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Taiwan Power Company Actions under High Renewable Energy Penetration

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Abstract

Following the global trend toward achieving net-zero carbon emissions, renewable energy has been rapidly expanding. In this context, the reduced operation of traditional generators has posed challenges to system stability and resilience.

This article first presents the key achievements of Taiwan Power Company (Taipower) in the Kinmen Smart Grid project, covering areas such as energy storage systems, energy management systems, enhanced protection strategies, and cybersecurity upgrades.

Next, it highlights the role of microgrids in the power system, using the microgrid at the Taiwan Power Research Institute's Shulin campus as a demonstration case. The planning, design, and construction were carried out in accordance with IEEE 2030.7, aiming to standardize microgrid development. Additionally, a microgrid verification and integration platform has been established to facilitate the functional verification of future related equipment.

Finally, the article discusses the strategies Taipower has implemented in the main island system, including power scheduling, energy storage system utilization, inertia maintenance, and voltage regulation. Looking ahead, Taipower will continue to adopt international best practices and make ongoing improvements to ensure stable system operations.