Special Issue

Innovative Advances in Monitoring, Control, and Management of Microgrids

Message from the Guest Editors

Microgrids are a new energy paradigm derived from the digital transformation applied to small-scale energy facilities. In this novel scenario, locally-available energy sources, storage equipment, and load supply are combined in a coordinated smart manner. Microgrids can include renewable/nonconventional energy sources as well as energy carriers such as hydrogen and can operate connected to the main power grid or in stand-alone mode. Microgrids, mostly those based on renewable sources, help to reduce environmental pollutants, greenhouse emissions, and dependence on fossil fuels, contributing to sustainable development. Large-scale deployment of microgrids requires facing a number of scientific and technical challenges, from design aspects to precise digital simulation of the facility. Among these challenges, severe research efforts are devoted to develop advanced monitoring, control, and management systems for microgrids. These systems are compulsory to deal with the uncertainties of renewable energy sources (photovoltaic, wind, etc.) and changes of the load demand in order to provide a reliable, energy-efficient, and environmentally-friendly operation.

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