



Construction of Sustainable Management Evaluation Index System for Extra Large Power Grid Enterprises

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Abstract. To establish a sustainable management evaluation index system for large-scale power grid enterprises with "four dimensions, 15 first level indicators, and 48 second level indicators" for the evaluation system in dynamic evaluation and feedback, and transform it into an evaluation system suitable for provincial companies based on their functional positioning and business characteristics. Firstly, the construction ideas and principles of the evaluation system were clarified. Secondly, a company level sustainability management evaluation index system has been constructed and proposed. Thirdly, a sustainable management evaluation index system for provincial companies has been constructed and proposed.

Keywords: ESG, Extra Large Power Grid Enterprise, Index System, Sustainable Management.

1 Introduction

Sustainable development is a global topic of common concern and pursuit. From the sustainable development actions of the United Nations to the practices of various countries, sustainable development is constantly advancing globally^{[1][2]}. China has also accelerated the deployment and promotion of sustainable development as a major strategy. Large power grid enterprises undertake the basic mission of ensuring safe, economic, clean, and sustainable power supply, and play a major role in promoting sustainable economic and social development. However, facing the opportunities and challenges of sustainable development, as well as the complex and ever-changing external and internal situations, promoting sustainable management has become an inevitable choice and internal demand for actively adapting to changes in the situation and achieving high-quality development. Therefore, this article proposes an evaluation index system for sustainable management of large-scale power grid enterprises to guide relevant practices^[3].

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2 Construction ideas and principles of evaluation index system

2.1 Ideas

Following the forefront of international management, guided by the 17 Sustainable Development Goals of the United Nations, and closely aligned with the company's strategic goal of being an internationally leading energy internet enterprise with Chinese characteristics, and following the laws of sustainable development of the company, we will construct a relevant sustainability management evaluation index system to promote the in-depth development of the company's sustainability management and achieve coordinated development with the economy, society, and environment.

2.2 Principles

Three basic principles:

Firstly, the system is comprehensive. The evaluation indicators for sustainable development of a company should systematically and comprehensively reflect the company's own development and its economic, social, environmental, and other impacts.

The second is to highlight the key points. In the setting of specific indicators, it is necessary to focus on the long-term, and focus on selecting or proposing key indicators that can reflect the concept of sustainable development in enterprise development^{[4][5]}.

Thirdly, it is practical and feasible. Based on the United Nations Sustainable Development Indicators (SDGs), the selection of indicators is mainly based on reports or documents recognized by company leaders. At the same time, the difficulty of quantifying indicators and the availability of data should be considered, and main and comprehensive indicators should be selected as much as possible to ensure that information is available, calculations are feasible, and conclusions are credible^[6].

Three combinations:

One is the combination of process indicators and outcome indicators. Sustainable development is not only an end, but also a process. The evaluation indicators should not only have static indicators that reflect the results, but also dynamic indicators that reflect the process, such as the possibility of setting relevant growth rate indicators.

The second is the combination of qualitative and quantitative indicators. The sustainable development evaluation indicators of the company should be quantified as much as possible to quantitatively evaluate the development status. For some indicators that are difficult to quantify and of significant significance, qualitative indicators can be used to describe them.

The third is the combination of general indicators and characteristic indicators. The evaluation indicators should be based on the universal United Nations Sustainable Development Indicators (SDGs), combining characteristic indicators such as company strategic objectives, "world-class" demonstration enterprises, and company planning indicators.

3 Company level evaluation index system

3.1 Evaluation dimension

Based on the evaluation purpose, determine the evaluation dimension according to the following principles:

One is to guide the company's development to adhere to the "triple bottom line" and promote the coordinated development of the company with the economy, society, and environment. Sustainable development, as a global issue, requires enterprises to develop today without sacrificing tomorrow's development, and to adhere to the triple bottom line of economy, society, and environment. Therefore, the evaluation index system is first divided into three dimensions: economic benefits, social benefits, and environmental benefits brought by the company's development^[7].

The second is to guide companies to strengthen their emphasis on ESG (Environmental, Social, and Corporate Governance) and promote sustainable development from the perspective of corporate governance. Therefore, the evaluation index system for sustainable development management of the company not only considers economic, social, and environmental benefits, but also adds dimensions of corporate governance to guide the company to strengthen its emphasis on ESG and promote sustainable development.

Therefore, the sustainability management evaluation index system of the company is divided into four dimensions: economic benefits, social benefits, environmental benefits, and corporate governance benefits. Among them, the economic benefit dimension is mainly used to evaluate the effectiveness of sustainable development from the economic value brought by the company's development; The social benefit dimension is mainly used to evaluate the effectiveness of sustainable development in terms of the social value or impact brought by the company's development; The environmental benefit dimension is used to evaluate the effectiveness of sustainable development from the perspective of the environmental impact brought by the company's development; The dimension of corporate governance is mainly used to evaluate the effectiveness of sustainable development of enterprises from the perspective of corporate governance^[8].

3.2 Specific indicator settings

Under each evaluation dimension, guided by the United Nations SDGs, the specific settings of corresponding primary indicators and their subordinate secondary indicators are carried out, mainly referring to indicators such as company strategic goals, company development planning.

Firstly, the economic benefits dimension is divided into two primary indicators: business status and business potential. Among them, the economic benefits of sustainable management are mainly measured by indicators that reflect profitability, debt paying ability, and production efficiency. Three secondary indicators, including EBITDA profit before interest, tax, depreciation, and amortization, asset liability ratio, and employee labor productivity, are specifically selected; The business poten-

tial consists of two secondary indicators: net return on assets and growth rate of operating revenue.

Secondly, the social benefits dimension is divided into six primary indicators, including quality service, employee growth, social livelihood, government relations, business relations, and international influence. Among them, quality service includes five secondary indicators, including inter provincial and inter regional transmission capacity, customer scale, power quality, power supply reliability, and "access to electricity"; There are three secondary indicators for employee growth: employee career development, employee turnover rate, and equal employment; There are five secondary indicators for social and livelihood development, including East West assistance, employment promotion, external donations, poverty alleviation, and community relations; There are two secondary indicators for government relations, namely the completion of central decision-making and deployment, and serving local governments; The business relationship has four secondary indicators, including supply chain management, equipment sharing, anti unfair competition, and partner responsibility fulfillment; International influence includes three secondary indicators: international standard participation, international credit rating, and the Global Top 500 Most Valuable Brands.

Thirdly, the environmental benefits dimension is divided into four primary indicators: reducing emissions, promoting environmental friendliness, protecting biodiversity, and mitigating climate change. Among them, reducing emissions includes four secondary indicators: reducing gas emissions, reducing solid waste emissions, recycling and utilization rate of waste materials, and the proportion of investment in environmental protection facilities; Promote environmental friendliness by establishing three secondary indicators: environmental impact assessment coverage rate of planned projects, utilization rate of environmentally friendly equipment, and eco-friendly design and construction; The protection of biodiversity includes three secondary indicators: impact on forest area, impact on animal habitats, and impact on the number of biological species; There are three secondary indicators for mitigating climate change, including the consumption of clean energy to reduce emissions, the reduction of line loss to reduce emissions, and the reduction of electricity substitution emissions^[9].

Fourthly, the dimensions of corporate governance are divided into three primary indicators: governance capability, innovative development, and business development. Among them, governance capacity is specifically divided into three secondary indicators: compliance with business operations, risk management level, and modern corporate governance; There are two secondary indicators for innovation and development, including the intensity of research (R&D) funding investment and the status of major scientific and technological awards; Business development includes three secondary indicators: the development scale of emerging industries, the proportion of emerging industry revenue, and the proportion of international business profits.

As a result, a company level sustainable development management evaluation index system consisting of "four dimensions, 15 primary indicators, and 48 secondary indicators" has been formed, as shown in Table 1. The scoring of relevant qualitative indicators is provided by the expert panel.

Table 1. Corporate Level Index System

Serial Number	Dimension	Level 1 Indicators	Level 2 Indicators	Weight	
1	Economic Benefits	Performance	EBITDA	2.5%	
2			Leverage	2.5%	
3			Labor Productivity	2%	
4		Potential	ROE	2.5%	
5			Operating Revenue Growth Rate	2.5%	
6	Social Benefits	Service Quality	Cross Provincial and Regional Transmission Capacity	2%	
7			Scale of Customers	2%	
8			Electricity Quality	2%	
9			Power supply reliability	2%	
10			Access to Power	2%	
11		Career	Employee Career Development	2%	
12			Employee Turnover Rate	2%	
13			Employment Equality	2%	
14		Society	East-West Support	2%	
15			Employment	2%	
16			External Donations	2%	
17			Poverty Alleviation	2%	
18			Community Relation	2%	
19		Government Relation	Accomplishment of Central Committee Tasks	2%	
20			Local Government Service	2%	
21		Business Relation	Supply Chain Management	2%	
22			Facility Share	2%	
23			Anti Unfair Competition	2%	
24			Partnership	2%	
25		International Relation	International Standard Participation	2%	
26			International Credit Rating	2%	
27			Global Top 500 Most Valuable Brands	2%	
28		Environmental Benefits	Emission Reduction	Gas Emission Reduction	2%
29				Liquor Emission Reduction	2%
30				Solid Emission Reduction	2%
31				Eco-friendly Investment Ratio	2%
32				Environment Friendliness	Planning Projects Environmental Assessment Coverage
33	Eco-friendly Equipments Coverage		2%		
34	Eco-friendly Construction		2%		
35	Biodiversity		Forest Coverage	2%	
36			Animal Habitat	2%	
37			Bio Species	2%	

38		Climate Change	Clean Energy Consume	2%
39			Line Loss Reduction	2%
40			Electricity Substitution	2%
41	Corporation Governance	Governance Ability	Compliance	2%
42			Risk Management	2%
43			Modern Corporation Governance	2%
44		Innovation	R&D Intensity	2%
45			Important Science and Technology Prizes	2%
46		Business Promotion	Emerging Industry Scale	2%
47			Emerging Industry Revenue Ratio	2%
48			International Business Profit Ratio	2%

4 Evaluation Index System of Provincial Power Grid Company

Based on the characteristics of the transmission and distribution business of the provincial power grid company, and guided by the company level indicator system, this study aims to construct a sustainable management indicator system suitable for the provincial power grid company, in order to drive the company's power grid business to achieve high-quality sustainable development.

4.1 Transformation ideas

Under the guidance of the company level sustainability management evaluation indicator system, based on the functional positioning and business characteristics of the provincial power grid company, as well as the construction principles of sustainability management indicators, the specific indicators proposed in the company level indicator system are transformed into corresponding indicators for the provincial company, and the transformed indicators are further subdivided at the provincial company level to form the sustainability management evaluation indicator system for provincial power grid enterprises^[10].

The sustainability management evaluation indicators of the company are converted into evaluation indicators of the provincial power grid company, and there are three situations:

One is to directly include relevant indicators. For relevant indicators that not only meet the functional positioning and business characteristics of the provincial power grid company, but also meet the principles of sustainable management indicator setting, they will be directly included in the sustainable management evaluation indicator system of the provincial company. For example, 14 primary indicators such as "business status" and "business potential" are directly included, while 16 secondary indicators such as "EBITDA before interest, tax, depreciation, and amortization" and "asset liability ratio" are directly included.

The second is to further refine and decompose relevant indicators. Decompose and refine the indicators that meet the functional positioning and business characteristics of the provincial power grid company and can be further refined based on the actual

business situation of the provincial company into three-level indicators that can accurately reflect its core meaning, have strong comparability, highlight practicality, and have a significant guiding effect. Incorporate them into the sustainability management evaluation index system of the provincial company. For example, by quantifying indicators with poor comparability such as "power quality" and decomposing them into indicators such as "urban comprehensive voltage qualification rate" and "rural comprehensive voltage qualification rate"; Decompose indicators such as "obtaining electricity" into indicators with clear core meaning and prominent guiding role, such as "electricity processing link", "electricity processing time", "cost", "power supply reliability and transparency of electricity fee index".

Thirdly, relevant indicators are not included. For sustainability management evaluation indicators applicable to the company as a whole or other sectors, but not in line with the functional positioning and business characteristics of the provincial company, they will not be included in the sustainable management evaluation indicator system of the provincial company. For example, the primary indicator "International Relation" and its three secondary indicators, including "International Standard Participation", "International Credit Rating", and "Global Top 500 Most Valuable Brands", are not included in the provincial company evaluation system; Three secondary indicators, including "inter provincial and inter regional transmission capacity", "completion of central decision-making and deployment", and "proportion of international business profits", are not included.

4.2 Specific indicators

According to the above indicator transformation and setting ideas, the sustainability management evaluation index system of the provincial power grid company retains 14 first level indicators that are the same as the company level evaluation indicators in four dimensions: economic benefits, social benefits, environmental benefits, and corporate governance benefits, as the "International Relationship" in the first level indicators is removed; Due to the removal of six secondary indicators such as "International Standard Participation", "International Credit Rating", "Global Top 500 Most Valuable Brands", "Cross Provincial and Regional Transmission Capacity", "Accomplishment of Central Committee Tasks", and "International Business Profit Ratio", 42 secondary indicators that are the same as company level evaluation indicators are retained in Table 2.

Table 2. Province Level Index System

Serial Number	Dimension	Level 1 Indicators	Level 2 Indicators	Level 3 Indicators
1	Economic Benefits	Performance	EBITDA	
2			Leverage	
3			Labor Productivity	
4		Potential	ROE	
5			Operating Revenue Growth Rate	

6	Social Benefits	Service Quality	Scale of Customers		
7			Electricity Quality	Urban Comprehensive Voltage Qualification Rate	
8				Rural Comprehensive Voltage Qualification Rate	
9			Power supply reliability	Average Power Outage Time for Urban Users	
10				Average Power Outage Time for Rural Users	
11			Access to Power	Access Procedure	
12				Access Time	
13				Access Fee	
14				Power Reliability and Cost Transparency	
15			Career	Employee Career Development	Professional Passage
16					Trained Rate
17				Employee Turnover Rate	
18				Employment Equality	Female Staff Rate
19					Female Manager Rate
20		Minority Rate			
21		Competition for Positions Ratio			
22		Society	East-West Support	East-West Support Investment	
23				East-West Support Staff	
24			Employment	Fresh Graduates Recruited	
25				Veterans Recruited	
26				Disabled Recruited	
27			External Donations	Donation Fund	
28				Donation Times	
29			Poverty Alleviation	Fund for Poverty Alleviation	
30				Poverty Alleviation Programs	
31				Access for Population Unpowered	
32			Community Relation	Community Funded	
33				Community Programs Funded	
34				Schools Funded	
35				Students Funded	
36		Rural Grid Investment			
37			Legal Cases		
38		Government Relation	Local Government Service	Integration of Grid Development and Local Planning	
40				Response to Local Policies	
41				Local Policies Involvement	
42		Business Relation	Supply Chain Management	Qualified Suppliers	
43				Supplier Reverse Rating	
44				Blacklisted Suppliers	
45				Application of Modern Smart Supply Chain Scenarios	
46			Facility Share	Sharing Device Firms	
47		Sharing Device Quantity			

48				Device Sharing Rate			
49				Device Sharing Mechanism			
50				Anti Unfair Competition	Code of Conduct for Fair Competition of Suppliers		
51					Connected Transaction		
52					Improper Disclosure of Commercial Information to Suppliers		
53					Code of Conduct Against Commercial Bribery		
54					Commercial Bribery Cases		
55				Partnership	Disclosure of Electricity Trading Information		
56					Completion of Goods Contract		
57					Completion of Service Contract		
58				Environmental Benefits	Emission Reduction	Gas Emission Reduction	Recovery of SF ₆
59							Reduction of SO ₂ Emissions
60							Reduction of NO _x Emissions
61						Liquor Emission Reduction	Disposal of Mineral Oil
62	Recycling of Transformer Oil						
63	Solid Emission Reduction	Disposal of Waste Lead-acid Batteries					
64		Disposal of Insulators					
65		Disposal of Cable Cover Plates					
66		Disposal of Cement Poles					
67		Recycling of Waste					
68	Eco-friendly Investment Ratio						
69	Environment Friendliness	Planning Projects Environmental Assessment Coverage					
70			Eco-friendly Equipments Coverage				
71			Eco-friendly Construction				
72	Biodiversity	Forest Coverage	Trees Planted				
73			Forest Decreased				
74		Animal Habitat	Impacted Critical Habitats				
75			Preserved Critical Habitats				
76		Bio Species	Increased Species				
77	Reduced Species						
78	Climate Change	Clean Energy Consume					
79		Line Loss Reduction					
80		Electricity Substitution					
81	Corporation Governance	Governance Ability	Compliance	Law and Regulation Defiance			
82				Fines Amount			
83				Regulator Reward			
84				Policy Defiance			
85		Risk Management	Risk Control System Construction				
86			Risk Control Level				
87		Modern Corporation Governance	Completeness of Modern Corporate Governance				

88				Performance of Modern Corporate Governance		
89				Adaptability of Group Control		
90				Innovation	R&D Intensity	
91					Important Science and Technology Prizes	
92					Business Promotion	Emerging Industry Scale
93						Comprehensive Energy Service Scale
94				Emerging Industry Revenue Ratio		EV Service Revenue Ratio
95						Comprehensive Energy Service Revenue Ratio

5 Conclusion

To establish a sustainable management evaluation index system for large-scale power grid enterprises with "four dimensions, 15 first level indicators, and 48 second level indicators" for the evaluation system in dynamic evaluation and feedback, and transform it into an evaluation system suitable for provincial companies based on their functional positioning and business characteristics. Firstly, the construction ideas and principles of the evaluation system were clarified. Secondly, a company level sustainability management evaluation index system has been constructed and proposed. Thirdly, a sustainable management evaluation index system for provincial companies has been constructed and proposed.

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