Hiwi & Bachelor/Master-Thesis

Development of a Dynamic Phasor Solver for Real-Time Simulation

Context
There are several challenges, which will have to be addressed when the share of renewable energy sources is increasing drastically to 100% or close to it. These challenges include the management of largely decentralized energy systems, harmonization of network codes on at least European level and a communication infrastructure for near-real-time services combined with high reliability. Therefore, we are developing a pan-European real time simulation Infrastructure for the validation of innovative approaches to system level automation based on innovative ancillary service provision.

Task
You are going to work on the implementation of a proper open-source simulation solver able to capture the right level of dynamics to describe interactions among different networks. For this purpose, the idea of adopting dynamic phasors as a main variable of energy system description will be adopted. The goal is to reach a time step in the order of milliseconds in real time. Such a simulation scenario will provide an advanced level of support for the analysis of the dynamics of large grids.
This solver will be part of a software needed to connect to our novel pan-European real-time simulation platform which creates the capability of capitalizing on the availability of computational resources across Europe to create a unified virtual simulation environment, enabling much larger scale energy system simulations than are currently possible.

Good knowledge of C++ is mandatory. Experience in power system simulation or operating systems is desired. The task can be focused either on the solver itself or its execution in a real-time Linux system depending on your background and interest.

Contact

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