Multi-objective optimization method for microgrid

What is multi-objective energy management in a microgrid?

Achieving optimal operation within a microgrid can be realized through a multi-objective optimization framework 56, 57. In this context, the primary goal of multi-objective energy management in a standard MG is to determine the optimal power generation set points and the appropriate ON or OFF states for distributed generation units.

What is vectorial microgrid optimization?

Conventional microgrid design approaches consider a fixed power architecture, focusing mainly on improving the financial aspects of the design by sizing its energy sources. This paper introduces a new Vectorial Microgrid Optimization (VMO) design method for critical loads.

How to optimize a microgrid?

The overall structure of the optimization mechanism follows the steps below. First, input the data and build a microgrid model (Section 2). Next, establish the objective function and specify the range value of the solution (Section 4).

Why is multi-objective optimization necessary in a grid-connected mg?

Multi-objective optimization of cost and emission in a grid-connected MG is necessary to balance economic efficiency, environmental sustainability, regulatory compliance, and social responsibility 60, 61.

Can a multi-objective weight method reduce uncertainty factors in a microgrid?

The simulation results showed that the multi-objective weight method could diminish the influence of uncertainty factors,promoting the full absorption of renewable energy and full load-bearing. Additionally,the orderly charging and discharging mode of EVs could reduce the operation cost and environmental protection cost of the microgrid.

How to design a microgrid?

Microgrids should be carefully planned and optimized to meet the power requirements of critical loads and justify their economic viability. Conventional microgrid design approaches consider a fixed power architecture,focusing mainly on improving the financial aspects of the design by sizing its energy sources.

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