

# Research on Financial Model Innovation Based on Typical Application Scenarios of Energy Internet

Dan Wang<sup>a,\*</sup>, Wenhao Zhu<sup>b</sup>, Yan Chang<sup>c</sup>, Shan Jiang<sup>d</sup>

<sup>a</sup> State Grid Energy Research Institute, CHINA; wangdan@sgeri.sgcc.com.cn

<sup>b</sup> State Grid Energy Research Institute, CHINA; emily\_chang@126.com

<sup>c</sup> State Grid Energy Research Institute, CHINA; Cdream46@163.com

<sup>d</sup> North China Electric Power University, CHINA; khoisme@163.com

\*Corresponding author

## ABSTRACT

As the main development direction of the energy industry in the future, the energy Internet has emerged a large number of new business forms. The deep integration of energy Internet industry ecology puts forward new requirements for energy Internet finance. Based on the typical application scenarios of energy Internet, such as comprehensive energy service, industry chain finance, smart car networking, and new retail of energy finance, this article makes an in-depth analysis of the characteristics and capital requirements of each business scenario, and builds a financial innovation model adapted to the development of each business scenario on this basis.

**Keywords:** Energy Internet, Business Scenario, Financial Service Mode

## 1. INTRODUCTION

In recent years, the development of innovative technologies such as new energy technology, cloud computing, big data, mobile communication and artificial intelligence has continuously promoted the transformation and upgrading of the energy and power industry. New forms of business have emerged in the energy industry, such as comprehensive energy services, industry chain finance, smart car networking, and new retail of energy finance. This puts forward new requirements for the innovation of energy Internet finance model [1].

## 2. ANALYSIS OF DEMAND OF INNOVATION AND DEVELOPMENT OF ENERGY INTERNET FINANCE

### 2.1 Definition of energy Internet finance

"Energy Internet Finance" is a financial ecological mode deeply integrated with the ecological development of the energy Internet industry. The energy Internet financial services in the energy industry ecosystem, the Internet via the Internet, cloud computing, artificial intelligence, big data, chain blocks, such as Internet information technology implementation of cash flow, information flow, energy flow and customer flow, the

industrial ecosystem formed between multiple subject to financing, payment, investment, consumption and information intermediary for the integration of new financial business model.

Energy Internet finance and energy Internet industry ecology are deeply integrated, forming a clear three-tier structure. The energy Internet industry ecosystem is located at the bottom, which is the basic layer of the energy Internet innovation framework and solves the demand problems in the energy Internet financial innovation framework [2]. The information system formed by big data, Internet and other information technologies is located in the middle layer, linking finance and industry, and solving the credit problem in the innovation framework of energy Internet finance. Financial services are located at the top. Through interconnected information flow, capital flow and logistics, diversified and targeted financial services are provided for the subjects in the energy Internet industry ecosystem at the base layer, so as to solve the financial model problems in the energy Internet finance innovation framework (Figure 1).

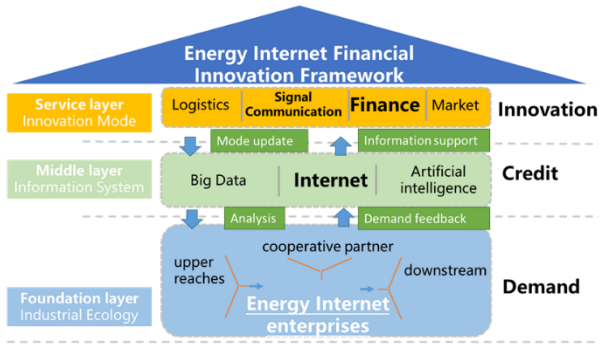


Figure 1 Energy Internet Financial Innovation Framework

## 2.2 Analysis of necessity energy Internet finance innovation

The traditional single financial service cannot support the industry chain ecosystem, so it is necessary to enhance the financial service ability through innovative financial models to provide a good industrial environment for the energy Internet ecosystem [3]. The development of energy Internet and its emerging businesses need a large amount of financial support, and the demand mode and demand degree of different forms of business under the energy Internet show diversified characteristics. Therefore, it is necessary to continuously innovate financial models that match business models, use emerging technologies to accurately identify business needs and deeply embed the whole process of business [4].

## 3. FINANCIAL MODEL INNOVATION OF INTEGRATED ENERGY SERVICE

### 3.1 Integrated energy service business model

The integrated energy system is an integrated energy production, supply and marketing system formed after organically coordinating and optimizing the production, transmission, distribution, conversion, storage and consumption of various energy forms such as oil, natural gas, solar energy, wind energy, electric power, cold and hot energy. At present, State Grid Corporation has set up a comprehensive energy service platform. On the one hand, it opens its platform to external enterprises, including partners, alliances, start-ups and even consumers, to build core competitiveness together with other market partners. On the other hand, it provides supply and demand matching, payment, logistics and other related services, and combines and packages different products and services to provide more value-added services and more complete customer experience.

### 3.2 Financial Model Innovation

**In the construction link:** For the upstream and downstream enterprises of the energy industry chain, it

provides platform financial services by assessing the credit investigation, operation status and debt paying ability of the enterprises, and provides a docking channel for the industry and capital. **The first is financial leasing.** Conduct investment income analysis for corporate customers, and provide equipment leasing, equipment staging, investment income sharing and other financial services as needed. **The second is supply chain finance.** By assessing the credit situation of enterprises, the upstream and downstream enterprises in the supply chain that meet the requirements of risk control are given risk endorsement to help financial institutions provide financing services for rapidly developing small and medium-sized enterprises.

**In operations: The first is the financial embedded electric energy service.** As a strategic investor, invest in the construction of distributed power stations; Finance is embedded in gas supply services, buying stakes in gas companies and taking charge of electricity and heat supply [5]. **The second is to provide targeted financial services.** Taking advantage of its advantages, it provides targeted services such as planning, design and consulting for the project, and provides users with safe and efficient computing and data processing capabilities as well as related derivative services, and charges related fees.

## 4. MODE INNOVATION OF INDUSTRY CHAIN FINANCE

### 4.1 Industrial chain financial services business

At present, the company's industry chain financial business mainly falls into two categories: one is the power purchase and sale relationship between upstream power generation enterprises and downstream electricity customers based on the "production-supply and sale" of power; The other is the purchase and sale relationship with upstream equipment manufacturing enterprises based on power grid construction, operation and maintenance, and the relationship between Party A and Party B formed with power construction enterprises. These two types of purchase-sales relationships can be divided

into four types according to the different service objects: the needs from the units in the system, the upstream suppliers (such as Power equipment suppliers), the downstream enterprise customers and the individual customers.

### 4.2 Financial innovation

For the four types of customers, financial products that can be deeply embedded include **financing products, insurance protection products and asset management products.** With the advancement of innovation of financial institutions and the improvement

of relevant laws, financial products keep pace with The Times and will develop in three directions in the future.

**The first is Pool financing products.** Collateral assets provided by clients are allowed to enter and exit the pool, and financial institutions only control the value balance of the "pool", and issue credit according to it, including dynamic pledge credit of movable property, accounts receivable pool financing, bill pool financing, etc.

**The second is Composite products.** In order to simplify the operation process of the financial business of the industry chain and link up the capital needs of procurement, inventory and settlement, financial institutions can also implement the combination of financing products of the industry chain to further meet the personalized financing needs of customers through "one application and one approval". Typical product combinations are as Table 1.

**The third is Financial products online.** By relying on electronic online transaction information and commercial credit records, financial units can provide upstream and downstream enterprises with a complete set of comprehensive financial services including online industrial chain member management and industrial chain financing services through electronic channels. In the financing process of electronic industrial chain, financial institutions can better track the capital flow, information flow and logistics of customers in the industrial chain. At the same time, P2P has become an important source of capital for industry chain finance.

## **5. FINANCIAL MODEL INNOVATION OF SMART VEHICLE NETWORK**

### **5.1 Smart Internet of Vehicles business model**

The company is building a smart vehicles networking platform, relying on the State Grid Electric Vehicle Company, to provide charging service network construction, operation and maintenance, customer service and related technical innovation. The core foundation for the development of the company's smart car network is the layout of charging piles to accelerate the construction of high-quality incremental charging piles layout. **First**, for the incremental charging pile market, continue to promote the construction of intercity fast charging stations, and strive to achieve full coverage of national expressway and provincial expressway service areas. **Second**, seize the private charging pile market, around the demand of private users "one car, one pile", give play to the professional advantages of the company, accelerate the improvement of the company's

construction coverage of incremental private charging piles. **Third**, speed up the construction of special and public charging piles for public vehicles such as high-quality buses and taxis, and public charging stations such as transportation hubs such as high-speed rail stations and important scenic spots.

### **5.2 Financial innovation**

**With corporate finance as the link, connects the intelligent Internet of Vehicles platform with the capital market.** **First**, actively introduce financial investors such as state-level industrial funds into the primary market. To give full play to the leverage of the company's own funds, on the premise of ensuring the absolute holding of the company, part of the equity will be sold through private placement and other ways, and financial investors such as large national industrial funds will be introduced to supplement the capital and improve the investment capacity. **Second**, the core assets of the charging industry group should be packaged and listed in a timely manner. On the one hand, through the public offering of shares to raise capital, to ensure the continuous large-scale investment capacity of the charging industry group. On the other hand, through the operation of the secondary market, the valuation level of the charging industry group will be improved, and the brand image and public awareness will be enhanced.

**Build a comprehensive package of financial: In terms of investment and financing**, it provides financial leasing, credit trust, factoring of accounts receivable and payable and other financing products and services for purchase of electric vehicles, photovoltaic equipment and large-scale electrified equipment. **In terms of insurance protection**, it provides compulsory traffic insurance and commercial auto insurance for individual customers to purchase and use electric vehicles. Charging pile safety liability insurance and comprehensive insurance of charging and changing station are provided for enterprise users. For urban and rural electrified customers to provide home property insurance, enterprise property insurance, electrical extension insurance. Provide quality assurance insurance to electrical equipment suppliers. Provide bidding guarantee insurance to supply chain customers. Provide solar PV module property insurance for customers purchasing PV equipment. Provide personal accident injury insurance, health insurance and life insurance for customers. **In terms of asset management**, build a new retail financial product service system featuring customer-centered, whole-process embedding, multi-dimensional coverage and intimate service.

**Table 1.** Main Composite products of industrial chain finance

Composite products	Application scenarios
Order financing + Domestic factoring	Purchase and production process order financing, domestic factoring after sales, factoring financing return order financing, and return factoring financing after payment return.
Inventory Financing+ Domestic factoring	First deal with commodity financing, deal with factoring financing and return commodity financing after commodity sales, and return factoring financing after payment is returned.
L / C + Inventory financing	L / C shall be handled in the purchasing process, and commodity financing shall be handled after the arrival of goods. The financing funds shall be used to pay the purchase payment under L / C.

## 6. INNOVATION OF NEW RETAIL MODEL OF ENERGY FINANCE

### 6.1 New retail business model of energy finance

Relying on the energy industry, the new retail of energy finance is a new mode of providing related financial products or services based on the energy demand of customers through in-depth combination of online and offline, combining with modern intelligent logistics and highly combining with innovative technologies such as big data and cloud computing. The new retail model of energy finance builds a business environment dominated by user demand and quickly responded by seller, and reconstructs the traditional "field, goods and people" into "people, goods and field" to maximize operational efficiency and enhance customer experience.

### 6.2 Financial innovation

**The first is to embed finance into the "window" of the business hall.** For private business, customers can give away free property insurance related to electricity and customers' personal when they deposit a certain amount of electricity. It can sell securities and fund financial products point-to-point when customers deal with electricity related business. To let public business, such as customer industry expansion during the execution of a packaging business, to provide financing, in view of the power consumption analysis of group clients, targeted to design some new electricity value-added financial services products, on the one hand, we can save money for customers, add value for the enterprise on the other hand, achieve the goal of win-win.

**The second is to embed finance into the products and corresponding services covered by the new "new retail" business.** The first stage provides financial services related to products (industrial chain related financial services). The second phase provides extended financial services. **In the electric vehicle business,** provide customers with auto insurance services by taking advantage of the company's professional and brand

advantages. **In the intelligent Internet of Things home appliance product system,** through signing financial service agreements with well-known intelligent Internet of Things home appliance manufacturers at home and abroad, customers who buy intelligent home appliances have priority in choosing the British Department of Finance, which can provide different benefits. **In the Targeted Poverty Alleviation Agricultural Product System,** on the one hand, customers can intervene in the supply places to provide financing assistance; on the other hand, when customers purchase or invest a certain amount of financial products or services, they can give poverty alleviation products as gifts.

## 7. CONCLUSIONS

Based integrated energy services, a smart car industry chain finance, networking, new energy finance retail energy, such as a typical Internet application scenario, in-depth analysis of the characteristics of various business scenarios and capital demand, on the basis of the constructed to adapt to the development mode of financial innovation, business scenarios for the energy the development of the Internet has laid a solid foundation.

## REFERENCES

- [1] Lu, K.G. (2001) Core Competitiveness-The Road to Sustainable Success for Enterprises. Economic Daily Press, Beijing.
- [2] Porter, M.E. (1988) Competitive advantages. Chinese financial & Economic Publishing House, Beijing.
- [3] Zhang, Y. (2003) Research on the Development Path of Mixed Operation in Financial Industry. China Finance Press, Beijing.
- [4] Kang, R.P., Ke, Y.F. (1999) Enterprise diversification. Economic science press, Beijing.
- [5] Yin, W.Q., Zang, Y.R. (1999) Chinese enterprise group system model. China Planning Press, Beijing.