Study on the Direct Trading Mechanism of Large User Promoting Renewable Energy Consumption in Xinjiang

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Abstract. With the constant deepening of electric power system reform and the problems about the renewable energy consumption becoming increasingly serious, the research on the large user promoting renewable energy consume locally and the pilot work has been carried out in order and achieved initial results. For Xinjiang, the renewable energy enterprises are not in the list of participator in current large user direct transaction, therefore we should intensify the construction of the outside delivery channel at the same time research the approach of the renewable energy local consumption actively. In this paper, firstly, carry on the analysis about the situation of the support on policy about large users directly trade promoting renewable energy consumption, and then research related practices in China, and finally put forward the rationalization proposal of the large user direct trading mechanism that effective promote renewable energy sources local consumption in Xinjiang on the basis of the execute solution about the large user direct transactions in Xinjiang.

1. Introduction

Large user direct trading is a form of bilateral trading in electricity market, refers to transactions that power consumer with large electricity consumption entered into bilateral power trading contracts directly with the electricity generating companies, and its specific trading patterns are flexible. As a breakthrough to promote the marketing electricity side reform, large user direct trading is a critical approach to gradual liberalization of user choice and promote a wider range of optimal allocation of resources in China.

In recent years, with the development and utilization of renewable energy sources has become an effective means of coordinating economic development and environmental protection, wind power and photovoltaic power generation has gained rapid development in Xinjiang, as of the end of June 2015 the cumulative wind power installed capacity in Xinjiang reached 8,437,300 kilowatts, China ranked third; the cumulative photovoltaic generation installed capacity (including Corps) reached 5.7 million kilowatts, ranking the country second. At the same time, the rate of abandoned wind and abandoned light in Xinjiang is among the nation top, as of the end of the first half of 2015, the rate of wind abandoned is 28.82% and 19% of light abandoned in Xinjiang. Under the circumstances of the capacity of the outer feed channel transmission is limited and network construction and power construction plan is not unified and lag, we should focus on the reasonable approach of local consumption.

However, as a critical approach to solve the problem of renewable energy local consumption, it has been actively carry out practice in Gansu Province, eastern Inner Mongolia and other regions that has intensive wind and light power industries and has achieved initial success that the renewable energy enterprises participate in large transactions directly, and it has been put forward explicitly to encourage renewable energy generation companies involved in the transaction directly in supportive documents about liberalization plan of the generation and consumption of electricity in No.9 power

reform documents. Additionally, demands of wind power, photovoltaic power generation enterprises to involve in large user direct trading are becoming more and more intense in Xinjiang. In view of this, Xinjiang should actively carry out the research on the large user direct trading mechanism promoting renewable energy consumption, guide wind power and photovoltaic power generation companies to participate in the direct transactions scientifically, so as to enhance the capacity of renewable energy local consumption.

2. Analysis on the Policy Support Situation

Party Central Committee and the State Council issued the "Opinions on Further Deepening the reform of power" same as 2015 NO.9 documents on March 15 this year, which clearly put forward to lead the market entity to carry out multilateral body direct trading and orderly explore the power generation business, the sale of electricity and user with access standards to endow self-choice right. Furthermore, in "The Implement Opinions about Well-aligned Liberalization Plan of Electricity Generation and Consumption " released in November 26, it is further proposed to allow thermal power, hydro power involved in the transaction directly, and encourage nuclear power, wind power, solar power to try to participate in, then gradually expand the proportion of direct transactions, and encourage renewable energy generation and other priority businesses to enter the market voluntarily. Thus, the policy that limit the renewable energy power generation enterprises to participate in the direct trading will be gradually dismissed, and it has become a inevitable trend that the market-oriented approach will be the way to solve the problem of renewable energy generation consumption.

3. Analysis on Practice Carried Out Situation

For renewable energy generation, it has a higher government subsidy to attract large users to use renewable energy sources by preferential subsidies which make it possible for pilot to carry out renewable energy business to participate in large user direct trading.

The Northeast Energy Regulatory Authority bring in abandoned wind power involved in the direct trading in eastern Mongolia which is the area suffer from wind power restriction. The scale of the transaction pilot is approximately 47 million kilowatt-hours, and the utilization hours of wind power in eastern Inner Mongolia has increased nearly 40 hours. At present, pilot experience is being summarized, and research to improve the trading mechanism and processes. Meanwhile, The Northeast Energy Regulatory Authority is also preparing to establish direct trading mechanism of low ebb surplus wind power transited trough region.

As the leader of conduct practice research on the direct transactions promoting renewable energy generation consumption, Gansu Province has relevant published policies, in the announced " Implementing specification of the direct trading between electricity users and power generation enterprises of Gansu Province in 2016 ", it is clearly defined that the generation access of large users direct trading including the wind power and the photovoltaic power generation enterprises that the generated output is not limited by the net rack and time, with independent legal qualification, and has been combined to the grid . At the same time, it also stipulated that the electric quantity that wind power and photovoltaic power generation enterprises involved in the transaction is 1/5 of electricity consumption by users; bundling wind power and solar power generation companies with thermal power enterprises to participate in the transaction, bundling ratio of electricity quantity for renewable energy power generation enterprises and thermal power enterprises in accordance with 1: 4, corresponding to the trading electricity quantity of electricity users; Renewable energy power generation companies enjoy priority to deal with users.

4. Design of Direct Trading Mechanism of Large User in Xinjiang

As a large province of renewable energy generation, Xinjiang actively explore scientific and rational mechanism for renewable energy power generation business participate in large users direct trading, inspire power generation enterprises to guide the use of friendly electricity of large users by price signals, so as to enhance the renewable energy generation local consumption capacity of the power grid. The design of the direct trading mechanism in this paper obey the basic principles of the "implementation plan of direct trading pilot of electricity users and power generation enterprises in Xinjiang (Trial)" and on its basis to improve.

4.1 Access Mechanism

In respect of the user access, in addition to an independent legal entity, and in line with the national energy and environmental protection regulations and other users' qualifications, the main restrictions on large power users access is the limitation of the voltage level, which supplemented with the limitation of the electric quantity. Large competitive industrial enterprises that power voltage grade level is 110 kilovolt and above, and the amount of electricity annual purchase is 50 million kilowatt hour and more (or no power restrictions), and have relatively stable electricity load, and advanced technology industrial enterprises in Xinjiang are encouraged to participate in the trading. In the future, power users will be expanded in stages to 35 kV and 10 kV according to the progress of the direct transactions pilot.

In respect of the generator access, the access conditions of thermal power enterprises remain unchanged, add the access conditions of the renewable energy power generation enterprises. Because of the drawbacks that the load fluctuations that renewable energy power generation enterprises will face once involved in the direct transaction, we should strictly control the access of the renewable energy power generation companies and ensure the trading power quality will not be too large. For Xinjiang, the implementation rules of direct trading in Gansu can be a reference, to allow grid-connected photovoltaic power and the wind power generation enterprises that the generated output is not limited by the net rack and time, with legal person qualification to participated in the direct trading. Meanwhile, restrict the quality of selling electricity, the quality of selling electricity of renewable energy generation enterprises is 20% of the electricity consumption of companies, The total monthly amount of a single new energy resources company involved in the transaction can not exceed the 20% of the average actual power generation in the first half of 2015.

4.2 Transaction Pattern

Currently, the two main trading patterns of large user direct trading in Xinjiang is negotiated bilateral trading pattern and centralized auction trading pattern. The negotiated bilateral pattern is simple and flexible that able to realize the deep game of two transactions sides, and be able to conduct the differentiated trading and pricing; centralized auction trading is more transparent, efficient, the two sides for supply and demand on a centralized auction trading platform do not need to know each other's identity, the price will guide the supply and demand sides clinch a deal automatically. With the gradual deepening of the power system reform, propose that carry out the negotiated bilateral trade and at the same time deepen the centralized price bidding pilot in Xinjiang, it will be beneficial for establishing a market-oriented price formation mechanism.

4.3 Pricing Mechanism of Transmission and Distribution Service

Currently, it is defined in Xinjiang that the regional power grid with large industrial users are implemented the two-part tariff which composed by basic price and energy price, and the other users implement the one-part tariff that contains energy price only and does not include the basic price. In order to compensate the transmission costs of the grid company properly, and improve equipment utilization efficiency of large users, we recommend that Xinjiang fully implemented two-part transmission prices and the stamp method to allocate the capacity cost of transmission and distribution, adopt the marginal cost method to allocate the cost of the transmission and distribution of electricity. For transmission line network loss: The large user undertake all the line network loss in dedicated transmission lines, The network loss in public transmission line will be allocated to each large electricity user based on the average network loss allocation method.

4.4 Compensation Mechanism of Ancillary Services Price

At present, the implementation plan of large user direct trading in Xinjiang stipulate that power grid enterprises can't charge ancillary service fee temporarily which is not conducive to guarantee the reasonable recovery of the auxiliary service cost, and in the future it will increase the system's ancillary services cost after the participating of wind and photovoltaic enterprises in the direct trading. Therefore, we recommend to establish the ancillary service prices compensation mechanism in Xinjiang's big users direct trading mode as soon as possible, in principle, take centralized management model of coordination to the dispatching management of auxiliary services, compensate reasonable cost of power grid enterprises to provide ancillary services base on cost pricing method, the associated costs finally allocated to power consumer or other benefit subject; With the gradual establishment of ancillary services market, the mechanism of exchange of medium-term and long-term ancillary services and real-time balance can be established to guarantee the safety and reliability of system operation.

4.5 Mechanism of Capacity Elimination

Currently, some provinces clarify the approach of capacity elimination in the implementation plan of the direct trading: " Eliminate the corresponding generating capacity of the power generation companies that directly involved in the transaction in accordance with the electric quantity formulated in direct trading contract." such as Anhui, Jiangsu, Fujian, etc., but the direct trading in Xinjiang did not take the way of deducting the generating capacity. It can protect the power generation enterprises to fulfill the direct trading power and planned power to eliminate the corresponding generation capacity in direct trading, but the removing generation capacity has a direct impact on the fundamental interests of the power generation business to a certain degree. To avoid the phenomenon that the enthusiasm of generating companies participate in the direct trading is not high due to the average feed-in tariff reduced for participating in the direct trading, recommended that for the power generation enterprises that qualified to obtain direct transaction, eliminate the corresponding power generation capacity accordance with the formulated contract electric quantity during the duration of contract, and the eliminated capacity is calculated according to the actual trading power and the average using hours of the similar units in proceeding five years, and do relevant adjustment based on the variation of the quarter transacted electricity quantity, the surplus generation capacity after the elimination of the direct transaction generating capacity participate in the regional electricity distribution plan according to the " San Kung" dispatching regulation.

Eliminated capacity of the power unit = annual direct trading electric quantity of user contract / (l-integrated house supply consumption rate) / the average using hours of the similar units in proceeding five years.

4.6 Mechanism of Supervision and Administration

Because the renewable energy power generation enterprises directly involved in the transaction is still in the early stages, the trading market can not be liberalized to all the enterprises and users, so it requires the relevant departments to review the access qualifications of the transaction participants, and control the access strictly to avoid default phenomenon in maximum. First, Relevant departments shall formulate the administrative measures of the main market players access the direct trading market separately, audit the market subject applying to enter or exit the direct trading market by specific department; report the result to third parties for the record; Second, the relevant government departments take the responsibility for supervision and audit for distribution and transmission electricity price calculation work; Third, specific third parties responsible for the supervision and administration of the market members and market behavior in accordance with the law; Fourth, related contracts about directly deal of power users and power generation companies should be reported to the government authorities and power supervision institution respectively for the record; Fifth, supervision department should set clear penalties on the corresponding offenses; Sixth, as the market matures, gradually reduce the regulatory provisions and increase the effective incentives.

5. Conclusion

Through analysis of supporting policy and the situation of practice carried out about the renewable energy power generation enterprise participate in the large user direct trading, draw a conclusion that the inevitable requirement for China to establish a competitive electricity market and restore commodity property of the electricity is that the government and enterprises gradually realize to solve the problem of renewable energy consumption in market-oriented means. Under the background of the outside delivery ability is close to saturation and the rate of wind abandon and photovolt abandon remain a high level in Xinjiang, based on enforcement regulation of the direct trading(trial), this paper put forward relevant suggestions to promote the direct trading mechanism of large user promoting renewable energy consumption from six major aspects which including the access mechanism, transaction model, pricing of transmission and distribution service, ancillary services compensation, elimination of capacity, and supervision and administration, which provide critical reference to promote the level of renewable energy consumption in Xinjiang.

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