

International Conference on Sustainability in Energy and Buildings

Invited Sessions

Title of Session: Energy management in microgrids integrating green and renewable energy sources

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Description:

In recent years, electric utilities are paying close attention to efficient, ecologic, and cost-effective electricity marketing. The deployment of a network structure integrating renewable energy sources and localized energy management systems, referred to as microgrids, is one of the most important developments of the energy transition.

A Microgrid (MG) is defined as a group of loads, distributed microsources and power converters operating as a controllable system, providing electric power to its near area. During the last years, the importance of MG concept has increased considerably. MG often face difficulties in supplying demand due to the lack of sufficient energy generation sources caused by the intermittent nature of renewable energy sources. As a result, it is necessary to use an energy management system (EMS) with an Energy Storage System (ESS). EMS for a microgrid represents relatively new and popular topics that attracted lots of attention. In most cases, ESSs maintain the power balance between generation and consumption by storing power during inexpensive or off-peak hours and discharging it during high-price or peak hours. Although existing studies in literature have investigated microgrid EMSs from different aspects, there are still scientific obstacles to overcome to optimize the microgrid structures and performances.

The aim of this invited session is to promote interaction and cooperation between industrials and academics by addressing a number of advanced issues in energy management strategies in standalone and connected microgrids. Some applications as residential microgrids, industrial microgrids, and electric vehicles are highlighted. This section will outline many open problems and advances in the areas of microgrids control and stability, energy storage systems performances, electric load forecasting, and zero CO₂ emissions,.

The scope of this special section includes, but is not limited to:

- Intelligent power management and distribution
- Multisource hybrid system integrating green and renewable energy sources
- Microgrids sizing and planning
- Dynamics and stability control in microgrids
- Multilevel converters in microgrids
- Energy storage system performances, diagnosis, and life cycles
- Electric load forecasting and management
- Fault detection and isolation in microgrids
- CO₂ evaluation and new microgrids structure approach for zero CO₂ emissions
- Applications: residential microgrids, industrial microgrids, electric vehicles...

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