Niger interconnected microgrids

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.

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 independentlyof the utility grid in case of faults and congestion.

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 is a DLT-based interconnected smart microgrid?

The emergence of distributed and decentralized power systemswith DLT-based interconnected smart microgrids has given rise to change in the existing protocols,process flows,and frameworks. This concept of power grid has been called by different names - TransActive Grid [11]and Energy Internet [12,13]are some of the popular names.

What is a microgrid system?

The system is an extension of the case study presented in Chap. 4. Each microgrid i is composed of a battery, a hydrogen system (a storage system, electrolizer, and fuel cell allowing bidirectional power flows), renewable generation (solar and wind), a local load, interconnection with other microgrids and also to the grid (see Fig. 8.7).

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 ...

Universal electrification in Niger is a goal that will require participation from a diverse group of stakeholders.

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The Niger MiniGrid Feasibility Study (MGFS) is considering the potential impact ...

Research is ongoing to improve the efficiency of monitoring interconnected microgrids. One research focus in aims to transition distribution networks from hierarchical to distributed structures, with the growing use of ...

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