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Evaluation standard of Zero Carbon Park

零碳园区评价标准

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Foreword

This document is drafted in accordance with the rules of GB/T 1.1—2020 *Directives for standardization—Part 1: Rules for the structure and drafting of standardizing documents*.

The Zero Carbon China evaluation standard series is an integrated entity composed of fundamental common standards and specific evaluation criteria. This document represents one of the specific evaluation standards within the Zero Carbon China evaluation standard series, offering guidance for Zero Carbon Park evaluation.

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. The issuing body of this document shall not be held responsible for identifying any or all such patent rights.

This document was proposed and prepared by Investment Association of China.

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Evaluation standard of Zero Carbon Park

1 Scope

This document specifies the evaluation boundaries, basic requirements, bonus indicators, evaluation method, and evaluation process for Zero Carbon Park.

This document is applicable to guide the evaluation of Zero Carbon Park.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 36132, *General principles for assessment of green factory*

GB/T 50378, *Assessment standard for green building*

GB/T 50878, *Evaluation standard for green industrial building*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

Zero Carbon Park

A park that integrates various measures such as energy-saving, emission reduction, carbon sequestration, carbon sinks, and carbon trading to achieve a basic balance between carbon emissions and absorption during the evaluation period, utilizes energy resources efficiently, has a rational layout of industrial functions and operates with intelligent and efficient management

[Source: DB15/T 2948—2023.3.1, modified]

3.2

Carbon offset

The process by which reductions in greenhouse gas emissions outside the accounting boundary and carbon sinks are used by emission entities to compensate or offset greenhouse gas emissions within the boundary in the form of carbon credits, carbon sinks, etc.

[Source: DB33/T 2515—2022.3.9]

3.3

Carbon sink

Any process, activity, or mechanism that removes greenhouse gases such as carbon dioxide, aerosols, or greenhouse gas precursors from the atmosphere

3.4

Renewable energy

A type of primary energy source that can be replenished to some extent by natural processes on Earth

NOTE Primary energy includes solar energy, hydropower, wind energy, biomass energy, ocean energy, geothermal energy, etc.

[Source: GB/T 32910.4—2021, 3.3]

3.5

Green power

Electricity generated from renewable energy sources, such as wind and solar energy, utilizing specific power generation equipment, such as wind turbines and solar photovoltaic cells, etc., without generating environmentally harmful emissions or consuming fossil fuels

NOTE Green power includes wind power, solar photovoltaic power, geothermal power, biomass power, small hydropower, tidal power, etc.

[Source:DB33/T 2515—2022,3.11]

3.6

Green power certificates

Green certificates

The electronic certificates with unique code identification issued by the National Renewable Energy Information Management Center to qualified renewable energy power generation companies based on the grid-connected renewable energy volume, in accordance with the relevant administrative regulations of the National Energy Administration, through the Renewable Energy Power Generation Project Information Management Platform of the National Energy Administration.

[Source:Green power certificates issuance and voluntary subscription rules(Trial Implementation), Article 2]

3.7

Chinese-certified emission reduction;CCER

The amount of greenhouse gas emission reduction that have been quantitatively certified for renewable energy, forestry carbon sink, methane utilization and other projects within the territory of China and registered in the national greenhouse gas voluntary emission reduction trading registry system

[Source:Administrative Measures for Carbon Emissions Trading (Trial Implementation), Article 42]

4 Evaluation boundaries

The evaluation boundaries of the Zero Carbon Park shall include both:

- a) All direct emission processes that occur within the physical boundary of the park (including greenhouse gas emissions from fossil fuels consumed in the park's own or controlled boilers, furnaces, vehicles, and other sources, as well as greenhouse gas emissions from production processes).
- b) All indirect emission processes that occur within the physical boundary of the park (including greenhouse gas emissions from purchased electricity, heating, and cooling).

NOTE The physical boundary refers to a park with legal boundaries, scope and unified management body, or blocks that can be counted independently.

- c) The greenhouse gases covered in this document are mainly carbon dioxide (CO_2), other greenhouse gases such as nitrous oxide (N_2O), methane (CH_4), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), hydrofluorocarbons (HFC_s), perfluorocarbons (PFC_s) may be included depending on the energy consumption and processes of the factory.

5 Basic requirements

5.1 The park shall possess well-defined geographical and statis-

tical boundaries, clearly identified responsible entities, and have no record of significant environmental pollution or ecological damage incidents within the past three years.

5.2 The industries, processes, and equipment of the park shall comply with the industry access conditions set by the national and/or local regulations.

5.3 The discharge indices of various pollutants within the park shall comply with the provisions of the currently relevant national standards.

5.4 The park shall comply with the requirements of pertinent laws, regulations, standards, and policies concerning energy conservation and carbon emission control while maintaining regular production and operations.

5.5 The senior executives of the park shall appoint an specific individual, within the top management tier, to be responsible for overseeing and managing the low-carbon operation of the park. The senior executives shall also specify a comprehensive low-carbon managing department, formulate protocols for low-carbon operation and management, establish methods for management evaluation and assessment, and create mechanisms for inter departmental coordination.

5.6 The park shall establish and improve the statistical reporting system for low-carbon operation and management, and have a complete measurement system that can be integrated into the local government statistical department.

5.7 The park shall identify zero carbon emission pathways and implementation programs, set forth annual energy saving and carbon reduction goals, and clarify the division of responsibilities between park managers and enterprise managers.

5.8 The park shall formulate and implement a system for the admission and exit of enterprises, so that admission to the park is strictly limited to enterprises with high energy consumption, high emissions, and high pollution.

6 Evaluation indicators

The evaluation indicators system of Zero Carbon Park consists of first-level indicators and second-level indicators, of which the primary indicators have specific weights. The evaluation indicators system is shown in Table 1, and the illustration of the evaluation indicators is presented in Annex A.

Table 1—Zero Carbon Park evaluation indicators system

First-level indicators	Number	Second-level indicators	Unit	Benchmark value	Note	Score	Weight
Economic development	1	Industrial added value per capita of the park	ten thousand yuan per person	≥ 15	One of the three	100	10%
	2	Average annual growth rate of the total output value of the park	%	≥ 20			
	3	The proportion of the total output value of high-tech enterprises in the total value of the park	%	≥ 40			
Energy utilization	4	Energy output rate	ten thousand yuan/tce	≥ 8	Required	30	25%
	5	Self-produced and self-used green energy	—	Yes	Required	35	
	6	The proportion of green power use	%	≥ 80	One of the two	35	
	7	The proportion of renewable energy use	%	≥ 50			

Table 1—Zero Carbon Park evaluation indicators system (continued)

First-level indicators	Number	Second-level indicators	Unit	Benchmark value	Note	Score	Weight
Infrastructure	8	The proportion of green industrial buildings in the new industrial buildings	%	≥30	One of the two	20	25%
	9	The proportion of green buildings in the new public buildings	%	≥95			
	10	The proportion of new energy vehicles in the park-owned vehicles	%	≥80	Required	20	
	11	The proportion of parking spaces with charging pile facilities	%	≥60	Required	10	
	12	The proportion of afforestation areas of park	%	≥15	Required	10	
	13	The proportion of green factory	%	≥15	Required	10	
	14	The proportion of zero-carbon factory	%	≥10	Required	10	

Table 1—Zero Carbon Park evaluation indicators system (continued)

First-level indicators	Number	Second-level indicators	Unit	Benchmark value	Note	Score	Weight
Infrastructure	15	The proportion of floor area (or the proportion of total floor area) occupied by zero-carbon buildings	%	≥10(or 5)	One of the two	10	25%
	16	The proportion of floor area (or the proportion of total floor area) occupied by near-zero energy/zero energy buildings	%	≥10(or 5)			
	17	Centralized wastewater treatment facilities	—	Meet	One of the two	10	
	18	Rain collection and utilization facilities	—	Meet			
Resource conservation and environmental protection	19	The recycling rate of renewable resources	%	≥90	One of the two	35	
	20	The comprehensive utilization rate of industrial solid waste	%	≥80			15%

Table 1—Zero Carbon Park evaluation indicators system (continued)

First-level indicators	Number	Second-level indicators	Unit	Benchmark value	Note	Score	Weight
Resource conservation and environmental protection	21	Fresh water consumption per unit of industrial added value	m ³ /ten thousand yuan	≤6	One of the three	35	15%
	22	The reuse rate of industrial water	%	≥90			
	23	The reuse rate of reclaimed water	%	≥35			
	24	The disposal rate of hazardous waste	%	100	Required	30	
Operation management	25	Statistical reporting system	—	Yes	Required	10	20%
	26	Supervision and management system	—	Yes	Required	10	
	27	Zero carbon development special funds/policies	—	Yes	Required	5	
	28	The supervision and management platform of energy/carbon emission	—	Yes	Required	20	

Table 1—Zero Carbon Park evaluation indicators system (continued)

First-level indicators	Number	Second-level indicators	Unit	Benchmark value	Note	Score	Weight
Operation management	29	Digital/smart management system	—	Yes	Required	20	20%
	30	The proportion of enterprises' carbon verification or inventory	%	100	Required	10	
	31	The establishment of Zero Carbon Park management organization	—	Yes	Required	10	
	32	The regular disclosure of carbon emission information	—	Yes	Required	5	
	33	The R & D and application of carbon reduction technology	—	Yes	Required	10	
Emission reduction performance	34	The achievement of carbon emission reduction targets	—	Completed	One of the two	100	5%
	35	The contribution of carbon emission output value per unit	ten thousand yuan/tCO ₂	≥5			

7 Bonus indicators

The Zero Carbon Park bonus indicators is shown in Table 2.

Table 2—The Zero Carbon Park bonus indicators

Indicators	Evaluation requirements	Score
Smart energy storage system	The park has established a smart energy storage system, which operates normally to achieve peak shaving and valley filling. This system helps alleviate the strain of peak energy consumption in the park, and serves as an emergency power supply	2
	The smart energy storage system is linked to energy units with distributed photovoltaic and charging equipment in the park, facilitated by the park's the digital/smart management system	2

8 Evaluation method

8.1 The park applying for the evaluation shall first meet all the requirements specified in Clause 5.

8.2 After meeting the requirements of Clause 5, the evaluation indicators and bonus indicators shall be assessed and scored sequentially. The overall evaluation score shall be the sum of the scores of the evaluation indicators and bonus indicators, with a

maximum score of 100 points.

8.3 The evaluation body shall adopt a comprehensive scoring method according to the evaluation indicators system.

The overall score of the evaluation is calculated according to Formula(1):

$$S = \sum_{i=1}^n W_i F_i \quad (1)$$

where

S is the total score of the evaluation;

n is the number of First-level indicators;

W_i is the weight of First-level indicators;

F_i is first-level evaluation indicators score.

NOTE The score of the first-level evaluation indicators is the sum of the scores of all second-level indicators under the first-level indicators.

8.4 For the qualitative evaluation indicators of the second-level indicators, if the actual circumstances align with the benchmark values, the full score for the indicators can be achieved; on the contrary, if the benchmark values are not met, the score is zero.

8.5 For the quantitative evaluation indicators from the Second-

level indicators(except freshwater consumption per unit of industrial added value), the calculation method of the score is shown in Formula(2):

$$S_{dl} = \frac{F_s}{F_y} \times S_y \quad (2)$$

where

S_{dl} is the score of the second evaluation indicators;

F_s is the actual value of the quantitative evaluation indicators;

F_y is the benchmark value of the quantitative evaluation indicators;

S_y is the score corresponding to the benchmark value of quantitative evaluation indicators.

NOTE 1 If the actual value of quantitative indicators is higher than the benchmark value, the highest score of the indicators can be obtained directly.

NOTE 2 The calculation results are rounded up and retained to two decimal places.

The calculation method for the evaluation indicators *freshwater consumption per unit of industrial added value* is depicted in Formula(3):

$$S_{dl} = \frac{F_s}{F_y} \times S_y \quad (3)$$

The symbols and annotations used in formula(3) are consistent with those in Formula(2)

8.6 The grade of Zero Carbon Park is categorized into three hierarchies, ranked from highest to lowest: Zero Carbon Park three stars, Zero Carbon Park two stars, Zero Carbon Park one star. The grades of Zero Carbon Park are detailed in Table 3.

Table 3—The Grades of Zero Carbon Park

Grade	Grading indicators	Corresponding Level
Zero Carbon Park three stars (★★★)	$S \geq 95$	Zero carbon
Zero Carbon Park two stars (★★)	$95 > S \geq 85$	Near zero carbon
Zero Carbon Park one star (★)	$85 > S \geq 70$	Low carbon

8.7 The Zero Carbon Park evaluation certificate holds validity for a duration of five years and requires re-evaluation upon expiration. A third-party evaluation body shall conduct a re-evaluation in the third year of validity period. The grade shall be maintained or adjusted according to the re-evaluation outcomes. The evaluation results shall be withdrawn for a Zero Carbon Park under any of the following circumstances:

—Failing to participate in the re-evaluation as required;

- Providing false materials and data;
- Experiencing significant safety, environmental, quality and other accidents and being penalized by the relevant authorities.

9 Evaluation process

9.1 Overview

The Zero Carbon Park evaluation encompasses four stages: preparation stage, implementation stage, evaluation stage and continuous improvement stage.

9.2 Preparation stage

9.2.1 The park proposes the implementation plan

The park shall compile its fundamental conditions, components and structures, evaluate the park's low-carbon development stage, devise zero-carbon implementation plans which shall be documented and published. The implementation plan must, at a minimum, encompass the following information:

- a) The statement of the Zero Carbon Park commitment;
- b) Carbon emission accounting boundaries of the Zero Carbon Park;

- c) Target and timetable for the planned realization of the Zero Carbon Park;
- d) Strategies to reduce greenhouse gas emissions, including the specific details and reasons for strategy selection, emission reduction baseline and emission reduction targets;
- e) Carbon removal and/or offsetting strategies to achieve a zero-carbon park and maintain carbon neutrality, including specifics and rationale for selection.

9.2.2 Establishment of greenhouse gas management system and institution

The park shall establish the greenhouse gas emission management system in accordance with relevant laws, regulations, policies, and standards, as well as its scale, capacity, and demand.

9.3 Implementation stage

9.3.1 Implement greenhouse gas emission reduction

The park shall adopt appropriate greenhouse gas emission reduction strategies to ensure the achievement of the emission reduction goals set out in the plan. The measures include but are not limited to:

- a) Implementation of direct emission reduction measures, i.e., the adoption of appropriate GHG emission reduction strategies in light of their actual situation, such as increasing the

substitution of renewable energy sources and carbon-considering raw materials, the adoption of process upgrading and energy-saving measures, etc. ;

- b) Implementation of indirect emission reduction measures, i. e., the development of carbon-reduction projects outside the boundaries according to its own capability.

9.3.2 Implementing carbon offsets

9.3.2.1 Purchase of carbon credits

The park can purchase carbon credits to offset the remaining emission reduction after the implementation of the emission reduction activities. Eligible carbon credits encompass, but are not confined to:

- a) CCER;
- b) Emission reductions from carbon-inclusive projects that have been approved, filed or recognized by the government;
- c) Voluntary Emission Reductions (VER) of the Gold Standard (GS), Verified Carbon Units (VCU) of the Verified Carbon Standard (VCS), Certified Emission Reductions (CER) of the Clean Development Mechanism (CDM), etc. ;
- d) Other carbon credits approved, recorded or recognized by authoritative institutions.

9.3.2.2 Purchase of green certificates

For the carbon emissions generated by electricity usage, the park can offset them by purchasing green certificates.

9.3.2.3 Self-developed carbon emission reduction projects

The park can independently develop emission reduction projects outside the physical boundary for carbon offsets, and the self-developed projects may include but are not limited to the following ways:

- a) Certified emission reductions generated by self-developed emission reduction projects outside the boundary;
- b) Developing and adopting GHG sinks/offsets, which means independently construction certified GHG sinks outside the accounting boundaries.

9.4 Evaluation stage

9.4.1 Evaluation method

9.4.1.1 The evaluation of Zero Carbon Park can be implemented by the first party, the second-party or the third-party organization. When the evaluation results are used for external claims, the evaluators shall be third-party organizations that are independent of the park and has appropriate capabilities.

9.4.1.2 Before carrying out the second-party or third-party

evaluation, the evaluation subject shall complete self-evaluation. The third-party evaluation body shall collect evaluation evidence by reviewing report documents, statistical reports, original records, and, as appropriate, conducting relevant personnel interviews, field surveys, sample surveys and other methods to ensure the integrity and accuracy of the evidence.

9.4.1.3 The Zero Carbon Park evaluation shall be implemented after the park has passed delivery acceptance and maintained normal operation for one year, and the evaluation period follows a natural annual cycle.

9.4.2 Evaluation Certificate

The park that passes the third-party evaluation can obtain the Zero Carbon Park certificate, which includes but not limit to the following contents:

- a) Code and name of this document;
- b) Basic information about the park;
- c) Greenhouse gas accounting boundaries and emissions of the park;
- d) The grade of the Zero Carbon Park;
- e) The validity period of the zero-carbon certificate of the park.

9.5 Continuous improvement stage

The park shall continuously improve the management of greenhouse gases within its boundaries to ultimately achieve or continuously maintain zero carbon emission status.

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Annex A (Normative)

The illustration of the evaluation indicators

The illustration of the evaluation indicators specification is shown in Table A.1.

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Table A.1—The illustration of the evaluation indicators

First-level indicators	Number	Second-level indicators	Unit	Illustration
Economic development	1	Industrial added value per capita of the park	ten thousand yuan/person	Industrial added value per capita created by the employee of industrial enterprises in the park. Calculation formula: Industrial added value per capita (ten thousand yuan/person) = Industrial added value of the park (ten thousand yuan) / The number of employees of industrial enterprises at the end of the period (person)
	2	Average annual growth rate of the total output value of the park	%	The three-year average annual growth rate of the total output value of the park. Calculation formula: Three-year average annual growth rate of the total output value of the park (%) = $\left[\left(\frac{\text{Total output value of the current year}}{\text{Total output value of the park three years ago}} \right)^{1/3} - 1 \right] \times 100\%$

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Economic development	3	The proportion of the total output value of high-tech enterprises in the total value of the park	%	The ratio of the total output value of high-tech enterprises in the park to the total output value of the park. Calculation formula: The proportion of the total output value of high-tech enterprises to the total industrial output value of the park(%) = The sum of the output value of the high-tech enterprises in the park (ten thousand yuan) / The total output value of the park (ten thousand yuan) × 100%. In the formula, high-tech enterprises refer to the high-tech enterprises recognized according to the national <i>Administrative Measures for the Recognition of High-tech Enterprises</i>
Energy utilization	4	Energy output rate	ten thousand yuan/ tce	The ratio of the total output value of the park to the total energy consumption serves as an indicator of energy efficiency, with a higher value denoting greater efficiency in energy utilization. Total energy consumption refers to the consumption of coal, electricity, oil and other energy used for production and daily activities in the park. All kinds of energy are converted into standard coal equivalents. Calculation formula: Energy output rate (ten thousand yuan/ tce) = Total output value of the park (ten thousand yuan) / Total energy consumption (tce)

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Energy utilization	5	Self-produced and self-used green energy	—	The park shall leverage available resources such as rooftops and roofing and etc. to autonomously construct or employ the energy management contract approach to establish renewable energy utilization facilities such as photovoltaic power generation, power generation, solar thermal collectors, ground source heat pumps, air source heat pumps, etc. . . . When the renewable energy system operates in parallel with the conventional energy system, priority shall be granted to the operation of the renewable energy system. Renewable energy system energy output, self-use shall be measured separately
	6	The proportion of green power use	%	The ratio of the green power use of the park to the total electricity consumption of the park. The park can achieve zero-carbon power consumption by participating in green power market-based trading, purchasing green certificates or direct green power trading. Calculation formula: The proportion of green power use of the park(%) = Green power use of the park(kW · h)/Total power consumption of the park(kW · h)

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Energy utilization	7	The proportion of renewable energy use	%	<p>The ratio of renewable energy use to the park's total energy consumption. Renewable energy includes solar energy, hydro-power, biomass energy, geothermal energy, hydrogen energy, tidal energy and other non-fossil energy sources.</p> <p>Calculation formula: The proportion of renewable energy use (%) = Renewable energy use of enterprises in the park (tce) / Total energy consumption (tce) × 100%.</p> <p>NOTE The molecular term in the formula includes green power use.</p>
Infrastructure	8	The proportion of green industrial buildings in the new industrial buildings	%	<p>The green industrial building refers to the industrial buildings that undergo evaluation in accordance with GB/T 50878 and attain a rating of one star or above.</p> <p>Calculation formula: The proportion of green industrial buildings in new industrial buildings (%) = The area of green industrial buildings in new industrial buildings (m²) / The area of new industrial buildings of the park (m²) × 100%</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Infrastructure	9	The proportion of green buildings in new public buildings	%	<p>The green building refers to public buildings that undergo evaluation according to GB/T 50378 and attain a rating of one star or above.</p> <p>Calculation formula: The proportion of green buildings in new public buildings(%) = The area of green buildings in new public buildings(m^2) / The area of new public buildings of the park (m^2) \times 100%</p>
	10	The proportion of new energy vehicles in the park owned vehicles	%	<p>The ratio of new energy vehicles owned in the park to all owned vehicles(excluding staff's private cars).</p> <p>Calculation formula: The proportion of new energy vehicles to owned vehicles in the park(%) = The number of owned new energy vehicles in the park (\timesvehicles) / Total number of all owned vehicles in the park(\timesvehicles) \times 100%</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Infrastructure	11	The proportion of parking spaces with charging pile facilities	%	<p>The proportion of parking spaces with charging pile facilities (including reserved) to the total number of parking spaces of the park.</p> <p>Calculation formula: The proportion of parking spaces with charging pile facilities(%) = Parking spaces with charging pile facilities (nos.) / Total number of parking spaces of the park (nos.) × 100%</p>
	12	The proportion of afforestation areas of park	%	<p>The proportion of all types of afforestation areas in the park to the total area of the land within the planning scope of the park.</p> <p>Calculation formula: The green coverage rate of the park (%) = Total area of all types of green spaces in the park(m²) / Total area of land in the park(m²) × 100%</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Infrastructure	13	The proportion of green factory	%	<p>The green factory has been evaluated according to GB/T 36132, achieving land intensification, using non-hazardous raw materials, adopting cleaner production processes, recycling waste, and the adopting low-carbon energy sources.</p> <p>Calculation formula: The proportion of green factory(%) = The number of green factory in the park(nos.)/The number of all factories in the park(nos.) × 100%</p>
	14	The proportion of zero-carbon factory	%	<p>Zero-carbon factory has been evaluated according to the Zero Carbon Factory evaluation standards and has been certified as zero-carbon factories.</p> <p>Calculation formula: The proportion of Zero Carbon Factory(%) = The number of zero-carbon factory in the park(nos.)/The number of all factories in the park(nos.) × 100%</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Infrastructure	15	The proportion of floor area(or the proportion of total floor area) occupied by zero-carbon buildings	%	Zero-carbon building refers to the building with zero carbon emissions.The building does not rely on coal,oil,electricity, etc.,and all the energy consumption throughout the year is provided by renewable energy generated by the site. Calculation formula: The proportion of zero carbon building to floor area (%) = The area of zero-carbon building in the park (m ²) / The total area of floor area in the park(m ²) × 100%. The proportion of zero-carbon building to the total building area(%) = The area of zero carbon building in the park(m ²) / The total area of building in the park(m ²) × 100%
	16	The proportion of floor area(or the proportion of total floor area)occupied by near-zero energy/zero energy buildings	%	Near zero carbon building refers to the building that meets the requirements of near zero energy building according to the evaluation of GB/T 51350. Calculation formula: The proportion of near zero energy building to the area of floor area(%) = Near-zero-energy building area in the park(m ²) / total aboveground floor area in the park (m ²) × 100%. Proportion of near-zero-energy-consumption buildings to total building area (%) = near-zero-energy-consumption building area in the park(m ²) / total building area in the park(m ²) × 100%

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Infrastructure	17	Centralized waste water treatment facilities	—	All wastewater in the park shall undergo pretreatment to adhere to centralized treatment standards before being directed to a centralized wastewater treatment facility (located either within or outside the park) equipped with automatic online monitoring devices
	18	Rain collection and utilization facilities	—	After collecting rain in the park according to the demand, the collected rain will be filtered and purified to meet the design and use standards of the collection and utilization facilities (located either within or outside the park)

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Resource conservation and environmental protection	19	The recycling rate of renewable resources	%	<p>The degree of recycling of renewable resources by resource recycling enterprises in the park, namely the ratio of the recycling volume of renewable resources by the resource recycling industrial enterprises in the park to the volume of renewable resources collected.</p> <p>Calculation formula: The recycling rate of renewable resources (%) = $\frac{\text{The recycling volume of renewable resources (ten thousand tons)}}{\text{The volume of renewable resources collected (ten thousand tons)}} \times 100\%$.</p> <p>Resource recycling industry is based on the premise of ensuring environmental security as the premise, for the purpose of saving resources and protecting the environment, and the use of advanced technology to transform the waste generated in the process of production and consumption into reusable resources and products, to achieve the reuse and resource of all kinds of waste industry, including waste into renewable resources and renewable resources processed into products in two processes</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Resource conservation and environmental protection	19	The recycling rate of renewable resources	%	Renewable resources refer to metallic scrap, discarded electronic products, mechanical and electric equipment and parts, wastepaper making materials (such as waste paper, waste cotton, etc.), waste materials for light chemical industry (such as rubber, plastics, packing of pesticide, animal bones, hairs, etc.), waste glass as well
	20	The comprehensive utilization rate of industrial solid waste	%	The ratio of the utilization of industrial solid waste disposed in the park in the current year (including hazardous waste) and the total amount of industrial solid waste generated in the park in the current year. Calculation formula: The comprehensive utilization rate of industrial solid waste (%) = $\frac{\text{The utilization of industrial solid waste disposed in the park in the current year (including hazardous waste)} (t)}{\text{The total amount of industrial solid waste generated in the park in the current year}} \times 100\%$

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Resource conservation and environmental protection	21	Fresh water consumption per unit of industrial added value	m ³ /ten thousand yuan	<p>The amount of fresh water consumed per unit of output value in the park.</p> <p>Calculation formula: Fresh water consumption per unit of output value(m³/ten thousand yuan) = The total freshwater consumption in the park(m³)/The total output value of the park (ten thousand yuan)</p>
	22	The reuse rate of the industrial water	%	<p>The ratio of industrial water reuse used by industrial enterprises in the park in the production process to the total amount of industrial water.</p> <p>Calculation formula: The reuse rate of the industrial water(%) = Industrial water reuse(m³)/The total industrial water consumption(m³) × 100%</p> <p>In the formula, industrial water reuse consumption refers to the sum of all untreated and treated reused water used by industrial enterprises in the park within the identified water use unit or system, namely the sum of recycled water and tandem water</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Resource conservation and environmental protection	22	The reuse rate of the industrial water	%	<p>Recycled water refers to the water that has been used in the production process and recycled for use in the same process within identified water use units or systems. Tandem water refers to the water generated or used in the production process within an identified water use unit or system that is reused in another unit or system.</p> <p>The total industrial water consumption refers to the sum of all types of water used by industrial enterprises in the park within identified water use units or systems, namely the sum of industrial fresh water consumption and industrial reused water consumption</p> <p>The ratio of the amount of reclaimed water reused in the park to the total amount discharged from the sewage treatment plant.</p>
	23	The reuse rate of reclaimed water	%	<p>Calculation formula: The reuse rate of reclaimed water(%) = The amount of reclaimed water reuse in the park(tons)/The total amount of discharge of waste water treatment plant in the park(tons) × 100%</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Resource conservation and environmental protection	23	The reuse rate of reclaimed water	%	Reclaimed water refers to collected rainwater, industrial and domestic wastewater collected, either with or without sewage treatment plants, that's been properly treated to meet the quality standards for reuse. Reuse involves employing this treated water for purposes like groundwater replenishment, industrial applications, agricultural practices, forestry, livestock farming, non-potable urban water supply, as well as landscape and environmental water usage
	24	The disposal rate of hazardous waste	%	<p>Calculation formula: The disposal rate of hazardous waste(%)</p> <p>= The amount of hazardous waste disposed of the park (tons)/The total amount of hazardous waste generated of the park(tons) × 100%</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	25	Statistical reporting system	—	<p>The park shall establish the sound statistical reporting system for low carbon operation and management, including but not limited to:</p> <ul style="list-style-type: none"> a) Supervise enterprises to equip specialists responsible for the statistical reporting of data related to low carbon operation and management, and standardize data sources, submission methods and accounting methods. b) The scope of statistical data includes, but is not limited to: the variety and volume of energy consumption, carbon emissions, the type and quantity of new energy utilization, water resources, waste resource recycling and comprehensive utilization, green building certifications, the proportion of green travel and low-carbon management; c) Based on the statistical data, compile a low carbon operation statistical report

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	26	Supervision and management system	—	<p>The park shall establish a set of low carbon operation and management supervision protocols, the content shall include but is not limited to:</p> <ul style="list-style-type: none"> a) Guide and supervise enterprises to regularly carry out energy-saving monitoring as per GB/T 15316. Facilitate the enforcement of mandatory energy consumption and energy efficiency standards to achieve the progress towards low-carbon operation and management targets. Promptly rectify enterprise practices that hinder the attainment of these objectives. b) Supervise enterprises to regularly carry out energy measurement reviews and energy audits in accordance with GB/T 17166 and GB 17167. Conduct energy efficiency diagnosis and benchmarking. Establish a notification system for enterprise management to track low-carbon operational performance. Supervise enterprises to take effective measures to improve the level of low-carbon operation management performance

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	26	Supervision and management system	—	<p>c) Guide and supervise enterprises' comprehensive energy consumption to meet the requirements of national energy consumption quota standards, produce energy-using products with energy efficiency to meet the standard requirements for national energy efficiency. Encourage enterprises to establish and implement energy management systems in accordance with GB/T 23331 and GB/T 29456. Supervise and manage key enterprises whose annual energy consumption exceeds the national or local regulations, provide remediation suggestions, monitor enterprise compliance, and track rectification outcomes.</p> <p>d) Supervise key emission units and reporting units required by national or local requirements to regularly carry out carbon verification and carbon emission reporting. Encourage enterprises to establish carbon emission management systems</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	27	Zero carbon development special funds/policies		To ensure the establishment and progression of a zero-carbon environment, the park specially arranges capital budgets or issues relevant policies to guide and support the park and its enterprises to achieve zero-carbon targets
	28	The supervision and management platform of energy/carbon emission	—	<p>The park shall construct and use energy monitoring management and carbon emission monitoring management platforms, which encompass, but are not restricted to:</p> <ul style="list-style-type: none"> a) Develop an energy metering system to realize real-time collection and monitoring of water, electricity, natural gas and other energy use in the park; b) Establish an information system to manage carbon assets in the park through digital means; c) Create an information system to generate energy consumption and low-carbon indices and oversee the achievement of these indices using the system

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	29	Digital/smart management system	—	<p>The park shall establish the low carbon operation digital/smart management information system, including but not limited to:</p> <p>a) Establish a direct data reporting and evaluation system for the low-carbon operation and management performance indicators of enterprises in the park. Regularly release information regarding the low-carbon operation and management level of the park and enterprises. Publish a list of enterprises subject to compulsory energy audits and cleaner production assessments, along with their corresponding audit outcomes.</p> <p>b) Release statistical reports on low-carbon operation and management of the park. Disseminate details on low-carbon laws and regulations, policies and systems, technology patents and standards. Publish corporate environmental reports, social responsibility reports and sustainable development reports to facilitate public oversight and accountability</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	29	Digital/smart management system	—	<p>c) Establish a waste exchange(or trading)system to provide waste exchange(or trading)information for enterprises in the park, so that waste resources can be reasonably centralized, configured and exchanged among enterprises and in society;</p> <p>d) Establish the park network reporting organization and mechanisms to share information and report early warning information. The network shall cover all key infrastructure of the park, and timely rectify reported incidents or hidden dangers</p>
	30	The proportion of carbon verification or inventory of enterprises	%	<p>The ratio of the number of enterprises carrying out carbon verification or inventory to the number of all enterprises in the park.</p> <p>Calculation formula: The proportion of carbon verification or inventory of enterprises (%) = $\frac{\text{The number of enterprises carrying out carbon verification or inventory in the park}}{\text{The number of all enterprises in the park}} \times 100\%$</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	31	The establishment of Zero Carbon Park management organization	—	<p>The park shall set up zero-carbon work management institutions to provide organized guarantees for conducting related tasks within the park.</p> <p>(a) Embrace green, zero-carbon development as a systematic and comprehensive project, integrating the relationships between economic growth, low-carbon transformation and green production in the park; Formulate plans for a green and intelligent Zero Carbon Park.</p> <p>b) Organize various forms of publicity and training activities, including but not limited to:</p> <p>① Enhance enterprises' awareness of the importance and urgency of low-carbon development through exhibitions and symposiums, and gradually transform energy resource conservation and comprehensive utilization into conscious behavior;</p>

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	31	The establishment of Zero Carbon Park management organization	—	<p>② Periodically arrange training sessions for senior management within enterprises, introduce advanced domestic and international energy, comprehensive utilization of resources, technologies and equipment to park-based enterprises, and encourage enterprises to adopt cutting-edge technology and equipment.</p> <p>③ Promote and enforce laws, regulations, policies, and standards related to low-carbon initiatives, and guide enterprises to conscientiously implement</p>
	32	The regular disclosure of carbon emission information	—	The regular disclosure of carbon emission information of enterprises in the park

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Operation management	33	The R & D and application of carbon reduction technology	—	<p>The park provides technical support for low carbon operation and management, including but not limited to:</p> <ul style="list-style-type: none"> a) Build a comprehensive service platform for R&D, incubation and promotion and application of low-carbon operation technologies, establish incentives and financing mechanisms for low carbon technology innovation and promotion and application, and promote the R&D and reserve of strategic low carbon core technologies for enterprises; b) Facilitate university-industry-research collaboration (UIC) with scientific institutions and higher education establishments to carry out research and advance low-carbon, zero-carbon and carbon-negative technologies within the park for relevant industries, and provide technical expertise and talent support to enterprises; c) Introduce low-carbon economy-related technical service enterprises to provide technical services needed for low carbon development for enterprises in the park

Table A.1—The illustration of the evaluation indicators (continued)

First-level indicators	Number	Second-level indicators	Unit	Illustration
Emission reduction performance	34	The completion of carbon emission reduction targets	—	Achievement of the park's emission reduction targets within the evaluation period
	35	The contribution of carbon emission output value per unit	ten thousand yuan/tCO ₂	The ratio of the total output value of the park to total greenhouse gas emissions. Calculation formula: The contribution of carbon emission output value per unit (ten thousand yuan/tCO ₂) = The total output value of the park (ten thousand yuan) / The total greenhouse gas emission (tCO ₂)

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