

Method for constructing interconnected microgrid groups

Why is interconnection of microgrids important?

The interconnection of microgrids can improve reliability, reduce emissions, expand energy options in the future power system, add redundancy, and increase grid security. The normal operation of the network of microgrids should be oriented to achieve a better economic return with respect to the single operation of the microgrid.

How are microgrids connected?

The elements of each microgrid are connected by a Local Area Network (LAN) of fieldbus. Due to the geographical distribution, the microgrids are interconnected among them and with the aggregator using a Wide Area Network (WAN). Different possibilities are as follows:

What are the functions of microgrids?

It covers functionality of microgrids including operation in grid-connected mode, the transition to intentionally islanded mode, operation in islanded mode, and reconnection to the grid, specifying correct voltage, frequency, and phase angle.

What is the energy management problem of interconnected microgrids?

This chapter is devoted to the energy management problem of several interconnected microgrids. EMS of a network of microgrids must determine the power flows inside each microgrid and with the main grid (as in Chap. 4), but also the energy interchange among them. This is an extension of a single microgrid EMS and MPC is an alternative to solve it.

Should a microgrid be integrated with a utility grid?

So the integration of the different agents will always be aligned to reach a better performance in the energy management problem than operating as a single microgrid. But in addition, microgrid networks should be prepared to operate independently of the utility grid in case of faults and congestion.

What is a basic management system for three interconnected microgrids?

In order to evaluate different algorithms, a basic management system for three interconnected microgrids (\ (MG_1, MG_2\)) and \ (MG_3\)) will be considered. The system is an extension of the case study presented in Chap. 4.

interconnected microgrids will play an important role in industrial parks, development zones and other scenarios. This paper establishes an operating mode structure of interconnected ...

""[A microgrid is] a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect ...

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The simulation model of DC microgrid clusters with three sub-microgrids is built in PLECS to verify the proposed control method. The sub-microgrids are connected with each other by a TAB ...

It covers functionality of microgrids including operation in grid-connected mode, the transition to intentionally islanded mode, operation in islanded mode, and reconnection to ...

This paper proposes a consensus-coordinated control strategy to improve the stability and reliability of interconnected direct current (DC) microgrid cluster systems based on ...

In this paper, the requirements of digital transformation of distribution network are analyzed, the concept of "energy-information-control-service" multi-flow fusion of distribution network is ...

The power mismatch between the generating capacity of distributed energy sources and the load demands of all the microgrids is taken into consideration in this study, a smart interconnection ...

2. Interconnected microgrid structures The three most common types of MGs depending on the power type include: i) DC microgrids (DCMGs), ii) AC microgrids (ACMGs), and iii) hybrid AC ...

