Abstract

The increasing demand of reliable, secure, clean and sustainable electrical energy has led researchers to investigate new ways to extract energy from renewable sources. Microgrids with distributed generators (DG) are being implemented with renewable energy systems in order to improve the maturity of microgrid technology. Alternative energy sources like hydro, geothermal, biomass, wind, solar, hydrogen, nuclear and fossil fuels need to be made to work together in different combinations as a single unit to meet a common demand area. Thus, hybrid renewable energy systems (HRES) describes a system having different DGs integrated to power the customer’s demand.

Among different aspects of microgrid, this presentation focuses on controls of microgrid with hybrid renewable energy systems. A comprehensive review on contemporary control methodologies is provided with a discussion on challenges of microgrid controls. Basic simulation results are also presented to enhance and support the analysis. Finally, research needs and road map for microgrid control are also described.