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Assistant Professor in Active Distribution Grids and Smart Energy Systems (2023-224-05232)

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Company: Aalborg Universitet

Location: Aalborg

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Job description

Aalborg University contributes to the knowledge building of the global society as well as the development of prosperity, welfare, and culture of Danish society. This is accomplished through research, research-based education, public sector services and knowledge collaboration. Aalborg University educates students for the future and activities are based on a dynamic and transformative collaboration with the surrounding community.

AAU Energy is a dynamic engineering research department in continuous growth and inspiring surroundings. AAU Energy has a very international environment and covers all areas of clean and sustainable energy systems of the future within electrical, thermal and mechatronic energy technology. AAU Energy has campuses in both Aalborg and Esbjerg, this position is in Aalborg.

The mission is to be world leading in both research and research-based education of the energy engineers of the future. AAU Energy has approx. 300 employees of many nationalities, of which 25 are administrative staff. In addition, AAU Energy constantly has approx. 50-70 guest researchers from around the world.

Research and teaching are in the absolute world elite in the field of energy, and we have extensive and leading workshop and laboratory facilities, where research and innovation are

carried out in direct collaboration with industry to a great extent.

The position is offered in relation to the research program “Intelligent Energy Systems and Flexible Markets” and the assistant professor will be positioned to the section of Electric Power Systems and Microgrids.
The assistant professor will work on the projects “SERENE- Sustainable and integrated energy systems in local communities and SUSTENANCE – Sustainable energy Systems for Achieving Novel Carbon Neutral Energy Communities both funded by European Union H2020, as well as on the EFFORT – Electrification and flexibility provision from Greenport North project funded by Elforsk.

Research areas will be within: Modelling and control of active distribution grids and smart energy systems, provision of energy flexibility and ensuring demand response and integration of renewable power generation.

The mentioned projects focus on establishing flexibility for private households including heat pump control as well as electrical vehicle charging, including different storage possibilities as well as from industry using control in the different industrial processes at the port of Hirtshals.
For both cases the purpose is to ensure sufficient capacity for the distribution grid and hosting capacity for new renewable production. Therefore, the systems should be set up to use as much as local generation as possible and control the consumption to periods with high production whenever possible, still obeying user comfort and different limitations in the industrial processes.

In summary, the Assistant professor will work with:
Modelling of distributed energy systems for private household areas as well as industrial sites (ports)

Energy Flexibility provision and demand response

Assessment of the power system technical performance of weak grids, with focus on ensuring sufficient capacity for demand and local production

Simulations in Matlab, and PowerFactory and PSCAD

Setting up hardware in the loop test of control methods in real time digital analyzers as RTDS or OPAL RT

Teaching courses in Power systems area and supervision of student projects of which some of them are to be taught in Danish (the department can offer a Danish Language course if needed)

The candidate should possess a PhD degree in Electric Power Systems having 3-4 years of research experience around modeling, optimization and control of electric power distribution grids, grid integration of distributed energy resources and multi-energy systems. Research experience in demand response, demand side management and control strategies to utilize flexibility from industrial loads and smart integration of electric vehicles, heat pumps etc. are desired. Further, the candidate should have experience with software tools for power system simulations like DIgSILENT Powerfactory, PSCAD etc. Experience in real-time digital simulators like RTDS or OPAL-RT for power system studies is an added advantage. The candidate should have experience working in externally funded projects and have a very strong publication record in highly ranked journals.
Experience in teaching/supervising with problem-based learning approach will be considered as an advantage.

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