

Research and design of demand response aggregation system interaction interface based on the Internet home appliance

Songsong Chen

**Engineer, Electricity Utilization & Energy Efficiency Research Department, CEPRI
Beijing, China**

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Abstract

China's national strategy development for Energy Internet provides important policy foundation for the development of the demand response. In recent years, the development upsurge of demand response is gradually warming. But in the demand response pilots of Beijing, Suzhou, Foshan, Shanghai and other places, the involved users are mainly industrial and commercial users, the proportion of residents is relatively low. In order to expand the proportion of residents of demand response users and give full play to the resident user side load capacity resources in the role of demand response, we must make full use of information communication technology and the emerging Internet appliances cloud platform, and make the integration of Internet appliances innovation and demand response services and actively create a new construction and operation pattern of demand response system.

In this paper, the residential demand response information exchange mode is proposed. One is horizontal information exchange model based on HAN. When DR terminal receives demand response event information from aggregation system and the appliances control command is formed, DR terminal will send control commands directly to the appliances through the HAN network, making the corresponding adjustment according to the control command, and returning execution confirmation information to the DR terminal through the HAN network. The other is vertical information exchange model based on Internet. When DR terminal receives demand response event information and the appliances control command is formed and sent to the appliance manufacturer server, appliance manufacturer server sends the control command to appliances through the Internet, and the appliances receive the control command and make adjustments, finally return confirmation information along the original path. The whole process of information exchange is carried out through the Internet, which is different from the horizontal information exchange model based on HAN.

Besides, demand response aggregation system architecture based on the "Internet+" is designed. The aggregation system connects not only demand response service system and DR terminal, also the service host of appliances cloud platform and client software on mobile phone of users. At the same time, it also connects with other aggregation systems, which can realize the cascade of aggregation system so as to massively aggregate and manage the user load. Then, the appliances cloud platform aggregation interface is designed, including the position and function of the interface. Finally, the application ex