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Review of peer-to-peer energy trading: Advances and challenges

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Abstract-

The power system is confronting progress due to the high integration of distributed energy resources (DERs). These DERs are expected to cause challenges for power system operations. Therefore, innovative management approaches were proposed for integrating DERs in future power systems and maximizing DER owners’ benefits, such as peer-to-peer (P2P) energy trading. Direct energy trading between users is made possible by P2P energy trading, which supports bulk power infrastructure operations while supporting local power and energy balance. P2P energy trading is a promising approach to expanding the installation of renewable energy sources and achieving the system flexibility required for the shift to low-carbon energy. The grid is anticipated to gain from P2P energy trading by having lower reserve requirements, peak demand, and network losses. Many studies and pilot projects have shown how P2P energy trading benefits prosumers as well as the grid. However, the widespread use of such trading models remains limited in today's electrical markets. This paper reviews recent advances in the P2P energy system and a perceptive discussion of the challenges that are keeping P2P from becoming a viable energy management solution in the present electrical market. First, the energy network is covered in this paper's description of these new P2P markets; next, the types of P2P energy trading, moving on to the market structure. Then, the technologies and technical approaches behind P2P energy trading are covered. After that, P2P energy trading advances in different systems are discussed. Finally, we identify challenges before making some concluding remarks.

Index Terms- Peer to peer energy trading; Local energy markets; Transactive energy, Energy communities

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