

Microgrid Overview and Research

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This presentation will first discuss some of the main motivations and definitions of microgrids. The main components of microgrids, i.e. distributed generation and energy storage systems, will then be briefly reviewed, and three main microgrid research subjects will be discussed, from the perspective of my group's research activities, starting with a discussion on planning aspects related to the optimal sizing and selection of renewable generation in microgrids, especially for remote, isolated systems. This will be followed by a review of control definitions and issues in microgrids, concentrating on secondary control or energy management system (EMS) technologies. Finally, an overview of stability studies and issues in microgrids will be presented, focusing on the impact of an unbalanced grid on some of the system DGs, and presenting primary-control solutions to address some of the particular problems arising from unbalance system conditions.