Transactive control: a framework for operating power systems characterized by high penetration of distributed energy resources

The increasing number of distributed energy resources connected to power systems raises operational challenges for the network operator, such as introducing grid congestion and voltage deviations in the distribution network level, as well as increasing balancing needs at the whole system level. Control and coordination of a large number of distributed energy assets requires innovative approaches. Transactive control has received much attention due to its decentralized decision-making and transparent characteristics. This paper introduces the concept and main features of transactive control, followed by a literature review and demonstration projects that apply to transactive control. Cases are then presented to illustrate the transactive control framework. At the end, discussions and research directions are presented, for applying transactive control to operating power systems, characterized by a high penetration of distributed energy resources.

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