an early-warning system for meteorological disasters, establishes public safety institutions to guard against potential security threats, improves the social security system to prevent mass incidents and provides an emergency plan against terrorist attacks.

- **Oversee production safety –** China's industrial parks set up special agencies to oversee production safety. The main responsibilities of such agencies include:

  › Drafting rules and regulations on production safety in line with the needs of the industrial parks;

  › Instructing, coordinating and monitoring the work of production safety oversight of various departments in the industrial parks;

  › Preparing statistics about accidents of various types in the industrial parks;

  › Analyzing and forecasting overall production safety situation in the host city on a regular basis;

  › Disseminating information on production safety;

  › Supervising, checking, instructing and coordinating the work of production safety of various departments in the industrial parks, and evaluating their performance in meeting annual responsibility targets.

- **Provide emergency response training –** China's industrial park managers take charge of organizing awareness-raising campaigns and training on production safety. This duty includes training and evaluating the qualification of enterprises' production safety officers and managers, as well as providing training to staff for special operations (except staff responsible for special equipment operation) or public institutions in accordance with the law and evaluating their performance. It also includes supervising and reviewing safety training and education for the enterprises' employees, and managing work related to certified safety engineers' qualifications.

6.1.4 Scientific and technological innovation

The work related to scientific and technological innovation in the industrial parks mainly refers to the management of scientific and technological projects, scientific and technological cooperation, and the protection of intellectual property rights and scientific and technological exchanges and cooperation. The industrial parks should set up designated agencies to perform the functions mentioned above.

- **Management of scientific and technological projects –** This function under industrial park operation involves:

  › Review and approval of scientific and technological projects;

  › Verification and conferral of scientific and technological rewards;

  › Approval of corporate tech centres;

  - Collection of information on talents urgently needed in the industrial parks;
  - Providing guidance on preparing materials for applying for the projects mentioned above.

- **Intellectual property rights protection –** As technology users and pioneers in production, industrial parks have vigorous innovation capacity, just as the scientific research institutes. Therefore, the management entities of the parks are obliged to provide necessary services to help protect the intellectual property rights of innovations to ensure and encourage innovation. China's industrial parks protect intellectual property rights by: providing rewards for creating intellectual property, providing incentives to promote the application of intellectual property, and providing support for companies and institutions based in the park to defend their intellectual property rights, including through financial support.
- **Promote scientific and technological exchanges and cooperation –** Industrial parks in China often organize science and technology exchanges and events to broaden the horizon of enterprises in the parks and draw experiences from high-level international undertakings for innovation.

6.1.5 Enterprise incubator

In terms of incubating businesses, the main functions of industrial parks' management bodies include:

- Encouraging and guiding enterprises to step up R&D investment;
- Improving enterprises' capacity for scientific and technological innovation;
- Encouraging and guiding enterprises to commercialize innovation outcomes and enhance the competitiveness of pillar industries in the industrial parks;
- Building market platforms for enterprises;
- Developing and optimizing a financial system for scientific and technological innovation in SMEs;
- Improving protection systems for intellectual property rights;
- Assisting enterprises to establish corporate incubation centres and develop Maker Space with unique features of the industrial parks;
- Supporting business start-ups and innovation; and
- Ramping up efforts to improve and standardize services and management of incubators.

The Technology & Startups Incubation Center of Wenzhou Economic and Technological Development Zone was established in April 2014 and is the starting area of the Ocean Science and Technology Innovation Park. At present, the Center rents the Chuangli Electronics factory covering an area of 25 mu, with a total construction area of 27,000 m^2. It is composed of a comprehensive office building, a research and development area, a workshop and a living service area. The center has 18 enterprises, 2 intermediaries and 1 youth e-commerce entrepreneurship platform. It is a multi-functional, composite, open and public resource-sharing technology business incubator, which integrates technology, development, information,

management, training and other related supporting functions. It is a public welfare, non-profit scientific and technological service organization jointly managed by the local Science and Technology Bureau and Binhai New City Investment Group.

The center aims to provide facilities, various preferential policies and logistical services for the technology-based enterprises in their early stages, reducing investment risks, and improving the success rate of business start-up. The center will invite colleges and universities to set up industrial R&D institutions and carry out technical cooperation, technical training and technical exchanges to provide technical support for incubators. The centre will also invite venture capital, patent, financial, legal, talent information, technology consulting and other related agencies to provide comprehensive services for enterprises.

Box 8: The Technology & Startups Incubation Center of the Wenzhou Economic and Technology Development Zone[19]

6.2 PROVIDING PUBLIC SERVICES

In China, industrial parks are also residential and commercial locations because employees often live there or nearby. Therefore, industrial parks should support and facilitate people's life by providing public services such as administrative services, education, medical services, community development and cultural activities.

6.2.1 Administrative services

China's industrial parks strive to provide comprehensive, high-quality and efficient administrative services to tenant companies. Administrative services provided to the companies in the parks include administrative approvals, law enforcement, and market regulation and management.

- **Administrative approval –** Administrative approval relates to various aspects of business operation as well as life and work in the parks. Major administrative approval services include:
  - Service related to business operation such as business registration, chattel mortgage and equity pledge;
  - Registration of foreign-invested projects, fixed asset investment, import and export, and pricing work;
  - Technical administration such as project planning, survey and design, wastewater discharge, prospecting and landscaping;
  - Social affairs such as labour dispatch, social group activities and publication license;
  - Entry and exit;
  - Residency-related administration;
  - Tax registration; and
  - Firefighting work.

[19] Wenzhou Economic and Technological Development Zone Managing Committee: Overview of the Technology & Startups Incubation Center of Wenzhou Economic and Technological Development Zone. http://www.wetdz.gov.cn/art/2017/7/3/art_1302416_7337472.html

In order to provide comprehensive and efficient services to companies and residents, industrial parks in China often establish one-stop service centers, as illustrated in the box below.

One of the achievements of the Suzhou Industrial Park (SIP) in fully drawing on Singapore's advanced management expertise and fully considering China's administrative features is the "one-stop service". It is an important part of the park's "pro-business service" principle.[19]

In 1995, this park took the lead in launching window-based consulting services in China and set up three windows for development, construction, recruitment, planning and human resources, and providing consulting services regarding the establishment of companies. The One-stop Service Center of Suzhou Industrial Park was officially established in September 2002. In July 2005, it became the first administrative service center in China with an ISO9001 quality management system certification. On behalf of the management committee, it offers all the administrative licensing and registration services for the approval, establishment, production and operation of all companies in the park. The center also offers services related to certain personnel matters in economic and social management, and relevant organization, coordination, management, supervision and guidance for relevant windows in the center. It has been the only administrative service center in the country that receives and handles application at the front desk, with administrative licensing functions.

In August 2015, the park started a pilot reform program of relatively concentrated administrative licensing process, fully leveraging the advantages of the review and approval services by a one-stop way. As a public institution under the Bureau of Administrative License, the one-stop service center continues to offer "transparent, quality, efficient and convenient" all-around online and offline integrated administrative services for the companies and people in the park and improve the pro-business practices in the park.

Box 9: The One-stop Service Center of the Suzhou Industrial Park[20]

- **Market regulation –** The market regulation system for the industrial parks generally includes industrial and commercial administration, quality inspection, price monitoring and food and drug supervision and management. Chinese industrial parks have agencies dedicated to regulating the market and the main functions of these agencies include:
  - Ensuring the implementation of market related laws, regulations, principles and policies;
  - Regulating and maintaining the market order;
  - Consumer protection;
  - Regulating production quality in industrial parks;
  - Safety supervision, standardization and measurement of the special equipment;
  - Administrative supervision of pharmaceutical and medical companies;
  - Overseeing and regulating prices.

[20] Suzhou Industrial Park: The One-stop Service Center of Suzhou Industrial Park. http://www.sipac.gov.cn/dept/xzspj/zwgk/zxjs/201810/t20181008_824444.htm

- **Comprehensive law enforcement –** In order to build harmonious and liveable industrial parks, dedicated agencies should be established to perform functions such as urban management, landscape maintenance, sanitation management, and management of business operations. A typical industrial park in China would normally delegate such tasks to the urban management and law enforcement department who share a mandate to manage, maintain and repair urban environments, lighting and sanitation facilities. The department is also responsible for planning, building and managing the information system of urban administration, as well as establishing and improving a digital urban management system. Furthermore, the department supervises and evaluates sanitation, landscape and parking services, ensures law enforcement on urban management (urban landscape and administration, planning and construction, water administration, pipe networks, and urban environment), monitors workplace safety, fishery administration, land use, pipelines for urban gas, and related municipal services, and trains law enforcement personnel.

6.2.2 Educational services

Dedicated agencies are usually responsible for education administration in the parks. Their primary functions include:

- Implementing national education plans and principles, policies and regulations;
- Devising plans for education reform and development in the parks;
- Macro-managing, guiding, coordinating, supervising and inspecting the implementation of education reform plans;
- Managing and guiding all levels of formal education in the parks (early education, primary education, education for adults, and private education).

6.2.3 Medical services

Accessible and effective medical care services are pivotal to the normal operation of an industrial park. Given the differences in medical care systems across the world, the health care services in the parks could vary greatly in quality. China's industrial parks generally provide complete basic medical care services, such as building comprehensive hospitals and providing resources for community medical care, in line with China's existing medical insurance system.

6.2.4 Community development

Community development is a crucial factor in the sound operation of an industrial park. It includes setting up a community working committee as a primary-level administrative unit and mobilizing volunteers and community health service centers to improve the entire community service system.

China's industrial parks have also drawn upon international experience in developing their own communities with Chinese characteristics. For example, the Suzhou Industrial Park, jointly established by China and Singapore, introduced the concept of a neighbourhood center, a Singaporean community

service concept. A neighbourhood center is an integrated regional service center encompassing commerce, culture, sports, health and education led by the government. It is a proven successful model for building supporting community facilities, derived from advanced Singaporean public administration methods.

6.2.5 Cultural Activities

To enrich people's life, park authorities regularly organize diverse cultural activities to create a high-quality living environment for residents in the parks.

6.3 ENHANCING ENVIRONMENTAL PROTECTION

Industrial parks have made great contributions to socio-economic development. However, despite these achievements, some industrial parks are currently facing challenges related to environmental pollution due to a lack of awareness, to-be-improved environmental management systems and serious environmental risks and hazards. Today, environmental protection has become indispensable for the efficient operation of industrial parks in China, yet environmental standards vary across industrial parks. Some typical Chinese industrial parks highly value environmental protection in their operation and establish special agencies to oversee pollution prevention and treatment, ecological conservation and environmental assessment.

6.3.1 Pollution prevention, treatment and monitoring

Pollution control and prevention in a typical Chinese industrial park includes:

- Setting a cap on overall pollutant discharge and carrying out cap-and-trade scheme for pollution rights;
- Working hard to reduce pollutant discharge;
- Monitoring project construction and reviewing projects upon their completion, approving and managing discharge permits;
- Rolling out special programs for pollution prevention and control in key river basins and regions;
- Making special efforts to strengthen prevention and control of water, air, sound, soil and heavy metal pollution;
- Approving and managing the movement of hazardous waste and examining relevant operators' qualifications;
- Managing imported solid waste;
- Registering hazardous waste and managing POPs;
- Examining and overseeing compulsory clean production of key enterprises.

Some industrial parks utilize advanced environmental monitoring technologies to regularly monitor the environment, atmospheric, water, solid waste and noise, and produce monitoring reports and yearbooks.

Jiangsu province has implemented various national environmental laws and regulations, and selected a number of innovative and practical technologies for ecological and environmental treatment. Jiangsu China-US Environmental Monitoring Co., Ltd. has established a three-dimensional infrared monitoring station and built a multi-scan reflective light path on different façades to build a three-dimensional monitoring system. They have also set up meteorological stations at different heights for collecting real-time meteorological data, and built a meteorological data collection system. The technology will be applied to monitor the industrial park environment, workplace safety, mobile emergencies, industrial ports, oil fields and other fields. The development and application of similar technologies will also be introduced for park planning and construction.

Box 10: Application of air quality monitoring technology in Jiangsu Province

6.3.2 Ecological preservation

Ecological preservation in the industrial parks mainly refers to bio-diversity protection; the preservation of forests, rivers and lakes, grassland or wetlands; ecological restoration; the prohibition of constructing hardened embankments and riverbeds along the water courses in industrial parks; the preservation of river shorelines; and water cycle and soil improvement.

6.3.3 Environmental regulation

The industrial parks shall be strict in issuing environmental approvals and all types of environment-related licenses and permits. The parks shall entrust the designated environmental authorities to approve projects on environment-related issues; conduct registration for the qualification of environmental impact assessment institutions and performance evaluation; evaluate the environmental impact of projects during operation, and review and issue emission permits. The competent authorities shall also conduct compliance oversight.

6.3.4 Waste management

The industrial parks shall set an approval procedure for waste management, rules on levying pollutant discharge fees, criteria for levying municipal domestic garbage disposal fees, a registration procedure for resource recycling businesses, issue permits for the discharging of urban sewage into drainage pipelines and define the criteria for levying urban construction waste disposal fees.

China’s industrial parks shall abide by relevant laws and regulations[21] in what regards waste management. There are set procedures and criteria in line with regional and local regulations.

[21] Note: Administrative Measures for Municipal Solid Waste (Order No. 157 of the Ministry of Construction), Environmental Protection Law of the People's Republic of China, Law of the People’s Republic of China on the Prevention and Control of Water Pollution, Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste, Law of the People's Republic of China on Prevention and Control of Pollution from Environmental Noise, Administrative Measures for Renewable Resource Recycling (Order No.8 of Ministry of Commerce, National Development and Reform Commission, Ministry of Public Security, Ministry of Construction, State Administration for Industry & Commerce, State Environmental Protection Administration), Regulations on Urban Drainage and Sewage Treatment (Order No. 641 of the State Council), Administrative Measures for Permits for Discharge of Urban Sewage into Drainage Pipeline Network (Order No.21 of Ministry of Housing and Urban-Rural Development).

Established in December 1984, the Tianjin Economic and Technological Development Zone, is located 40 km east of Tianjin city. It is an important part of Tianjin Binhai New Zone, part of the national comprehensive reform pilot zone, and among the first group of China's national economic and technological development zones. In 2017, the Tianjin Development Zone innovatively introduced the "Environmental Protection Stewardship" model to provide companies with systematic "environmental diagnosis" services by employing third-party service providers. This has helped companies reduce environmental risks and costs. Moreover, violations of environmental laws have been reduced and the effectiveness of regional pollution control has been improved.

In April 2016, the Ministry of Environmental Protection introduced the concept of "environmental protection stewardship", promoting of the development of environmental consulting services, and encouraging qualified industrial parks to hire third-party professional environmental service providers as "environmental protection stewards" to provide integrated environmental services and solutions for overseeing the construction of environmental and pollution control facilities.

Also in 2016, Tianjin Development Zone started a special campaign for treating volatile organic compounds emitted by 27 enterprises, and adopted a series of environmental protection measures (such as online real-time monitoring of flue gas emissions from coal-fired boiler enterprises). Financial subsidies worth RMB 100 million were given to support more than 60 enterprises in environmental treatment and upgrading.

Box 11: Environmental protection stewardship model in the Tianjin Development Zone[22]

6.3.5 Clean energy use

When supplying energy, the industrial parks should strive to effectively recycle energy and adopt clean, low-carbon energy sources. The parks should design a complete system of water supply, drainage and reclaimed water, a rainwater collection system, and a power grid system. They should establish a safe, efficient and clean gas supply system and work out a plan on thermal cycling and heat supply facilities based on their actual needs.

In Suzhou Industrial Park, the wet sludge (with a water content of 80%) produced by the park's Second Wastewater Treatment Plant is treated in the Sludge Drying Plant. In order to utilize the waste heat of the thermal power plant, the second-stage drying equipment of the sludge drying plant utilizes the indirect heat exchange of the waste heat steam from the thermal power plant to dry the sludge, reducing the 80% moisture content to 10%-20%. Since the sludge contains organic matter, the heat value of the sludge after drying is about 2,600-2,800 kcal, which means the sludge can be recycled as low-heat fuel at a low cost. Therefore, the sludge-drying plant sends it to the thermal power plant's dry coal shed on a conveyor belt. The plant mixes it with high-quality coal at a ratio of about 1:3 and burns it, fully recycling and utilizing the heat value of the dried sludge. In addition to power generation from the heat produced by dry sludge and the high-quality coal, the waste heat steam is used again for sludge drying as well as heating and cooling in the park. The 90-100 steam condensate produced after sludge drying is all returned to the thermal power plant for recycling and to recover thermal energy.

With the wastewater treatment plant, the sludge drying plant and the combined heat and power facility, the park has built a new energy supply model for cooling, heating and power supply. This replaces the traditional energy supply model and achieves an intensive use of energy at different levels. This model of industrial symbiosis can save 13,700 tons of standard coal each year, and the ash residue after sludge incineration is used to produce building materials.

Box 12: The Suzhou Industrial Park constructing recycle and symbiosis system of clean energy[23]

6.4 ADVANCING COOPERATION AND JOINT DEVELOPMENT AMONG INDUSTRIAL PARKS

The joint development of industrial parks has become an important tool for collaborative economic development and relocation of industries, and is an effective means for crossing the boundaries of administrative jurisdictions, promoting resource sharing and optimizing resource allocation. In 2017, the No. 7 document of the State Council specified that "the eastern region should be encouraged to work with the central, western and the northeastern regions to co-build development zones". Similarly, the *Guidance on Implementing Regional Development Strategy to Promote Regional Coordinated Development* issued by the NDRC in 2016 also put forward that "the central, western and the northeastern regions" are encouraged to work with the "eastern region" to co-build industrial parks through different ways, such as commissioned management, investment cooperation, etc.

The joint development of industrial parks is conducive to creating clusters of competitive industries and extending industrial chains, and can support balanced economic development among regions. The positive effects of joint development of industrial parks are shown in the following five aspects:

- Technology sharing and transfer via exchanges on projects and mutual learning;
- Resource sharing by complementing each other's resources and improving their allocation;
- Market sharing by enabling companies in less developed parks to rapidly access the local markets of advanced parks to increase market share;
- Human resources sharing by exchanging of experts and organizing training that is held by developed parks for the less developed ones; and
- Tax revenue sharing by splitting interest and profits upon previously agreed terms.

Building on these five dimensions of sharing, industrial parks can achieve leap-frogging development by mobilizing all premium resources. In terms of cooperation models, the enclave model has become a major means. The *Guidelines on Supporting the Development of Enclave Economy* issued in 2017 called for an innovative cooperation mechanism for the "enclave economy" to leverage the comparative advantages of different regions, optimize resources allocation, utilize resources more efficiently, and elevate the role of the market.

Backed by the central government and various local governments, more and more enterprises are paying attention to and participating in the joint development of industrial parks. As of 2019, more than 200 parks in Shanghai municipality, Jiangsu province, Zhejiang province and Anhui province have participated in joint development in the Pan-Yangtze River Delta region alone. The Shanghai Waigaoqiao Bounded Area and the Qidong Binhai Industrial Park in Jiangsu have co-built the Shanghai Waigaoqiao Group (Qidong) Industrial Park. The Tongling Economic Development Zone and China Hi-Tech Group Corporation have jointly developed the China Garment (Tongling) Industrial Zone. The Baosteel Group and Nantong city together established the Baosteel Industrial Park.

[22] Xinhua net: Environmental protection stewardship model in Tianjin Development Zone. http://www.xinhuanet.com/fortune/2017-06/05/c_1121089448.htm

[23] Suzhou Industrial Park: Constructs recycle and symbiosis system of clean energy. http://www.sipac.gov.cn/

Zunyi Economic Development Zone cooperates with Shanghai Caohejing Emerging Technology Development Zone to jointly build the "Zunyi Tech Innovation Center in Shanghai Caohejing Development Zone" project, based on the resource advantages of Shanghai and Zunyi, aiming to build an industrial cooperation demonstration zone between the east and the west. The park focuses on cultivating three leading industries of smart manufacturing, biomedicine and high technology. At present, the park has invested a total of 300 million yuan to build the first phase of the project, with a total area of 110,000 square meters, 17 enterprises, and 500 million yuan in place.

Box 13: An east-west inter-provincial cooperation park[24]

[24] China National Economic and Technological Development Zones & Border Economy Cooperate Districts: Zunyi: East-West inter-provincial cooperation park. http://ezone.mofcom.gov.cn/article/zt_cxfz/column02/201902/20190202832578.shtml

SECTION 7

INDUSTRIAL PARK PERFORMANCE EVALUATION

7.1 SIGNIFICANCE OF PERFORMANCE EVALUATION

The indicator system for industrial park evaluation aims to present an objective and comprehensive picture of industrial parks. The system includes an overall index and itemized indices that are based on the weights of each index, the calculation methods and index benchmarks designed for the system. The indices indicate the strengths, features and weak points of industrial parks and are a reliable reference for the formulation of development strategies and policy adjustments at the national level.

7.2 FRAMEWORK OF PERFORMANCE EVALUATION SYSTEM

a Principles of designing the performance evaluation system

- **Taking a holistic approach –** The evaluation system examines the overall development of industrial parks, including industrial development, resource utilization, innovation capacity and investment environment. The evaluation indices are thus designed to present the industrial parks' status quo, potentials, strengths and weak points.
- **Playing a guiding role –** The evaluation system should fully reflect industrial development prospects, ways forward for development zones and priorities in national policies. It should steer development zones toward sustainable development through industrial structure optimization, industrial upgrading and the transformation of development models in accordance with industrial development plans.
- **Integrating synchronic and diachronic factors –** As industrial parks evolve, the evaluation indicator system should be designed to reflect the achieved outcomes and the course of development. To generate comprehensive evaluation results, it should include both the synchronic indicators reflecting the status quo and the diachronic indicators showing the progress in various fields.

- **Being comparable –** The evaluation indicator system should draw on experiences and research outcomes at home and abroad. The indicators shall enable comparisons across China and with foreign counterparts after proper adjustments, and support synchronic comparisons among different periods. Therefore in the indicator selection stage, it is imperative to take the indicators' consistency into consideration and their feasibility for analyses and forecasts.

b Categories of performance evaluation indicators

- **Economic Development –** Economic development indicators are to evaluate the overall state of economic development in industrial parks, including;
  - › Economic output values (such as regional GDP, industrial added value, gross profits of enterprises and gross tax revenue);
  - › Amount of foreign capital used (cumulative amount of the attracted foreign investment and actually used foreign investment in the year);
  - › Total volume of foreign trade (total import and export volume);
  - › Speed of development (growth rate of industrial added value, growth rate of total output);
  - › Growth rates of operating income of the secondary and tertiary industries;
  - › Growth rates of the gross profits of enterprises;
  - › Gross tax revenue, and annual growth rate of fixed asset investment; and
  - › Quality of development (including profit margins in industrial parks, per capita labour productivity, number of staff working in enterprises, concentration of pillar industries in industrial parks and average wage of employees).
- **Contribution to regional development –** In China, industrial parks are key drivers of regional economic development and social progress. The contribution of industrial parks to regional development is the result of their economic contribution, which can be evaluated by examining the ratio of park GDP to local GDP, the ratio of park budgetary revenue to local budgetary revenue, and the ratio of park tax revenue to local tax revenue. Industrial parks also contribute to regional development by contributing to regional cooperation. This can be evaluated by looking at the number of parks developed jointly with other industrial parks, or the number of parks developed in cooperation with other regions.

  Last bu not the least, industrial parks contribute to regional development by contributing to industrial development. This can be evaluated by looking at the share of industrial park's high-tech manufacturing output in the total high-tech manufacturing output of the host region, the added value of an industrial park's tertiary industry as a share in the total added value of the host region, the number of industrial development funds and venture capital funds, and the growth rate of the number of enterprises.
- **Resource utilization and ecological environment –** The sustainable use of resources and a good ecological environment underpin the sustainable development of industrial parks. This indicator evaluates resource utilization and environmental protection in industrial parks, as evidenced by dimensions such as resource efficiency (including regional project density, land productivity, land output intensity, energy consumption per unit of GDP, and resource recycling rate), and ecological and environmental indicators (including whether a park is a national-level ecological demonstration park or not, COD/sulphur dioxide/NOx/ammonia nitrogen emissions per unit of regional GDP, and the number of enterprises obtaining ISO14000 certification).

The Tianjin Economic and Technological Development Zone is a national eco-industrial demonstration park, a national circular economy demonstration park and a national pilot park for recycling reform. This industrial park combines ecological construction with industrial planning to create a green and sustainable development model for industrial parks.

- **Improving the ecological and environmental protection system & implementing the green development strategy –** The Tianjin Zone integrates the concepts of eco-industry, circular economy, low-carbon economy and ecological civilization into the overall planning and various special plans. It sets up a green development fund, conducts credibility evaluations on companies' environment protection, and creates a good atmosphere of ecological conservation, which reaches every corner and involves everyone in the zone.

- **Accelerating the adjustment and upgrading of industries & highlighting the main task of green development –** The Tianjin Zone is the first project in the country to comprehensively utilize chemical tail gas for heating and power generation, and introduces a third-party pollution treatment model to achieve a virtuous cycle of sewage treatment and zero discharge of industrial wastewater. At the same time, the development zone has established four circular-economy industrial chains, such as electronic communications, machinery manufacturing, pharmaceuticals and chemicals, and food and beverages. This zone also maximizes the effective circulation and the efficient use of resources and energy by infrastructure construction, such as a seawater desalination system, waste incineration-based power plants and a regional water circulation system.

- **Building a good platform for ecological progress and expanding advantages of green development –** The green area of the Tianjin Zone exceeds 20 million m^2, almost 30% of the total area of the zone, and the landscape area is over 1.503 million m^2. The development zone has built a gridding management system for air pollution control that realizes real-time monitoring of pollutant emissions from industrial enterprises, thus the air quality can reach the national air standard II for more than 210 days a year.

Box 14: A typical zone of ecological development[25]

- **Investment environment –** A favourable investment environment meets businesses' interests and enables investment promotion. This indicator evaluates both the hardware and software aspects of an industrial park. The hardware aspect evaluates the infrastructure of an industrial park (including transportation accessibility, quality and coverage of telecommunications facilities, information technology facilities and networks, quality and coverage of sewage and waste disposal facilities, warehousing and logistics capacities, and feasibility of overall plans for future development).

  The software indicator evaluates the provision of public services in an industrial park. Public services include public facilities such as quality and quantity of healthcare, sanitary and fitness facilities, quality and quantity of schools, education institutions and research institutes, access to banking, commercial and tourism services, and the level of alignment of local urban development with the international standards.

  Another category of public services includes ISO certification and the legal system. It is crucial to evaluate whether authorities of industrial parks have obtained ISO14000 and ISO9001 certification. Issues related to social order and public security, and the civility and education levels of residents are also important. The legal environment includes the level of consistency between administrative orders and national laws, the availability of the local preferential policies and the development level of the legal environment, the law enforcement effectiveness of governments and enforcement agencies, and the online approval ratio by one-stop administrative service centers.

- **Scientific and technological innovation –** Scientific and technological innovation is the engine of sustainable development. This indicator evaluates the development of platforms for scientific and technological innovation and the park's capacity for driving innovation. The indicators are related to the evaluation of platforms, resources, capacity and talent supply for scientific and technological innovation, they include:

  - Actual fiscal expenditure used for scientific and technological innovation;
  - Industrial enterprises' R&D expenditure as a share in revenues of their main business;
  - The numbers of vocational schools, incubators, makerspaces, research institutes at or above provincial level;
  - The number of enterprises with well-known brands at or above provincial level;

- The number of high-tech enterprises;
- The share of revenues from main business of high and new-tech companies in total revenues from main business of large companies in parks;
- The proportion of employees holding a master's degrees or above;
- The proportion of technical personnel with senior professional titles;
- The proportion of highly skilled personnel;
- Numbers of patents per 10,000 people;
- Annual PCT applications;
- Annual patents granted; and
- The value of technology contracts.

In October 2015, the State Council approved the plan of the Suzhou Industrial Park (SIP) to take the lead in launching a comprehensive experiment of opening up and innovation. By the end of 2017, the Park had achieved 65 reform deliverables according to the aforementioned plan, seven of them being replicated nationwide and 10 of them being promoted across Jiangsu province.

The SIP is at the forefront of national economic and technological development zones in terms of international cooperation, talent introduction and financial services. By the end of 2016, the number of China-foreign cooperative innovation centers in the park had increased from 13 to 21 at the end of 2014. The park has fully implemented the "Jinji Lake Double Hundred Talents Program", and pooled highly skilled talents. Among them, 143 have been selected into the national "Thousand Talents Program", of which 57 are enrolled in the "Thousand Talents Program" for entrepreneurs, accounting for nearly 7% of the total in China. The SIP created a new technology financial service model, and established the Dongsha Lake Equity Investment Center and the Venture Capital Center for National "Thousand Talents Program". The park encourages private capital to invest in the real economy, especially the innovative economy by various means, such as venture capital funds. The scale of venture capital funds has exceeded RMB 150 billion.

Box 15: A typical park of scientific and technological innovation[26]

7.3 IMPLEMENTATION OF PERFORMANCE EVALUATION

The comprehensive evaluation of a park is carried out once a year and is organized by relevant leading committees. Evaluation indicators deal with the previous year's data, and the evaluation results reflect the park's development compared with a year ago.

Evaluation procedures include data collection, preliminary review, re-examination, data sampling and processing, public notices, and result release.

[25] MOFCOM: Introduction of 30 year's development experience of Tianjin EDZ. http://ezone.mofcom.gov.cn/article/ab/201412/20141200826852.shtml

[26] Wang Weijian: Suzhou Industrial Park turns into an Innovative Park. http://js.people.com.cn/n2/2017/1025/c360301-30855587.html.

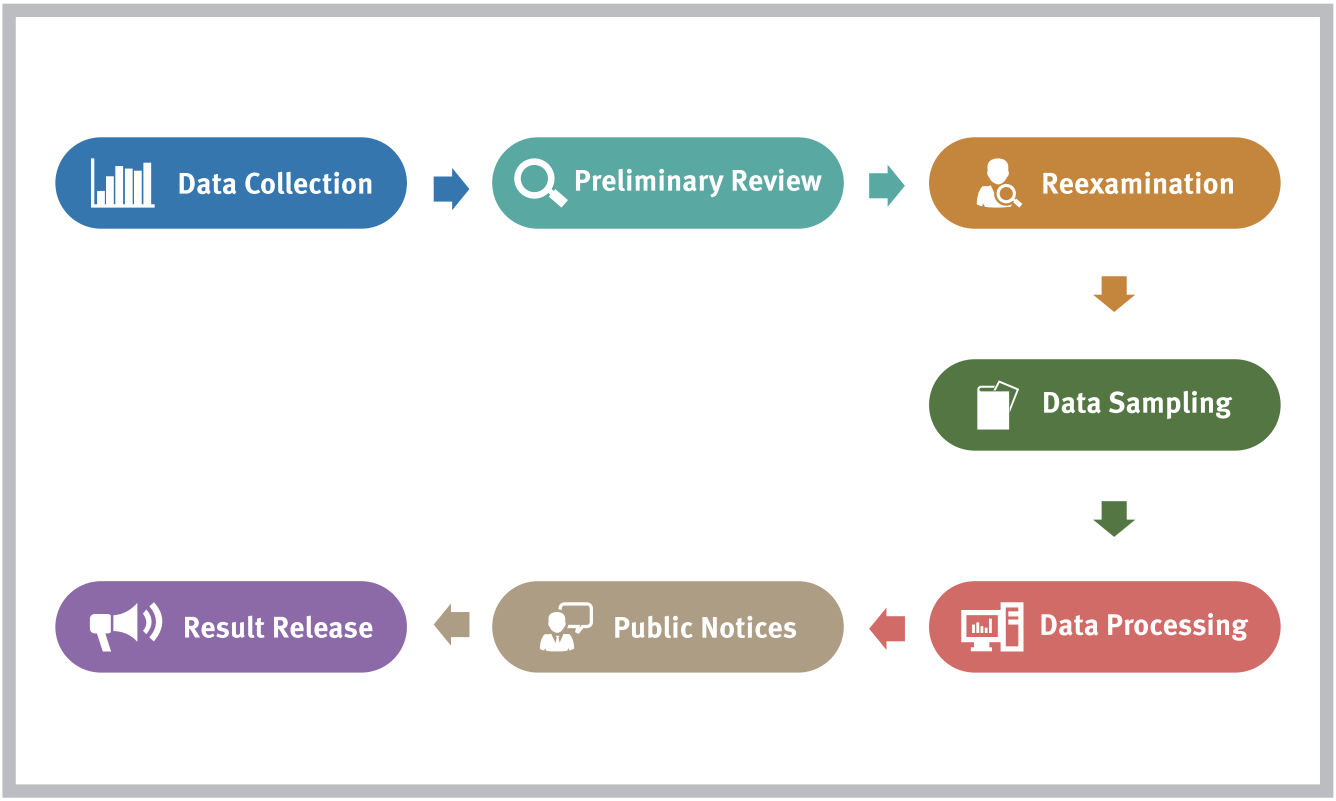


Figure 2: Flow chart for evaluation procedure

After evaluating the performance of a park, the relevant leading committees shall publish the result of the assessment. Industrial parks attaining a good assessment result are encouraged to share their management experience and promote the coordinated development of other parks. However, national economic development zones with two consecutive negative evaluations in the last five evaluation periods shall be downgraded after submitting the evaluation result to the State Council for approval in accordance with relevant procedures.

According to the 2018 performance evaluation result of national economic development zones (NEDZs) published by the Ministry of Commerce, the NEDZs enjoy a good development momentum, with major indicators remaining steady and progressive. They play an important role in driving economic and social development, and effectively promoting high-quality and sustainable development. The assessment provides the following recommendations for future improvement:

- **Further improve the quality and effects –** In 2017, the gross regional product of 219 national economic development zones was RMB 8.9 trillion, an increase of 9% year-on-year, accounting for 11% of China's GDP. The total import and export volume and that of high and new-tech products increased year-on-year by 12.9% and 10.1%, respectively.
- **Enhance the capacity for technological innovation –** As of the end of 2017, the NEDZs were home to 18,000 high and new-tech enterprises, accounting for 13.8% of all such enterprises in the country. They have more than 400 national incubators and makerspaces, and 57 invention patents per 10,000 people.

- **Promote regional development in a pragmatic manner –** In 2017, the proportion of foreign investment used by the NEDZs was 15.6%, 1.6 percentage points higher than the number in the previous year.

- **Lead the green development –** The NEDZs have been adhering to green, low-carbon and circular economy standards. In 2017, the value-added energy consumption, water consumption and major pollutant emissions per unit of large-scale industrial enterprises in the NEDZs all decreased significantly year on year, remarkably lower than the national average. As of late 2017, more than 14,000 enterprises from the 219 NEDZs had attained an ISO14000 certification.

- **Improve administrative efficiency constantly –** By the end of 2017, 179 of the 219 NEDZs had established online approval platforms for one-stop government service centers. And 183 of these had passed the ISO 9001 certification, accounting for more than 80% of all the NEDZs.

Box 16: Performance evaluation of national economic development zones[27]

[27] Note: The result is from the Comprehensive Evaluation Report of National Economic Development Zones 2017, released by the Bureau of Investment Promotion, the Ministry of Commerce.

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