

# Research on the Method of Power Grid Strategic Planning in Complex Environment

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## ABSTRACT

Currently, the economy has entered a stage of high-quality development. With the integration of energy revolution and technological revolution, the internal and external environments faced by power grid companies have become increasingly complex. Based on the related theories of strategic management, this paper constructs a planning closed-loop management method system suitable for power grid enterprises. The research conclusions have important guiding significance for power grid companies to carry out the 14th Five-Year Plan

**Keywords:** *Power Grid, Complex Environment, Strategic Planning*

## 1. INTRODUCTION

At present, the development environment faced by power grid companies is becoming increasingly complex and changeable, which puts forward higher requirements for the scientific, systematic and accurate development planning of power grid companies. In order to actively adapt to the complex dynamic environment, grid companies should form a set of effective planning methods. This is conducive to the power grid companies to accurately determine the impact of the internal and external environment, and then adjust their plans in a timely manner according to environmental changes.

The strategic planning of power grid enterprises refers to a series of processes in which enterprises formulate and implement plans based on the external environment and their own conditions. Under its own development strategy, the planning work of power grid companies should include planning preparation, planning implementation, planning performance evaluation, and planning optimization adjustments, which forming a complete closed-loop management.

First of all, the focus of grid companies in the formulation of strategic planning is to carry out environmental analysis, identify key environmental factors, and determine the degree of related impact with planning goals. At the same time, it is necessary to scientifically formulate planning goals, prepare corresponding special plans, and carry out investment benefit forecast analysis. Secondly, the focus of the planning implementation and performance evaluation is to evaluate the planning implementation effect. Third, the focus of the planning rolling optimization and adjustment is to carry out planning rolling adjustments in a timely and scientific manner based

on the evaluation of the adaptability of the grid enterprise planning environment. When the environment changes, a rolling mechanism should also be established to dynamically adjust the power grid enterprise planning to adapt to the new environmental requirements.

Aiming at the particularity of the electric power industry, this paper constructs a whole set of grid enterprise planning method framework, and proposes the whole link method of planning preparation, execution and rolling adjustment. From the perspective of the whole process, the conclusions of this paper can provide systematic guidance for planning of power grid enterprises.

## 2. PLANNING METHOD OF POWER GRID ENTERPRISE

### 2.1. Planning stage

#### 2.1.1. Environment Analysis Method

The strategic planning environment includes the external environment and the internal environment. The external environment breeds opportunities and challenges for the development of power grid enterprises. Internal resources and capabilities are an important cornerstone for grid companies to seize strategic opportunities. The first step is to evaluate the external environment related to the strategic positioning and business structure characteristics of the grid company. The second step is to evaluate the internal environment such as power grid enterprise capabilities and resources. The last step is to

comprehensively evaluate and analyze the overall environment of power grid enterprises by integrating internal and external environment.

**2.1.2. Planning goal decomposition method**

Planning goal decomposition is a complex system engineering. Therefore, this article uses a step-by-step method to achieve a balanced decomposition of the strategy and planning index system.

First of all, the decomposition of planning objectives should achieve the internal balance optimization of the development indicators. Regarding the input-type indicators and output-type indicators in the planning target system, the two types of indicators need to be decomposed in different dimensions. Therefore, the two types of development indicators need to adopt different methods to achieve balance within the indicators. For input indicators, the goal decomposition needs to achieve a balance of time, professional departments, and provincial grid companies. The deviation balance method based on benefit evaluation indicators is adopted to achieve a balance among provincial power grid enterprises. Use the same method to achieve a balance between professions. The rebalancing method based on optimization theory is adopted to realize the balance of development indicators in the dimensions of provincial power grid enterprises and professional departments. For output indicators, it is necessary to achieve a balance between time and the dimensions of provincial power grid enterprises. The deviation balance method based on the benefit evaluation index is adopted to realize the balance among the provincial power grid enterprises. A balance method based on

balancing criteria is used to achieve a comprehensive balance between indicators.

**2.2. Execution phase**

The evaluation of the implementation of the grid enterprise planning is carried out from the implementation progress and implementation quality, as shown in table 1. First of all, it is to evaluate the implementation of specific goals planned by power grid companies. Each specific target is evaluated from the planning implementation progress and implementation quality. Among them, the execution quality of the target is subdivided into execution deviation, execution fluctuation and schedule deviation.

Second, it is to evaluate the implementation of key tasks planned by power grid companies. It mainly includes evaluation of power grid construction, safe production, enterprise management, technological innovation, and soft power construction. Each aspect of the evaluation includes progress evaluation and quality evaluation. It is mainly a qualitative evaluation, which is evaluated by experts based on strategies and planning implementation periods.

Third, the evaluation of the function planning of power grid enterprises is also divided into the evaluation of the implementation of objectives and the evaluation of the implementation of key tasks.

Finally, the weighted average of the above three evaluation results. The evaluation results of the implementation progress and implementation quality of the grid enterprise plan will be obtained.

**Table 1 The content of the evaluation of the implementation of the grid enterprise planning**

	<b>Implementation Progress</b>	<b>Implementation Quality</b>
<b>Specific Target</b>	<ul style="list-style-type: none"> <li>● Evaluate the progress of the implementation of each goal</li> <li>● Based on the evaluation of each goal, calculate the implementation progress of the overall goal of the grid enterprise.</li> </ul>	<ul style="list-style-type: none"> <li>● Evaluate the execution quality of each target</li> <li>● Based on the evaluation results of a single target, calculate the overall execution quality of the grid enterprise's strategic planning.</li> </ul>
<b>Key Task</b>	<ul style="list-style-type: none"> <li>● Evaluate the implementation progress of each key task of the strategic plan;</li> <li>● Based on the key tasks of each plan, comprehensively calculate the execution progress of the key tasks of the strategic plan.</li> </ul>	<ul style="list-style-type: none"> <li>● Evaluate the execution quality of each key task;</li> <li>● Based on the evaluation result of a single key task, comprehensively calculate the execution quality of the key task.</li> </ul>
<b>Function Planning</b>	<ul style="list-style-type: none"> <li>● The evaluation method is the same as that of the general plan of the power grid enterprise. It is divided into evaluation of the implementation of functional planning objectives and evaluation of the implementation of key tasks of functional planning.</li> </ul>	

<b>Overview</b>	<ul style="list-style-type: none"> <li>Evaluate the overall implementation progress of the grid enterprise's strategic planning based on specific goals and implementation progress of key tasks.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate the overall implementation quality of the grid enterprise's strategic planning based on specific goals and implementation progress of key tasks.</li> </ul>
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### 2.3 Rolling adjustment stage

The adjustment of the grid enterprise planning can be done by SWOT analysis. The SWOT analysis method arranges the internal advantages, disadvantages and external opportunities and threats of a company in a matrix form. Then, with the idea of system analysis, it matches various factors with each other to help organizations find and formulate business strategies and tactics that suit their actual conditions.

First of all, it is to construct a grid enterprise planning environment analysis table. According to the results of internal and external environmental analysis, the environmental factors of power grid enterprise planning are classified. Changes in the external environment are divided into opportunities and challenges, and changes in the internal environment are divided into advantages and disadvantages.

Secondly, the SWOT matrix is constructed. Sort the various factors obtained from the analysis according to the degree of influence [1]. The SWOT matrix is structured. In this process, important influencing factors are ranked first, and those secondary influencing factors are ranked behind. Then, the identified key strengths and weaknesses are divided into two groups. One group relates to potential opportunities in the industry. The other group is related to potential threats. Thus, four alternative strategies are formed, namely SO, ST, WO, and WT strategies. SO strategy, namely advantage-opportunity strategy, is a growth strategy that takes advantage of the company's internal advantages and takes advantage of the company's external opportunities [2]. WO strategy, or weakness-opportunity strategy, is a reversal strategy that aims to make up for internal weaknesses by using external opportunities. ST strategy, namely advantage-threat strategy, is a

diversified strategy that uses the advantages of the company to avoid or reduce the impact of external threats. The WT strategy, or the weakness-threat strategy, is a defensive strategy designed to reduce internal weaknesses while avoiding external environmental threats.

Finally, it is necessary to evaluate each environment in the SWOT matrix and choose an appropriate strategy. Based on the classification of the internal and external environments in the four quadrants in Table 2, the opportunities, challenges, advantages, and disadvantages of each quadrant are evaluated separately [3]. According to the evaluation results, when the opportunities outweigh the challenges and the advantages outweigh the disadvantages, the power grid enterprise planning adjustment should choose a growth adjustment strategy, give full play to the advantages, use the opportunities, and achieve sustained growth. When the opportunities outweigh the challenges and the advantages are less than the disadvantages, the power grid enterprises should choose a reversing strategy and add some resources to promote the transformation of internal resource disadvantages to advantages, so as to cater to or suit external opportunities [4]. When the opportunities are less than the challenges and the advantages outweigh the disadvantages, grid companies should choose multiple strategies for planning and adjustment to overcome external threats and make full use of their advantages. When opportunities are less than challenges and advantages are less than disadvantages, grid companies should choose defensive strategies for planning adjustments to reduce internal disadvantages, avoid external threats, and ensure that they survive the crisis before seeking growth opportunities [5].

**Table 2 Strategy Set based on SWOT Matrix**

	<b>S</b>	<b>W</b>
<b>O</b>	SO ( Growth strategy ) Take advantage of opportunities	WO ( Twisting strategy ) Take advantage of opportunities to make up for weaknesses
<b>T</b>	ST ( Multiple strategies ) Use advantages to mitigate threats	WT ( Defensive strategy ) Reduce weakness and avoid threats

### 3. CONCLUSION

Power grid companies have multiple attributes, such as state-owned companies, infrastructure companies, energy and power companies, capital and technology-intensive companies. This is an important feature that distinguishes power grid companies from other companies. Therefore, power grid companies must combine their own development reality and formulate development plans with their own characteristics.

This paper constructs a closed-loop management method system suitable for grid enterprise planning. The main conclusions are as following. First, in the process of planning, implementation, and rolling, key factors should be grasped for in-depth analysis. This can not only improve the scientificity of planning management, but also improve the efficiency of planning management. Second, the planning of power grid enterprises should improve the mechanism of implementation tracking and monitoring to ensure effective implementation.

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