Optimal capacity configuration of energy storage system for co-operation of generation/energy storage/load in Business Park

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Abstract

Local Multi energy system including photovoltaic power generation, CCHP system and energy storage system on Business Park as an application form of green building is been concerned. Energy storage system is an ideal choice to maximize acceptance of photovoltaic power generation, and achieve adjusting and controlling of power supply and consumption in local distribution network. Under the premise of current price of energy storage system, the optimal configuration of power and capacity of it becomes especially important.

Based on the load coefficients of different types of functional architecture in the specific month/ day, depicts the cool and heat power load curve monthly and hourly. According to the power supply curve hourly of photovoltaic power generation system, establishes the mathematical models of energy consumption, power consumption and power supply about local distribution network of Business Park, analyses the characteristic relationship of power supply and consumption, then, proposes optimal power and capacity configuration method of energy storage system based on sort linear programming method for solving the optimal equation, to ensure the target of maximizing the utilization of the power output of CCHP system and photovoltaic power generation system in the park.

As an example, by calculation and analysis, we proves the validity and feasibility of the method in a typical regional business Parks.