Research on Methods of Electricity Surveillance

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Keywords: Electricity regulation, electricity market, reform

Abstract. With the power system, deeply urgent need to establish an efficient regulatory system reform cost and risk control, improve the efficiency of the electric power industry. This article explores the mechanism design theory and its application in electricity regulation, in-depth, systematic study of the theory of electricity regulation and supervision of the main aspects of the method. With the reform of the electricity market Electricity Regulatory become the focus of attention of the industry and researchers, but electricity regulation differs from the electricity market regulation. Electricity regulation contains under the supervision of the conditions of competition in the electricity market operator, also it includes the regulation of monopoly sectors. In this paper, to explain the origin of electricity regulation, meaning and development of the electricity regulatory elements, regulatory principles, regulatory approaches, regulatory measures and other more comprehensive study.

1. Introduction

Electricity regulation is the sum of the regulatory body for all aspects of the power industry of the measures carried out supervision, control, industry regulation and the like. Regulatory agencies in accordance with technical, economic characteristics of the power industry, through the establishment of mechanisms to guide the power companies to standardize their operations, reasonable profit, promote users to optimize the power consumption behavior; natural monopoly and competitive sectors inadequate segments of control, regulation and supervision; collectively to relatively full market competition necessary supervision, management and control, in order to ensure the healthy development of the electric power industry, the protection of the public interest of the various measures.

Electricity Regulatory emerging field of research subjects by the power system, economics, public administration and other disciplines of knowledge cross formation. Regulation of electricity and power supervision should fully consider the characteristics of the power system, irrespective of the characteristics of the power system, power regulation is not sufficient to become an independent field of study, the efficiency of the power industry cannot be improved. Based on the characteristics of the power system, utilization of research results in economics and management science is the basic way Electricity Regulatory Research and Practice.

Introduce market competition can promote the power companies to reduce costs, regulation can achieve this effect. Modern control method can achieve a similar effect with the introduction of competition. France, power industry market does not reforms, but because government regulation in place, the cost of electricity also achieved reasonable results. Effective regulation of monopoly industries will make a reasonable cost, resulting in huge social welfare. Introduction of market competition and regulatory incentives are a means to improve the efficiency of power companies. China's power market and regulatory reform should adhere to both; full attention to the importance of good control mechanisms. The good market competition mechanism is introduced, while improving control measures.

2. The Main Contents of The Electricity Regulatory

According to the production processes of power industry, power generation can be divided into regulatory supervision, transmission and distribution regulatory supervision, regulation and supervision of cross-scheduling transactions and other aspects. Nature of work can be divided into mechanism design, analysis and evaluation, administrative and law enforcement. Mechanism design is designed according to the characteristics of the electric power industry for the system, power companies and users guide rational allocation of resources, and the formation of a voluntary, self-regulatory good market order. Implementation and monitoring regulatory is "eyes" of regulatory market assessment. Contents of this paper to design and market assessment mechanism-based, and runs through some major aspects of electricity regulation.

2.1 Generation Sector

Significant economies of scale power generation sector, and that the need to maintain the power system transient balance of technical, economic factors have led to a certain prevailing market power plants, research is the issue of market power plants Electricity Regulatory Research is currently the most talked about, how to determine due to network regional market power constraints caused by power plants (Local market power, or location market power) is the key to power regulation. The fundamental purpose of the reform is to improve the efficiency of electric power, electric power resources into community resource optimization configuration chain. Therefore, the assessment of market efficiency, electricity regulation is an important decision-support tool. To discover market efficiency is satisfactory to find causes loss of market efficiency, and based on this analysis solution. The cost of electricity due to precipitation of the relatively large proportion of the total cost, competition in the access links can improve power generation efficiency and reduce sunk costs, and achieved good results. Trading patterns, price mechanism and other mechanisms to design issues, is a major issue power generation market operations, received extensive attention.

2.2 Transmission and Distribution Sectors

Transmission and distribution network operators have the characteristics are natural monopolies. On the technical, economic and regulatory approach, the method is substantially the same. Transmission and distribution of natural monopoly characteristics, but also in terms of cost and pricing mechanisms, is an obvious network characteristics, namely the various parts of the grid interaction, it is difficult to define the specific equipment used by which members, as well as the extent of use. Power Flow inseparable, various factors need unified power grid, making the grid operators must maintain monopoly model. For the monopoly transmission and distribution, how to establish good cost and service quality control mechanisms are the key elements transmission and distribution regulation. Fair and open grid is a hot issue after the electricity reform. Under the traditional system, power generation, transmission and distribution business integration, and therefore a fair and open grid problem does not exist. AFTER SEPARATION, power plants should be given equal opportunity to use the transmission resources; the importance of further opening of the user, so the user has the freedom to choose right, fair and open grid issues in a more prominent. China's power under the supervision of the electricity market in the context of conduct, the regulatory body entrusted with the development of market rules, market model to determine responsibility, this article will differ according to the degree of monopoly sectors, research supervision or control programs, establish a more comprehensive electricity regulatory foundation theory.

3. Regulation of Power

The smaller power plant market, declared the smaller price changes, based essentially on their true cost, with appropriate changes based on supply and demand. Therefore, the plant should declare the reference price is relatively stable and relatively high degree of correlation with the load changes. If some large power plants are speculative, mainly one of rapid change in the form is the

declared price is ups and downs. Therefore, It is comparison the reference plant for large power plants and smoothness of the declared value..

Assessed using a reference plant method, you can select some typical independent power plant analysis, especially in the supply of the non-stress points (power center), independent assessment of the plant as a frame of reference. In order to evaluate the results more convincing; do not select a specific reference power plant, but the plant will be integrated in some cases, for example, the average reporting rate of each small market share of the plant's declaration as a reference rate, the average of the small power plants price for the reference price, and so on. Thereby avoiding the selection of special situations that may be encountered when a specific reference power plant, to avoid market distortion of evaluation results. Using a reference method can be microscopic plant assessment, but also for macro assessment. In the micro level, when indicators and benchmarks of a power plant power plant compared to corresponding indicators, when patently unreasonable, can be identified in the plant it took excessive speculation. At the macro level, when the index of large power plants generally better than or close to the corresponding index of small power plants, the competitive market is effective; when the indicators generally worse than large power plants small plants, it can be explained in large power plants to manipulate the market.

Reference plant method is a simple idea simple regulatory evaluation. In the electricity market, in general, there will always be some market share in small power plants, these plants close to price takers. So this method is generally available. This method may fail under special extreme circumstances, namely high market concentration, each power plant (the company) is relatively high market share may not find a suitable power plant as a reference plant. In this case also the market shares of different plants were compared with a reference value to draw some conclusions.

Power generation and transmission market mechanism solves the problem of vertical market power, can greatly improve efficiency, it can be concluded from the analysis of the third chapter of this paper in this regard. However, the problem of insufficient intensity of market competition may exist, market forces may result in plant efficiency losses. At the same time, electricity market reform decision-making decentralized decision-making for the market transition from unified decision-members, down decision-making level of coordination that could cause some loss of efficiency. In addition, transaction costs in terms relative to the vertical monopoly have also undergone some changes.

4. Regulation of Transmission and Distribution

Power system is a large non-linear system. In addition to large, complex, but the grid also has many outstanding technical, economic characteristics such that transmission and distribution monopoly regulation differs from other aspects of the regulation. These features include:

Largely mesh grid, according to the trend in the output impedance of the distribution grid and cannot artificially controlled. Furthermore, the grid also requires real-time balance, or grid major accidents may occur. The same is net of other utilities, such as water sector, highways, etc., not a problem. Network properties so that the costs and benefits of the grid have the global characteristics of a certain degree, so that any change in a part of, have an impact on the cost of other parts of the state, and this effect is nonlinear, difficult measure.

Grid investment does not meet the usual marginal economics assumptions, you can use the marginal cost of bringing marginal product. In the production and analysis of general merchandise in the market equilibrium, when the market is not balanced, such short supply, assuming that providers can increase small investment to get a small increase in output, so the market to rebalance. Power does not satisfy this condition, or not to increase investment, or increase the number of investment.

Transmission direct costs can be obtained through the financial data in the report, under strict supervision, to obtain relatively accurate data and by transmission price directly transferred to the user. Indirect cost measurement difficulties, there is no clear accounts figures can be checked, through professional and thorough investigation before estimated indirectly borne by the user. Therefore, for heavily regulated in terms of monopoly power Grid Company, there may be a trend,

willing to take certain measures to reduce direct costs, and indirect costs of inadequate control. China's current power transmission and distribution operations, the issue has emerged in some areas to a certain extent and in some cases transmission and distribution companies in the construction of power grids more negative aspects of performance, to be more serious power shortage, local government support after larger effort only power grid construction.

5. Summary

In the electricity market, how to combine the characteristics of the electric power industry and the assessment of regional market power is a long-term problem of concern. Instantaneous power system needs to maintain balance in the operation of the power system needs to maintain a high degree of coordination. Some power plant market share in the overall market share is small, but due to system constraints, which plants may be plants must be run. This paper points out the severity of the market in each local market forces, and can give targeted measures to reduce market power. It solved the problem of the electricity market in the assessment of market power plants.

6. Reference

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