



# Research on Ecosystem Strategy of Provincial Power Grid Company

Meng Yang<sup>1</sup>, XiChao Du<sup>1</sup>, YongJun Yang<sup>1</sup>, PengPeng Yang<sup>2</sup>(✉), XianJie Wu<sup>2</sup>,  
and YiXue Yang<sup>2</sup>

<sup>1</sup> State Grid Henan Electric Power Company Economic and Technical Research Institute,  
Zhongzhou, China

<sup>2</sup> Xi'an International Studies University, Xi'an, China  
xjtu2004@126.com

**Abstract.** Take Electric Power of HeNan as an example, based on symbiosis theory and ecosystem theory, constructing the connotation and form of the ecological system of the provincial power grid company, and explore the evolution mechanism of the ecosystem of provincial power grid companies, and give the development strategy of the ecosystem of the provincial power grid company. Provincial power grid companies need to accurately define the symbiosis unit, symbiosis model, and symbiosis environment in the ecosystem with the enterprise as the core, continue to absorb new technologies, expand the ecosystem, and gradually improve a scientific and sound provincial power grid ecosystem.

**Keywords:** ecosystem · symbiosis theory · symbiosis unit · symbiosis environment · symbiosis model

## 1 Introduction

Provincial power grid companies use the power grid as a carrier to play a role of “bridge” and “link” in connecting the upstream and downstream of the industrial chain and supply chain, and have the conditions to build a benign ecosystem for other members. By building a provincial power grid company ecosystem, Grid companies can dynamically adapt to the increasingly fierce market competition environment, achieve symbiotic and coordinated development with stakeholders, and then create new competitive advantages. Based on this, studying the ecosystem strategy of provincial power grid companies in the context of digital economy has strong theoretical and practical significance for provincial companies to break through the current development dilemma.

Ecosystems were first seen in the field of biology. In 1993, Moore introduced the concept of ecology to the field of management for the first time. Jin Yanming, Liu Jun [1] others took State Grid as an example to study the connotation of the natural monopoly enterprise ecosystem, and based on the existing problems of the power grid enterprise ecology, put forward the key points of the future State Grid Corporation's ecosystem construction and maintenance. He Dachun and Xu Jianjun [2] used State Grid Jiangsu Electric Power Co., Ltd. as an example to build a provincial-level power grid innovation

ecosystem based on an excellent performance model. Yu Hao and Jiang Yujia et al. [3] introduced the ecological concept into the strategy of power grid companies, constructed a corporate ecosystem formed by power grid companies, various stakeholders, and the external living environment, and discussed the ecology of power grid companies from the new situation facing the ecosystem. The strategic direction of system construction. Ma Li, Zhang Xiaofeng, etc. [4] took power companies in energy companies as an example, proposed an external environment analysis framework based on the core content of the ecosystem in which the companies are developing, and designed a quantitative assessment basis for the degree of planning environmental adaptation.

The possible innovation of this article is that most of the existing researches are limited to a simple list of the driving factors of the ecosystem, and fail to fully reveal how the core enterprise-centered ecosystem is dynamically evolving. From the perspective of symbiosis, this article reveals that the core enterprise is How to dynamically evolve from point symbiosis to line symbiosis and then to network symbiosis. Most of the existing ecosystem strategy researches are based on the Internet industry. This article attempts to start from the provincial power grid companies to provide a useful reference for the construction of traditional corporate ecosystems such as electric power.

## 2 Materials and Methods

### 2.1 Research Design

**Research method:** This article mainly adopts the single-case analysis method, selecting Henan Electric Power Company as the case enterprise, and the reasons for selecting the single-case enterprise are: ① The case study can facilitate the discussion from the time dimension of enterprise development, and can fully reveal the evolution of the ecosystem of the provincial power grid company. ②As the current ecosystem theory system is immature and crosses with many other theories, case studies can better clarify the connotation of the ecosystem. ③Different types of enterprise ecosystems are very different. From a single case study, you can better focus on a certain type of enterprise, so as to discuss how to build this type of enterprise ecosystem, so it has a strong pertinence.

**Sample selection:** This article selects Henan Power Grid Company as the research object of the provincial power grid company's ecosystem strategy, for the following reasons: (1) Henan Power Grid Company, as an important executive body of the State Grid, shoulders the mission of effectively undertaking the development strategy of the State Grid. Therefore, the study of Henan Power Company's ecosystem strategy has strong practical significance. (2) Henan Power Grid Company, as a power supplier in Henan Province, has established extensive connections with the upstream and downstream of the industrial chain. Therefore, it has all the conditions for building an ecosystem and is typical and representative of samples.

**Data collection:** This paper adopts the method of triangulation verification to ensure the reliability and validity of the research. First, use the literature research method to sort out the relevant literature of Henan Power Grid Corporation. Secondly, obtain a large amount of second-hand information from the company's official website and public media reports. Finally, get in touch with the relevant person in charge of Henan Power

Grid Company, and obtain first-hand information of the company through interviews to ensure the authenticity and reliability of this research.

## 2.2 Case Study

### 2.2.1 The Ecosystem Connotation of Henan Power Grid Corporation

The core enterprise Henan Power Grid Corporation proposes a common value proposition, and then collaborates with other members of the ecosystem to realize the process of value co-creation, value sharing, value distribution and value sharing. In the ecosystem with Henan Power Grid Company as the core, there are communities composed of multiple symbiotic units. According to the characteristics and functions of the members in the ecosystem, this article summarizes them into the following communities. The first is the top-level community with the central government and the Henan provincial government as the main body. The top-level community is responsible for exerting influence on the core enterprises from the macro level, providing strategic planning guidance for the core enterprises, and ensuring the correct evolution direction of the entire system. The second is an industry cluster dominated by suppliers and competitors. The industry cluster is the main body to realize value co-creation and the core community to maintain the stability of the ecosystem. The third is the demand community with users as the main body. The response of this kind of community determines the survival of the ecosystem, and is also the decision community for realizing the value proposition to value co-creation. Finally, there are related auxiliary communities that ensure the normal operation of the main community, including scientific research institutions, social organizations, media, strategic partners and other auxiliary communities (Fig. 1).

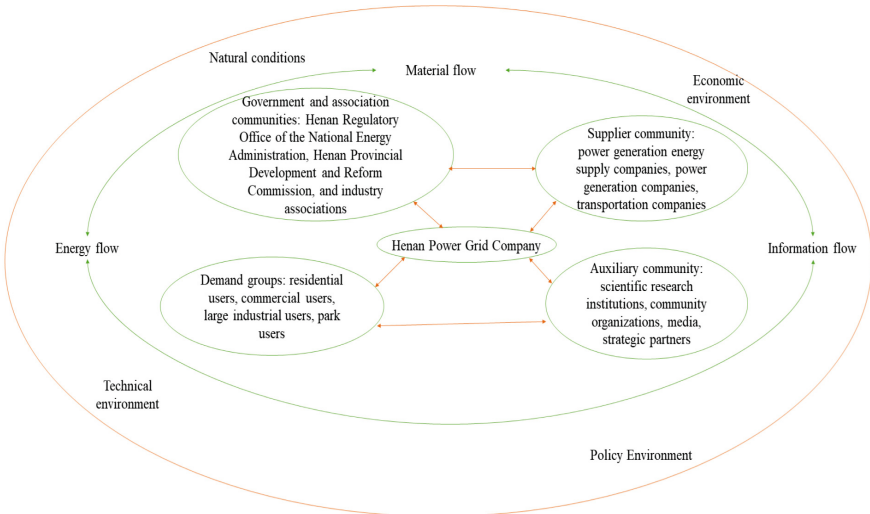


Fig. 1. Ecosystem form of Henan Power Grid Corporation

## 2.2.2 Ecosystem Form of Henan Power Grid Corporation

### (1) Case company introduction

State Grid Henan Electric Power Company is a wholly-owned subsidiary of State Grid Co., Ltd., a state-owned super large-scale enterprise, shouldering the important task of providing reliable power guarantee for the economic and social development of Henan Province and the province's more than 41 million power customers. Under the dual-carbon background, the State Grid proposed to closely follow the company's "one body and four wings" development layout, actively serve the carbon peak and carbon neutral goals, promote the construction of a new power system with new energy as the main body, and build the State Grid Corporation into An international leading energy Internet company with Chinese characteristics. Henan Electric Power Company needs to solve its own development problems while undertaking the State Grid strategy in an all-round way, so as to realize the company's high-quality development.

### (2) Ecosystem form of Henan Power Grid Corporation

The ecosystem of Henan Power Grid Corporation is based on the theoretical foundation of natural ecosystems. There will also be stages of start-up, expansion, and maturity of the ecosystem, and it will show three different types of symbiosis: point symbiosis, line symbiosis, and integrated symbiosis. Symbiosis.

The initial stage of the ecosystem (point symbiosis stage: 1993 to 2011)

As the core enterprise Henan Power Grid Company is just in the early stage of system reform, it lacks an overall ecosystem concept and a clear value proposition, internal system members and resource types are limited and scattered, and power grid companies, power supply companies, and consumers are still in a state of mutual adaptation and adjustment. At this time, the ecosystem presents a point symbiosis form.

Ecosystem expansion stage (line symbiosis stage: 2011 to 2020)

At this stage, the system value proposition advocated by core enterprises has gradually become clear and has achieved market success in a short period of time. This has largely attracted many heterogeneous system participants to contribute their resources, knowledge, technology, and information. Ensure the continuous expansion of the market for innovative products (services). At this stage, although the level of value co-creation has increased significantly, because of the relatively high level of technology and market risks at this stage, value sharing, value distribution, and value sharing are not the focus of the ecosystem, so the value process is at a relatively low level.

Ecosystem expansion stage (integrated symbiosis stage from 2020 to present)

With the introduction of the dual-carbon goal, Henan Power Grid Corporation began to accelerate the development of the power grid, give full play to the role of the grid connecting energy production and consumption platform hub, and promote the digital transformation of the power grid. State Grid Henan has built a provincial-level energy big data development ecosystem, integrating coal, electricity, oil, gas and other energy data with government and important customer data, building a provincial-level energy big data development ecosystem, and supporting energy production in Henan Province And consumer revolution. At this stage, the ecosystem value proposition has stabilized and is recognized by all members of the system. The ecosystem dominated by core companies has begun a virtuous circle. The entire ecosystem has coordinated to achieve value co-creation, value sharing, value distribution, and value co-creation. In the process

of value realization, core enterprises have gradually strengthened their strategic control over the ecosystem.

### **3 Results and Discussion**

Based on the theory of ecosystem and symbiosis, this paper conducts an in-depth case analysis of the various stages of the development of Henan Power Grid Company from the perspective of symbiosis evolution, and finds that the ecosystem of Henan Power Grid Company evolves along the form of point symbiosis, line symbiosis and then integrated symbiosis. And the evolution of the ecosystem is driven by the dual mechanism of interest-based incentive mechanism and trust-based coordination mechanism. From the perspective of symbiosis, this research dynamically presents the ecosystem development form of provincial power grid companies. To a certain extent, it is a supplement to the theoretical insufficiency of the previous research on power grid companies. At the same time, it tries to open the black box of the evolution mechanism of the ecosystem from the incentive mechanism and coordination mechanism. However, due to the current unclear definition of the ecological system, the corresponding database has not been established. Therefore, this study adopts case analysis, and it is difficult to accurately measure the impact of the two mechanisms. At the same time, the limitation of this article is that there is no basis for the division of ecosystem development stages, so there may be certain deviations.

### **4 Conclusions**

#### **4.1 The Provincial Power Grid Company Should Continue to Consolidate the Status of the Core Species in the Provincial Power Grid Ecosystem**

Strengthen the construction of the professional capacity of the provincial power grid company, improve the ability of corporate governance, continue to optimize the structure of the corporate management team, improve the corporate decision-making management system, and establish an internal control system for production and operation. Strengthen and improve technical equipment, improve the professional capabilities of key personnel, and thereby enhance the business carrying capacity of the provincial power grid company. The provincial power grid company should improve the workload plan management and improve the efficiency of the enterprise's internal work.

#### **4.2 Provincial Grid Companies Should Continuously Optimize the Symbiosis Unit**

Establish a resource sharing mechanism between members in the ecosystem to achieve common development among members. The symbiosis unit related to power generation should promote the efficient use of energy and optimize the power supply structure. Power supply-related symbiosis units should continue to increase the proportion of clean energy in energy supply, build a safer grid structure, and improve the level of automation and intelligence. Power-related symbiosis units should use the digital grid platform to

realize the comprehensive sharing of power data and improve user satisfaction. The energy regulatory authority should actively respond to the new energy security strategy under the “14th Five-Year Plan”, increase the rate of clean energy.

The provincial power grid company should actively expand the breadth of the ecosystem and promote the integration of resources of the provincial power grid ecosystem.

In the context of digitization, the provincial power grid company should continue to innovate in the field of power informatization, improve the level of power grid operation and management, and establish external data sharing, which can collect and share data in real time, and respond to the needs of customers, government departments, and power generation terminals. Accelerate the construction of the energy Internet and promote the sharing of information among symbiotic units in the provincial grid ecosystem. Accelerate the construction of smart grids.

**Acknowledgments.** Deepening Research on the Landing Practice of State Grid’s Strategic Provincial Companies.

## References

1. Jin Yanming, Liu Jun, Bai Jianhua, Xin Songxu. Research on the Ecosystem of Natural Monopoly Enterprises—Taking the State Grid Corporation of China as an example [J]. *Chinese and Foreign Entrepreneurs*, 2015(34): 112-114.
2. He Dachun, Xu Jianjun, Wu Xiwei. The construction of the innovation ecosystem of provincial power grid enterprises [J]. *China Electric Power Enterprise Management*, 2018(35): 6-8.
3. Yu Hao, Jiang Yujia, Chen Ruixin. Application of Ecosystem Concept in Grid Enterprise Strategy [J]. *China Electric Power Enterprise Management*, 2019(03): 40-41.
4. Ma Li, Zhang Xiaofeng, Song Haixu, Jiao Qing. Environmental Adaptability Analysis of Energy Enterprise Planning—Taking Power Grid Enterprise as an Example [J]. *Journal of China University of Petroleum (Social Science Edition)*, 2020, 36(04): 17–22.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter’s Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter’s Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

