Analysis and Research on the maturity of electricity retail market

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Abstract. On the basis of interpreting the policy of "new electricity reform", this paper defines the maturity level of electricity sales market after new electricity reform in China from five dimensions: potential market, emerging market, initial development market, semi-mature market and mature market. With the development of electricity sales market, the evaluation methods of customer resource value are gradually improved, and different maturity periods of electricity sales market have different influences on customer value evaluation.

1. Introduction
With the release of the new power reform plan (No.9 Document of Central Reform) "Several Opinions of the CPC Central Committee and the State Council on Further Deepening the Reform of Power System" in March 2015, and the "Guiding Opinions on Promoting the Development of Smart Energy in internet plus" issued by the National Development and Reform Commission on February 29, 2016, the process of power marketization has been further accelerated. According to the system framework of "controlling the middle and releasing both ends", the power system reform will orderly release the power distribution business to social capital, and the traditional marketing business model will be broken[1]. The fierce market competition will bring far-reaching influence to the company's business development and marketing work[2-3]. The company will face risks such as the loss of high-quality customers, the decline in the market share of electricity sales, and the brain drain of marketing management technology, which requires the company to pay more attention to improving efficiency, improving services, reducing costs and enhancing market competitiveness[4-5].

The division of maturity of electricity sales market is beneficial for power grid enterprises to accurately judge the current stage of China's electricity market. By evaluating the value of power customers with different market maturity, power grid enterprises can have a clear understanding of customer resources in different periods; therefore, it can provide strong support for power grid enterprises in the competition of electricity sales market under the background of new electricity reform, and provide reference for power grid enterprises to provide differentiated services to customers with different values.

2. Analysis of maturity model structure of electricity market under new electricity reform
The concept of maturity model originates from the Capability Maturity Model for Software (CMM) proposed by Carnegie Mellon University in the United States. The maturity model of electricity sales market can use five dimensions to analyze and evaluate the electricity trading market under the new electricity reform in China.
2.1 Electricity sales market environment

With the publication of "Several Opinions of CPC Central Committee and State Council on Further Deepening the Reform of Power System" (Zhong Fa [2015] No.9) in 2015, China's electricity sales market has ushered in new development opportunities. These policy backgrounds will become the necessary conditions for China's electricity sales cities to establish a sound energy legal system, create a good market development for establishing a modern energy system and ensuring national energy security, and will serve as policy factors for maturity evaluation.

With the development of China's economy in recent years, there is a gradual mismatch between the overall demand for electricity and the old power supply mechanism. At present, China's electricity sales trading mechanism is lacking, the utilization rate of resources is low, and no clear market price mechanism has been formed. These realities will become economic and environmental indicators to consider the maturity of the electricity sales market.

China's existing power infrastructure and future power grid and power supply planning are the technical conditions for the development of electricity sales market; Appropriate installed capacity and improvement of power generation efficiency will be beneficial to the development of electricity sales market, which is a technical index for considering market maturity.

2.2 Electricity sales market structure

Under the new electricity reform, the mature market should have multi-level characteristics, that is, diversified products, effective combination among various types of trading places, including market subjects, commodity types (such as power, capacity, auxiliary services, etc.) of electricity trading in the electricity sales market, and trading organization forms.

2.3 The quality of electricity sales market

A market with higher quality can be called a mature market. The evaluation of the quality of China's electricity sales market can be carried out from the aspects of liquidity, volatility and transparency. Liquidity and volatility are directly related to market risks, and market information transparency is the guarantee of fair, just and open bidding for market participants.

2.4 Operating mechanism of electricity sales market

Price is the representation and signal of the market, reasonable price mechanism is the key to the success of the electricity market, and risk prevention mechanism is the risk prevention measure to prevent large fluctuation of electricity price. Another factor to consider is the market balance mechanism.

Imperfect market design will hinder the transaction level of electricity sales market, so the rationality and perfection of operation rules should be considered in the evaluation of transaction operation mechanism of electricity sales market.

The transparency of market information depends on the construction of trading platform, which will also be considered as a factor of maturity.

2.5 Electricity sales market supervision system

Supervision is the main driving force of market maturity. The supervision level of a market can be investigated from the aspects of market access permit, market force monitoring and compliance supervision.

The maturity model of electricity sales market is designed according to the selected five dimensions: trading environment, market structure, market quality, market operation mechanism and market supervision. The structure diagram is shown in Figure 1.
3. Analysis of maturity level of electricity sales market

According to the five dimensions of market maturity, this paper uses five ascending grades to define the maturity grade of electricity sales market after the new electricity reform in China.

Potential market: It means that the electricity supply in this region basically keeps the old mode, and the electricity sales market has not yet developed or is in the bud of development.

Emerging markets: The embryonic form of the electricity sales market in this region has just taken shape, and some electricity sales enterprises have started to conduct pilot electricity transactions, and the future prospects are expected to be good.

Initial market development: The electricity trading in this area has been supported by policies, and the electricity trading market has initially formed, but the management system is not perfect and the market competition is not sufficient.

Semi-mature market: A large number of power companies have entered the region, and the competition among power companies such as power generation companies, power sales companies and power grid companies is fierce, resulting in the phenomenon of survival of the fittest.

Mature market: refers to the formation of power trading mode in this region. The surviving power enterprises have their own fixed customer base and relatively stable market share, and power trading has become the main component of power resource allocation in this region.

4. Analysis of the influence of maturity level on customer value evaluation

With the development of the electricity sales market, the evaluation method of customer resource value is gradually improved. The following is an analysis of the changes of customer value evaluation in different market maturity periods.

Potential market period; During this period, the electricity generated by power companies was delivered to customers through the power grid, which did not need to pay too much attention to customer resources and lacked a comprehensive evaluation of customer value.

Emerging market period;During this period, the evaluation of customer value was mainly aimed at large-scale electricity users, such as factories and shopping malls, while the evaluation of the value of ordinary residents was still in an imperfect state.

Initial market development;During this period, the electricity trading market started to face not only large electricity customers, but also residential users. At this time, it is urgent to evaluate the value of
customer resources at different levels and prepare for providing differentiated services for different customers.

Semi-mature market period; In this period, power enterprises should have the ability to provide differentiated services to different customers. At this time, electric power enterprises should not only occupy customer resources, but also maintain the relationship of existing customer groups, so as to achieve the purpose of developing new customers and enhancing the loyalty of old customers.

Mature market period; During this period, the market share occupied by each power enterprise has been basically determined, and its own inherent customer group has also been initially formed; At this time, electric power enterprises should pay attention to maintaining the relationship with customers, paying attention to the potential value of customers, striving to turn ordinary customers into high-quality customers, providing better services for high-quality customers, and paying attention to cultivating potential customers at the same time.

| The leap of maturity | Key elements | Key process activities |
|---------------------|--------------|-----------------------|
| Potential market    | Electricity supply and demand | Develop renewable energy and increase the proportion of renewable energy |
| Emerging market     | Infrastructure | Strengthen the interconnection of provinces, cities and counties |
|                     | Electricity supply and demand | Develop renewable energy and increase the proportion of renewable energy |
|                     | Transaction coverage | Expand the coverage of transactions |
|                     | Market subject | Increase market players |
|                     | Trading variety | Increase the long-term capacity, the types of traded goods before and during the day |
| Emerging markets    | Transaction organization mode | Establish a regional market within a few days before and during the day |
| Initially develop   | Balance mechanism | The forward market and the spot market are linked |
| markets             | Price mechanism | Design pricing methods, solve capacity allocation, inter-provincial compensation and other issues |
|                     | Risk prevention | Design more risk prevention tools |
|                     | Market supervision | Establish regional market supervision organizations and institutions |
|                     | Compliance with regulations | Improve the supervision of regulatory compliance |
| Initial development  | Electricity trading volume | Increase trading volume |
| of market            | Operational rules | Design a unified market operation framework |
| Semi-mature market   | Trading platform | Involving a unified market trading platform |
| Semi-mature market   | Market subject | More participation of demand-side users |
| Mature market        | Trading variety | Increase demand and trade goods accordingly |
5. Conclusion

Based on the interpretation of the new electricity reform policy, this paper defines the maturity level of electricity sales market after the new electricity reform in China, and analyzes its influence on customer value evaluation. With the addition of maturity level of electricity sales market, power enterprises can evaluate the value of electricity customers more comprehensively, and various indicators can comprehensively evaluate the benefits created by customers and the costs paid by enterprises, thus improving the accuracy and rationality of power enterprises' evaluation of customer value.

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