Study on Planning of Tianjin Counties Industrial Park

Based on Recycling Economy Theory

1 Background

1.1 Low carbon and industrial development in a global view

Global resources are limited and unevenly distributed, and standards of environmental protection have become a key issue in international trade. Scientific development, sustainable development and a recycling economy are inevitable for China to embark on its own modern industrialization and Ecological Society.

1.2 China urbanism and industrialization

The economic development of China is immediately improving people's living standards. Faster growth of resource consumption, lower rates of resource utilization and lower rates of resource recovery are three factors combining to limit the resources needed to meet the demands of the high-speed development of the economy and China industrialization. At the same time, a lot of people transfer from rurual district to city along with the industrialization to acquire better work and living condition, and this increase the problem of urbanism.

1.3 Recycling economy development

The traditional extensive type of economic development characteristic of “high consumption and high pollution” causes imbalance in the ecology, and endangers the national quality of life. So the recycling economy with principle of reuse, ruduce and recycle become the new choice for the world.

1.4 Case study: Tianjin counties industrial park

Tianjin is located at the Bohai Sea Rim and Jingjinji area, and is one of the four

municipalities directly under the Central Government. After the development and opening-up strategy of Binhai New Area is implemented, the regional development advantages became obvious. And taking its county industrial park as example, a viable planning method can be explored.

2 Research scope and Definition

2.1 Tianjin counties

In 2005 overall planning of Tianjin, the urban planning scope is decided to be the administrative area of Tianjin, including central city and suburban area, with an area of 11917.3 square kilometers. The central city covers the main city park and Binhai New Area; the main city park includes central city park (area within the greening belt of the outer circle) and its outlaying areas (parts of Dongli District, Xiqing District, Jinnan District and Beichen District); Binhai New Area includes the administrative areas of Tanggu District, Hangu District and Dagang District as well as parts of Dongli District and Jinnan District. Suburban area means the suburban areas of Wuqing District, Baodi District, Ninghe County, Jinghai County and Jixian County.

The research scope of the paper is all the districts and counties except the 6 districts in urban area and Tanggu, including not only the four districts around the urban area, Hangu and Dagang which are gradually being brought into central city development, but also the five districts and counties in the suburban area, i.e., Wuqing, Baodi, Ninghe, Jinghai and Jixian[1].

2.2 Recycling economy industrial park

In early stage, such an industrial park is called Eco Industrial Park (EIP), and it is a

[1] Tianjin government, Tianjin city general plnning 2005-2020,2005

practice mode of recycling economy at meso-level, namely the recycling economy operation mode among enterprises. According to the division of development stages, namely “free emission, end-of-pipe treatment, cleaner production, eco-industry, recycling economy”, recycling economy industrial park is the newest period. It is a new industrial organization form designed and built on the basis of industrial ecology and recycling economy theory. Through simulation of natural systems, division of labor based on specialization of producer, consumer and decomposer within the industrial system is realized, and mutualism-based organization network is formed through food chain and food web within the industrial system. In such system, there is no waste, and “zero emission” to the natural environment is realized by the system. The most successful example of recycling economic industrial park is Kalundborg Industrial Symbiosis in Denmark.

The definition of ecologic industrial park given by the State Environmental Protection Administration (2003) is that ecologic industrial park is a new industrial park designed and built according to the requirement of cleaner production, recycling economy concept and principles of industrial ecology. Through transmission of material flow or energy flow, it links different plants or enterprises, forms combination of industrial symbiosis containing shared resource and exchanged by-product, and makes the waste or by-product of one factory the material or energy source of another factory. By simulation of the natural system, the circulation route of “producer—consumer—decomposer” is built in the industrial system, aiming at closed loop circulation of materials, multi-level utilization of energy and minimum generation of wastes. This definition described the internal characteristics of eco-industrial park on detailed basis, pointed out the circulation route of the park, and emphasized social

and environmental benefits[2].

Recycling economic industrial park is the name for eco-industrial park at its late development state, and it also embodies recycling economy. Recycling economic industrial park is a new form of industrial organization formed through designing or reconstruction by virtue of industrial ecology and recycling economic theory, and is China's third generation of industrial park after economic and technological development park and hi-tech technical park.

3 Tianjin counties industrial park development and feature

Tianjin is located at the Bohai Sea Rim and Jingjinji area, and is one of the four municipalities directly under the Central Government. After the development and opening-up strategy of Binhai New Area is implemented, the regional development advantages became obvious. In recent years, the construction of industrial parks has been quick, and the best approaches for planning are being explored.

3.1 The overall layout and structure of industrial land become more and more clear

Along with the adjustment of city development direction and industrial structure, Tianjin industrial land layout and structure gradually become clear, such structural features as radiation around the city, port aggregation, development along the road, etc. has been formed, which provides an effective guidance for the development of district/county industrial parks.

3.2 Construction of industrial parks becomes faster

According to the requirements of the municipal government, the districts and counties of Tianjin carried out preparation of pilot industrial parks inside the city in May 2009. According to the requirement of district/county industrial development, the following conditions and

[2] State Environmental Protection Administration, Planning Guide for Eco-Industrial Park, 2003

principles are identified for address selection: relying on small towns, with convenient traffic and with industrial foundation. Based on this, 31 industrial parks in 11 districts and counties were chosen the pilot industrial parks through comparison, and the recent construction scale reaches 136 square kilometers, which largely integrates the currently scattered industrial resources, shows industrial cluster effect, satisfies the requirement of intention development and intensive development, become an important measure for enhancing the economic strength and competitiveness of districts and counties, and plays an important role in promoting the joint development of rural residential communities, industrial parks and agricultural industrial parks.

3.3 Industrial agglomeration zone has been preliminarily formed

At present, industrial clusters with good development conditions are forming in Dongli, Xiqing and Beichen. Within the clusters, the industrial foundation is solid, the support from science and technology is obvious, the infrastructure of industrial parks has considerable sizes. However, because of some historical problems, there are some unreasonable points in the layout of industrial lands and deficiency in the construction of industrial chain, which influences the optimization of the overall industrial structure of the whole industrial structure, and thus timely adjustment is necessary for forming a good industrial agglomeration area and realizing better development.

3.4 Infrastructure like traffic etc. has obvious effect

At present, the advantageous geographic position of Tianjin as a harbor city promotes the construction and development of Lingang Industrial park, the well-developed highways facilitate the product flow from Tianjin to the surrounding areas, the upgrading of local

industrial level hastens the optimization of land layout and traffic structure. Both the current interests and the long-term development are considered, and the relationship between industrial land layout and traffic is gradually adjusted.

3.5 The output value of industrial land grows rapidly

Since the 21st century, industrial development in Tianjin has become faster, the total value and development speed have kept growing favorably. After 2002, the growth rate of gross industrial output value has always been over 20%. While the industrial output value in Tianjin increases, the total amount of industrial land reduces year by year, which mean that the unit output value of industrial land in Tianjin has always been increasing.

3.6 Energy saving effect is obvious

While industry develops rapidly in Tianjin, changing of economic growth mode is also focused on. Energy saving, consumption reduction, pollution removal and backward enterprise wash-out are regarded as the key points of reform, and the level of new industrialization rank come out top in China. Industrial water saving takes the first place in China, and the achievement of lots of indicators takes the lead, such as the water consumption for an industrial increment of 10000 yuan, industrial water recycling rate, comprehensive utilization of industrial solid waste, etc.

3.7 Functions of the industrial parks in the districts and counties are gradually improved, and the features become more obvious

Industrial parks in the districts and counties of Tianjin satisfy the development requirements of industrial cluster and recycling economy, are well coordinated with the development of small towns, with diversified types of industries inside and coexistence of

present class I, II and III industries , characterized by comprehensive vigor. Under the centralized guidance of urban and rural balanced development, coordinated and joint development of agriculture, industry and services is easier to realize, and the requirement on supporting services is higher.

4 Problems of the development of recycling economy in Tianjin counties industrial parks

The future development target of Tianjin is to become an international metropolis. For realizing this target, Tianjin must try hard to develop modern service industry, move the industries in the downtown area to the districts and counties, which requires higher level of district/county industrialization and construction quality. In recent years, the economy in the districts and counties of Tianjin has played a more and more important role in the advancement of the overall economy of Tianjin. However, some problems also occurred, including scattered layout, small development scale, low strength, low industrial concentration degree, repeated construction, vicious competition, environmental pollution, etc., and the construction level is far from satisfactory. In particular, there are still lots of problems to be solved for meeting the current requirement for the development of recycling economy[3].

4.1 Non-standard planning construction

There is no uniform planning and guidance for changing the non-standard situation of planning and construction of districts and counties. On the other hand, in district/county industrial park planning, no enough importance is attached to the development requirement of recycling economy. The development of recycling economy itself is also facing adverse conditions. Analyzing from the angle of economics, currently the construction of industrial

[3] TianYe,Xiao Yu, Gong Yuan, Research on Planning of Eco-Industrial Park,CItyPlanning Review 2007

parks for developing recycling economy involves such public items as environment, resource, etc. These public items do not have rivalry in consumption; as a result, the enterprises following the principle of "3Rs", engaging in recycling economy and attaching importance to environmental protection are restricted, and environmental resources are wastefully and inefficiently used.

4.2 Deficient planning theory

The theory of urban and rural planning is gradually improved. On the other hand, the system of policies, laws and regulations related to recycling economy are also to be improved.

4.3 Deficient system structure of recycling economy

At present, the construction of recycling economic industrial parks is a government action to a large extent. It focuses on environmental protection and emphasizes too much on environmental benefits and resource recycling, and the consideration of the system structure of recycling economic industrial parks and discussion on planning method are still not enough.

5 Tianjin counties industrial park developing strategy based on recycling economy theory[4]

5.1 Enhancing the construction of recycling economic industrial parks by methods suiting the local conditions

The development of recycling economy in the district/county industrial parks in Tianjin should follow methods suiting the local conditions, and diversified practical exploration should be carried out based on geography, development state and characteristics of different industries. The development mode of regional recycling economy depends on the development stage, technological and economic conditions, resource and environmental

[4] Tian Ye, Xiao Yu, Gong Yuan, Research on Planning of Eco-Industrial Park, City PlanningReview 2007 supplement:14-20

foundation and external development environment. For the districts and counties in Tianjin, the district/county economic system in the four districts around the urban area and Binhai New Area is more open and active. The design of recycling economy mechanism should focus on the multiplicity of resources, industry and technology transfer. During the course of inter-district resource industrial transfer, focus on the implementation of balancing mechanism and promote the formation and growth of energy-saving high-efficiency economic system; in the peripheral suburban districts and counties, the enhancement of resource production efficiency and effectiveness is regarded as the key issue, cleaner production is promoted in terms of production supply, the function of transfer from traditional economic growth mode and development mode is emphasized, sustained consumption is driven, and the development of recycling economy is directed in terms of demand.

5.2 Technological breakthrough and innovation

For developing the industrial parks in the districts and counties in Tianjin, science and technology investment must be increased and green technology support system must be set up. R&D is organized on resource saving and substituting technologies that are suitable for publicizing, energy cascade utilization technology, industrial chain/relevant industrial chain prolonging technology, “zero emission” technology, toxic and hazardous material replacement technology, recycling technology and green remanufacturing technology, so as to break through the bottleneck which restricts the development of recycling economy. Highly efficient usage of recycling economic industrial energy and conservative resource usage is realized through technological progress and technological innovation.

5.3 Perfect control mechanism

In order to realize the development target of recycling economy, the industrial park in the districts and counties of Tianjin shall first bring forward measures for adjustment and improvement, including polices on resource tax and prices for natural resource exploitation, environmental tax policies for end treatment and disposal, incentive policies for consumption, etc., green economic accounting system and incentive policies, etc. Secondly, relevant policies for different procedures like production, sales, consumption, recycling, etc. shall be prepared according to local conditions. In the planning stage, bring forward feasible industrial park development indicator system according to the overall positioning and development goals of industrial parks, and provide quantitative guidance basis for the construction and implementation of industrial parks.

5.4 Enhance district concept

In order to realize recycling economic development, industrial parks in the districts and counties of Tianjin must promote internal development of districts from a larger range, and carry out recycling economic planning on the level of cross-county administrative divisions. By applying the planning modes of regional coordination of development priority zone as well as regarding ecological function and development of the main functional divisions as the basis, use the method of material flow management to prepare district eco-industry development planning as the guidance. Restrict regional socio-economic activities within the bearing capacity of regional resource and environment, identify the socio-economic development trend, layout and structure as well as resource development and protection measures of the relevant eco-functional area according to the resource and environment bearing capacity, and

finally make the district/county industrial park an important link in the urban and rural balanced regional structure.

5.5 Emphasize on the integration of environmental and human factors

The planning industry should attach more importance to the planning of industrial parks, enrich planning methods, grasp the characteristics of the industry, enhance the study on the planning methods to be applied in the planning of district/county industrial parks integrating such concepts as low-pollution, low energy consumption, low-carbon, recycling, etc., and probe into and apply new concepts and technologies in the planning of industrial parks. Meanwhile, make a change in the planning concept that industrial parks are large, rough and dirty, emphasize on environmental philosophy and cultural factors, integrate industrial new-city concepts covering comprehensive residential function, production, leisure, etc., and realize the concept of circular ecology in a broader sense.

***5.6 Authorization of* technical specification code for planning of Tianjin counties industrial park based on recycling economy theory**

Planning of industrial parks in districts and counties is an overall arrangement of industrial development, land utilization, spatial layout and various constructions of districts and counties within a certain period in order to fit in with the industrial development in districts and counties. The regulations are formulated by deep study of recycling economy development idea, summarizing the experience in planning of demonstration industrial parks in districts and counties in Tianjin, and based on the new position and need in terms of industrial development of districts and counties in Tianjin. The regulations are applicable for the planning of industrial parks in districts and counties in Tianjin, while relevant planning

solutions of other provinces and cities can be referred to for execution.

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