Control strategy for energy storage in power system

Overview

This paper focuses on the design, modeling, and analysis of the coordinated power control strategy for a grid-connected hybrid energy storage system based on VSG (VSG-HES). They offer the necessary flexibility to balance supply and demand, manage congestion, and ensure power quality. From large-scale solutions like pumped hydro and compressed air energy storage to distributed technologies such as batteries and hydrogen fuel cells, the role of storage is expanding. These operational conditions accelerate battery aging, reduce cycle life, and increase the levelized cost of storage over time. This limitation has motivated the development of alternative system architectures, which aim to offload the high-frequency and transient power demands from the battery to. Grid-forming-type energy storage is a key technology for addressing the large-scale integration of renewable energy and achieving the goals of carbon neutrality. Virtual Synchronous Generator (VSG), due to its inertia support function, is currently the most focused grid-forming control method.

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Coordinated Power Control Strategy of Hybrid Energy Storage System

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coordinated power control strategy for a grid-connected hybrid energy storage system based on VSG (VSG-HES).

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Instead, a combination of appropriate storage technologies, optimized control strategies, and robust economic planning is essential for the future of electric power systems.

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Frontiers , Switching control strategy for an energy storage system

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