

## Distributed Energy System - Microgrid Integration of Hybrid Power Systems

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**Abstract :** Planning a hybrid power system (HPS) that integrates renewable generation sources, non-renewable generation sources and energy storage, involves determining the capacity and size of various components to be used in the system to be able to supply reliable electricity to the connected load as required. Nowadays it is very common to integrate solar photovoltaic (PV) power plants for renewable generation as part of HPS. The solar PV system is usually balanced via a second form of generation (renewable such as wind power or using fossil fuels such as a diesel generator) or an energy storage system (such as a battery bank). Hybrid power systems can also provide other forms of power such as heat for some applications. Modern hybrid power systems combine power generation and energy storage technologies together with real-time energy management and innovative power quality and energy efficiency improvement functionalities. These systems help customers achieve targets for clean energy generation, they add flexibility to the electrical grid, and they optimize the installation by improving its power quality and energy efficiency.

**Keywords :** microgrids, hybrid power systems, energy storage, grid code compliance

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