

PhD Position in Standalone and Intertied Microgrids

Investigation of microgrids is an on-going research program at the Department of Energy Technology at Aalborg University, Pontoppidanstræde 101, DK-9220 Aalborg East. The program studies various aspects of microgrids, distribution generation and renewable energy harnessing, and has accumulated a number of important findings.

To further excel with the research, a PhD project is planned whose purposes are to develop new control schemes and methods for quantifying stability of standalone and/or intertied microgrids. The investigation would involve analytical work, simulation and experimental testing with a suitably sized intertied system. The results obtained are expected to benefit the design of future grids where deployment of safer alternative sources and storage systems is likely to expand.

The position is administered and funded by the “Science without Borders” program through the Brazilian Federal Agency for Support and Evaluation of Graduate Education (CAPES). The theme of focus related to the position is listed as “Engineering and Other Technological Areas” in the program. Acceptance of employment for the position is subject to the approval of grant from CAPES.

Title: Control and Stability Issues of Standalone and Intertied Microgrids

Hypothesis: Microgrids belong to a new architectural concept proposed for incorporating more alternative green sources and storage systems. They provide more flexibility in meeting the ever-tightened modern load requirements.

Description: Microgrids are small grids formed by grouping distributed sources, storage systems and loads together. Strictly speaking, voltage and frequency within each microgrid need not be standardized to the same values, implying that intertying of multiple microgrids for reserve sharing can be challenging. Even when realized, stability concerns of intertied microgrids must be quantified in order to provide confidence to the utility, industry and end users. To address these concerns, a project is planned to study aspects affecting the proper control and stability of intertied microgrids. For completeness, investigation will also be performed for standalone microgrids to identify problems and solutions that have not yet been discussed.

Results: 1) Control schemes for operating microgrids in different operating modes, named respectively as grid-connected, islanded and intertied modes. 2) Methods for quantifying stability of standalone and intertied microgrids.

The PhD position is for the period from 2013 to 2016. The PhD student will be a member of a very strong research team at AAU/ET (approximately 80 PhD students in year 2012) working on power systems, power electronics or both. AAU/ET has a strong link with the industry, utility and academia, and has many on-going research programs in the general scope of power engineering.

Applicants for the PhD position should have a Master in Electrical Engineering with an emphasis on power engineering. Applicants should preferably have some

experience with power electronics and its application to power systems. The language of communication at AAU/ET is English (written and spoken).

Further information can be obtained from Poh Chiang Loh at pcloh@ieee.org or Professor Frede Blaabjerg, e-mail: fbl@et.aau.dk

To apply please see the link below:

<http://www.en.tek-nat.aau.dk/vacant+positions/Science+without+Borders/>