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On Evaluating the Resources and Environment Management Level and Suggestions of Optimization Development in Industry Park

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Abstract. The paper establishes evaluation index system based on four quarters: industrial characteristics, utilization of resources and environment, environmental protection infrastructure construction, environment management system implementation, to evaluate utilization and management level of resources and the environment in the industrial park case. Recognition, analysis and optimization of development space from evaluation results in view of environmental protection. And the optimization development suggestions are proposed.

Keywords: evaluation index system; utilization of resources and environment.

1. Introduction

The industrial park is a regional complex of economic and social development and resource and environmental consumption. On the one hand, the enterprise shares the infrastructure in the park, avoids waste of resources, realizes economies of scale, promotes employment, and on the other hand, supplies resources and environmental protection to the park. Bringing tremendous pressure [1]. Therefore, systematically assessing and improving the utilization and management level of resources and environment in industrial parks, solving or alleviating the prominent environmental problems in industrial parks is of great significance for building ecological civilization, building beautiful China, and ensuring the coordinated and sustainable development of China's social economy and environment. At present, China's research and application of resource park environment utilization and management assessment of industrial parks mainly include the construction of national eco-industrial demonstration parks, the construction of circular economy, and the analysis of ecological efficiency. In 2015, China issued the "National Eco-industrial Demonstration Park Standards" (HJ274-2015), which has set up an evaluation system of 32 indicators from the aspects of economic development, industrial symbiosis, resource conservation, environmental protection, and information disclosure, which can reflect the industry to a certain extent. The resource and environment utilization and management level of the park, but it only sets a single indicator compliance limit and is mainly applicable to the construction and management of the national eco-industrial demonstration park, and the application scope is narrow. On the basis of analyzing the ecological efficiency theories and methods of industrial parks, Yanna and Fu Zeqiang constructed the circular economy evaluation index system of the park, and combined the TOPSIS method to evaluate the circular economy level of the industrial park [2]. Li Ren'an and Zhu Hui established a comprehensive evaluation index system for the development status of the park in Wuhan, and used the fuzzy comprehensive evaluation method to quantitatively evaluate it [3]. Sun Xiaomei et al. took the eco-industrial park of Yantai Economic and Technological Development Zone as an example, and used the analytic hierarchy process and the distance function model to evaluate the operational efficiency of the park [4]. The above research evaluates the development level of industrial parks from the perspectives of eco-industry and circular economy, and all reflect the evaluation requirements to a certain extent. On the one hand, it is mostly biased towards theoretical research, and the practicality of application management is low. Focusing on the development and utilization of industrial cycles, it is not closely related to the current environmental management requirements centered on environmental quality improvement. This paper attempts to construct a set of simple, easy and standardized indicator system for resource environment utilization and management level evaluation of industrial parks, quantitatively evaluate the resource environment utilization and management level of Tianjin High-

tech Industrial Development Zone (hereinafter referred to as the case park), and then based on the evaluation results. From the perspective of environmental protection, the identification of the case development of the park can optimize the space and the main problems, and put forward suggestions for optimizing the development, and provide reference for the environmental management of the industrial park.

2. Evaluation System Design

2.1 General Principles of Assessment

(1) Assessment purpose: By assessing the resource environment utilization and management level of the case park, systematically reviewing the status quo of the environmental management of the case park, identifying the space that can be improved and the main environmental problems from the perspective of environmental protection, and propose measures to solve the problem in a targeted manner. It is recommended to provide reference and basis for improving the environmental management level of the case park.

(2) General idea: From four aspects of layout and industrial characteristics, resource and environmental utilization, environmental protection infrastructure support and environmental management system, the indicator system is evaluated, and the resource environment utilization and management level of the case park is quantitatively evaluated based on the percentage system. The evaluation indicators and the secondary evaluation indicators characterize the status and characteristics of the case park, identify the industrial parks to optimize space and major environmental issues, and then propose optimizations in terms of industrial environmental access, resource optimization, financial policy support, and management acceleration and efficiency. Development proposals.

(3) Introduction to the park: The case park was approved by the State Council in 1991 to become a national high-tech zone. It is one of the earliest state-level high-tech zones in North China. The leading industries are electronic information, new energy, bio-pharmaceuticals and environmental protection and energy conservation. The area is 97.96 square kilometers.

2.2 Evaluation Indicator Setting

(1) Evaluation indicators: Implement layout and industrial characteristics, resource and environmental utilization, environmental infrastructure support and environmental management system as the first-level evaluation indicators for measuring the overall environmental performance level of industrial parks; The secondary evaluation indicators that characterize the content of the primary evaluation indicators constitute a complete evaluation indicator system.

(2) Evaluation criteria and benchmark scores: The assessment measures the primary assessment indicators and the secondary assessment indicators by the percentage system. The average industrial park level in Tianjin's environmental statistics information is used as the benchmark value, and the specific indicator ranges are considered. The standard conditions of 60 points, 75 points and 90 points are defined as 0 to 65, which are classified as poor, 66 to 79, and 80 to 100, respectively. For example, the smaller the unit's total output value is, the higher the score is. The average water consumption index of the statistical industrial park in Tianjin is taken as the reference value, which is set to 60 points, and the water consumption index reaches 3/5 of the reference value and is set to 75 points. , the score of 1 /2 of the reference value is 90 points. The actual value of the specific evaluation index is placed in the index limit interval corresponding to the defined boundary score, and the corresponding indicator benchmark score is interpolated. For qualitative indicators, the score is directly determined according to the set criteria [6].

(3) Method for determining the weight of indicators: Because the professional background, experience and accumulated experience of researchers are different, the weights given are different [6]. In order to make the weight setting relatively more objective and scientific, the determination of the weight must be combined with the Delphi method and the analytic hierarchy process [7]. A group of experts should compare the influencing factors to construct a judgment matrix; The two importance

comparison results are combined to determine the weight coefficient as the basis for determining the weight so that the weight value is determined to be more scientific.

Four primary assessment indicators and 20 secondary assessment indicators were developed through research. In this study, 10 experts and environmental management personnel with rich experience in atmospheric environmental protection, environmental planning, and environmental pollution control were invited to assign values to the weights of the two-level evaluation indicators.

Table 1. Level 1 evaluation indicator system and evaluation scores, weight statistics

Primary assessment indicator		
Park indicator name	Weights	Score
Layout and industry characteristics	26.5	73.7
Resource environment utilization	33.3	62.6
Supporting environmental infrastructure	21.1	88.6
Implementation of environmental management system	19.1	74.4
Weighted total score	100	73.3

2.3 Evaluation Results Calculation Method

The results of the evaluation are calculated using an exponential weighted summation method. On the basis of determining the basis scores of each evaluation index, according to the weight ratio, the scores of the indicators at all levels are calculated by weighting, and the accumulated value of the scores of the evaluated indicators is the evaluation score of the environmental management level in this aspect, and finally The evaluation score of the environmental management level of the industrial park is obtained.

The calculation formula is as follows:

$$p_{总} = \sum_{1}^{k} \{M_k \sum_{1}^{j} (N_j W_j)\}$$

Where: P is the total evaluation score of the case park; MK is the weight ratio of the kth indicator in the first-level evaluation index; Nj is the weight ratio of the j-th index in the second-level evaluation index; Wi is the basic evaluation index of the second-level evaluation index. The evaluation indicators, basic scores and weight determination results are shown in Table 1.

3. Optimized Space Recognition and Analysis

After weighting the basic scores and weight ratios of the first-level evaluation indicators and the second-level evaluation indicators of the industrial parks, the total score of the case industrial parks is 73. 3, which belongs to the middle level of 65-79 points, of which the layout of the park and The industrial characteristic score is 73.7 points, the resource and environment utilization score is 62. 6 points, the infrastructure support is 88.6 points, and the environmental management system is implemented 74. 4 points. The resource and environment utilization scores are relatively low. The statistics of the basic scores of each indicator and the weight ratio of the indicators are shown in Table 1.

Layout and industrial characteristics: There are no special sensitive environmental protection targets in the case park, which are less affected by sensitive protection targets; the leading industries are relatively clean industries such as electronic information, new energy, and cell engineering. (2) Environmental protection infrastructure: There is a centralized sewage treatment plant built in the case park. The supporting sewage pipe network in the park is perfect, the wastewater collection and treatment rate is 100%; the central heating rate is 100%; the comprehensive utilization rate of solid waste is 99. 4%, the rest are also disposed of, and the disposal rate of industrial solid waste (including hazardous waste) is 100%. (3) Environmental management: At present, the case park is promoting the planning environmental impact assessment of the new planning scope. There is an environmental

protection branch under the Case Park Management Committee, with independent environmental protection professional management agencies and full-time management personnel. The high-tech zone has a follow-up monitoring management plan and an environmental risk emergency plan. The environmental complaints have been under five times in the past three years, and the overall environmental management is in good condition.

4. Optimization Development Recommendations

4.1 Industrial Environmental Access

As an industrial cluster, the industrial park's resource consumption and pollutant discharge will greatly reduce the overall resource and environmental utilization level of the industrial park. The new park should set up a threshold for entry and clarify the requirements for industrial environmental access. For the expansion of the park, it should explore the potential for reducing consumption and reducing emissions, and improve the overall utilization of resources and environment. The case park should be rectified for industries with high energy consumption and high pollution.

4.2 Resource Optimization Configuration

For industrial parks with good or good scores, starting from the regulation of the total amount of government pollutant discharges, giving priority to preferential policies for purchasing pollutants from government stocks, implementing stepped electricity prices and ladder water prices, giving priority to ensuring water supply. And natural gas access, etc., to promote the improvement of the performance level of resource and environment utilization in industrial parks, and promote the optimization and upgrading of Tianjin's social and economic industries.

4.3 Financial Policy Support

Financial support was provided to the park and enterprises to improve pollution control facilities, environmental protection infrastructure, and improve pollutant removal efficiency. Provide green credit to compliance companies in the case park to support comprehensive environmental governance. Green fund support is recommended for enterprises with energy saving and environmental protection features, high technology content and good return prospects. Incentives for R&D and innovation, encourage and guide enterprises to increase R&D investment in environmental protection industry, and give certain research funding rewards and support according to their R&D investment. Different levels of resource and environment allocation and financial policy support are given to industrial parks that have been assessed as excellent and good.

4.4 Management Acceleration

It is recommended to integrate the relevant requirements of the industrial park “ecological protection red line, resource utilization on-line, environmental quality bottom line and negative list of industrial environmental access”, etc. into the industrial park planning implementation and environmental management, and to meet the management requirements of the enterprise environmental impact assessment project. Simplify the relevant procedures. For the parks that have adopted the planning EIA requirements, the EIA documents of the construction projects included in the plan may refer to the conclusions of the planning EIA, reduce the content or chapters of the EIA documents, and simplify the corresponding review content.

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