European Solar and Energy Storage Solutions

Possible topologies of DC microgrids

Overview

These different structures are as follows:Single bus topology. This topology is the simplest topology since it is constituted by a single DC bus. Due to that, all generators, storage systems and loads will be connected to the same point (bus). Radial topology. This topology can be considered as an extension of the single bus. Ring or loop topology. Mesh topology. Interconnected topology. .

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The DC microgrid topology is classified into six categories: Radial bus topology, Multi bus topology, Multi terminal bus topology, Ladder bus topology, Ring bus topology and Zonal type bus topology. The DC microgrid structure is a function of the following factors: robustness, controllability, economic rate of the system, utilization of the .

Typically, there are two possible configurations: series and parallel. In the first configuration, two or more DC microgrids can be interconnected in series (Figure 2 a), while the other one is interconnected in parallel (Figure 2 b).

This article presents a comprehensive review on the control methods and topologies for the DC microgrids. First, five topologies and equivalent structure diagrams are presented and discussed. Then, a hierarchical control encompassing primary, secondary and tertiary control is discussed and studied in detail.

Power-sharing and energy management operation, control, and planning issues are summarized for both grid-connected and islanded DC microgrids. Also, key research areas in DC microgrid planning, operation, and control are identified to adopt cutting-edge technologies. This review explicitly helps readers understand existing developments on DC .

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