AALBORG UNIVERSITY
DENMARK

PhD Position within Power quality in grid-connected and islanded MicroGrids

Within the programme Science without Borders, Aalborg University is offering a PhD position at the Department of Energy Technology, Pontoppidanstræde 101, DK-9220 Aalborg East.

The position is administrated by "Science without borders" and financed by stipends through CAPES. The overall theme is "Renewable Energy". Acceptance of employment is on condition of the grant from CAPES.

Distributed Generators (DGs) may be connected individually to the utility grid or be integrated to form a local grid which is called microgrid (MG). The MG can operate in grid-connected (connected to the utility grid) or islanded (isolated from the utility grid) modes. DGs often consist of a prime mover connected through an interface converter (e.g. an inverter in case of dc-to-ac conversion) to the power distribution system (microgrid or utility grid). The main role of this inverter is to control voltage amplitude and phase angle in order to inject the active and reactive power. In addition, compensation of power quality problems, such as voltage unbalance, can be achieved through proper control strategies. The Thesis will be focused on enhance power quality (voltage harmonics and unbalances) when the microgrid is working is island, following the recent approved standard IEEE 1547.4-2011, and low voltage ride through and improve the power quality at the point of common coupling when it is working in grid connected mode. The power quality should be improved by using coordinated control between the units and a centralized control that will give references to each one.

Optimization methods to achieve operational efficiencies, active/reactive power flow control and voltage harmonics/unbalances compensation. Analysis of low voltage ride through capabilities where MicroGrids act as ancillary systems giving power quality support to the main utility grid. Finally, fault-tolerant control strategies for self-healing and anti-islanding purposes will be investigated.

Requirements:

Master on Electrical Engineering, Power Systems, Power Electronics

Language English

Contact person: Professor Josep M. Guerrero, e-mail: joz@et.aau.dk

To apply please see the link below:
http://www.en.tek-nat.aau.dk/vacant+positions/Science+without+Borders/