428th Forum on Research Works on December 19, 2017

Electric Utility Industry Outlook and Challenges for 2018

<Summary>

The Institute of Energy Economics, Japan
Junichi Ogasawara
Senior Economist and Manager, Electric Power Group, Fossil Fuels & Electric Power Industry Unit

Spot electricity market outlook and retail competition

1. As renewable energy power generation expands, day-ahead spot electricity prices are falling. Prices had been close to oil power generation costs but now tend to follow changing gas and coal power generation costs in some regions and time slots. The tendency is likely to grow stronger. In FY2018, prices could be maintained at present levels of around 8 yen/kWh due to crude oil price hikes. Electricity trading volume has been increasing thanks to gross bidding (in which some electricity for intragroup transactions is released to the market) that traditional electric utilities launched in the spring of 2017. As of August 2017, trading volume expanded to 5.4% of total power generation. As indirect auctioning of grid interconnection line trading (subjecting bilateral trading through grid interconnection lines to trading via the exchange) is planned to start in FY2018, the uptrend is likely to continue.
2. As electricity retail competition intensified, the rate of switching from traditional electric utilities to new retailers called power producer and supplier companies rose to 12.1% in August 2017. The rate has been rising in Hokkaido, Tokyo and Kansai. Particularly, the rate in Kansai rose to 18.6%, close to 20%. As retailers' profit margins have narrowed gradually for high-voltage and other users due to intensifying competition, the business environment has grown severer for PPS companies. They will consider whether to continue their business operations, depending on their supply capacity expansion accompanying the introduction of the baseload power source market for releasing electricity generated by nuclear and coal power plants and on their new costs for the capacity market. A rising number of PPS companies may withdraw from the market within FY2018.

Integrating renewable energy power generation

3. Renewable energy power generation has been expanding, topping 10% of total power generation in Japan in the spring of 2017. As renewable energy power generation centers on solar photovoltaics, limited capacity for connecting solar PV facilities to

electric grids has become a constraint in some regions. In this respect, Kyushu Electric Power Co. is expected to restrict output in FY2018.

4. An emerging challenge is how to secure adjustment capacity to respond to prediction errors and output fluctuations for renewable energy power generation. In Kyushu Electric Power's service area, fluctuations in net load (= electricity consumption minus renewable energy power generation) have exceeded 2 million kW per hour. Energy trading products to address such sharp output fluctuations and relevant prediction errors are growingly required to be designed.
5. As renewable energy power generation is mostly connected to power distribution systems, limited substation capacity makes additional connection difficult in an increasing number of regions. In the Solicitation Process for renewable power generation, efforts are being made to level costs for increasing substation capacity. As some companies are reluctant to bear any additional costs, however, such efforts are not necessarily made smoothly in all regions. Under consideration is the connect and manage scheme that is implemented in such countries as the United Kingdom to accept additional connection on condition of output control. Some direction is expected to be given in this respect within FY2018.

Various new markets and their outlook

6. In FY2018, indirect auctioning of cross-regional interconnection line trading (subjecting bilateral trading through cross-regional interconnection lines to trading via the exchange) will start along with a non-fossil value trading market to separate and auction the environmental value of non-fossil electricity to sell non-fossil value certificates for electricity covered by the Feed-in-Tariff system. Planned to start in FY2019 are a baseload power source market, the introduction of indirect power transmission rights to hedge region-to-region price gaps, and trading in non-fossil value certificates for non-FIT electricity. Their details will have to be worked out with relevant systems being developed.
7. The capacity market, expected to greatly influence fossil power generation investment plans, is scheduled to start trading in FY2020. Its design will have to be worked out to some extent within FY2018. The capacity market is designed to maintain peak supply capacity for which fixed costs are difficult to recover through wholesale power trading. Coal power generation holds an advantageous position in the energy market, while gas power generation has such position in the capacity market. Therefore, the future designing of the capacity market will exert influences on future power plant investment.
8. Other various new markets are also under consideration, including those on which consideration has been slow. As new markets' opening can change the competitive

structure, it is difficult for stakeholders to accept new markets before their overall picture including gains and losses is clarified.

9. While renewable energy power generation is politically expanded, how best to balance and position the energy (kWh) market, the capacity (kW) market and the adjustment capacity (ΔkW) market must be verified.
10. The United States has tried to price electricity as adequately as possible by promoting an electricity wholesale market reform to integrate renewable energy power generation with storage batteries and other new technologies. As pricing has been distorted in actual electricity wholesale trading due to many electricity sources for which output is difficult to change, the United States is planning to reflect fluctuation and additional costs in pricing as much as possible in anticipation of renewable energy power generation expansion. Japan will have to deepen discussions on its next-generation electricity system in anticipation of progress in decentralization of supply capacity.

Contact :report@tky.ieej.or.jp