عنوان مقاله:

Energy Management in Distribution Systems Considering Consumer Behavior and Internet of Things

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خلاصه مقاله:

Internet of Things (IoT)-based energy management systems (EMSs) are considered a new technology in which consumers can manage their electricity payments according to their preferences, such as reducing costs or increasing satisfaction. Each consumer has its own program for communicating with a central control unit. In addition, the central control unit that is responsible for energy pricing can access consumer information and network performance status through the IoT infrastructure. Therefore, technical analysis can be performed using big data to determine the optimal price in order to make a compromise between the buyer and the goals of the distribution system operators. This paper presents a model to accurately assess the impact of pricing on the behavior of IoT-based energy systems. Then, according to the load specifications of each item and the technical limitations of the distribution network, the best time to use pricing is determined. The results show that the higher the price variance, the more discomfort the consumer and the lower the daily payment. Therefore, in this paper, the main goal of energy management is to minimize the total weight of the costs paid and their discomfort level. The paper could facilitate further penetration of IoT-based EMSs into smart grids. The study was performed on an IEEE standard ۳۳-bus network. Optimization was implemented using YALMIP and MOSEK toolboxes. Therefore, it can be concluded that IoT technology allows consumers to enjoy the benefits of the .network and makes optimal consumption management possible

کلمات کلیدی:

Internet Of Things, Distribution networks, Energy management, Smart grids, Consumer discomfort