

Simulation Method to Evaluate Mutual Impact between Smart Community and Distribution System

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Session 3

Keywords: (Distribution System, Photovoltaic System, Battery Energy Storage System)

Abstract

Large number of distributed generations such as photovoltaic systems (PVs) and battery energy storage systems (BESs) have been installed in distribution systems. And, there may be some smart communities using PVs and BESs around the demand area. Then, the smart communities will operate distributed generations to optimize their local objectives, such as cost minimization of them.

The operation of the smart communities may cause the demand fluctuations, and may have impacts on the distribution system, such as power flow fluctuations and voltage fluctuations. To evaluate these impacts on the distribution system, a simulation method is necessary.

Therefore, in this study, simulation method to evaluate the mutual impact between a smart community and a distribution system are proposed. And, the impact of the BESs operated by the smart community is studied by the simulation analyses using the proposed method.