Postdoctoral researcher in Virtual Power Plant for Smart Grids in H2020 RIA POSYTYF project

Key words: renewable energy, power converters, ancillary services, inter-area oscillations, small-signal/transient stability

Context:
Ecole Centrale Nantes (ECN) is fully involved in Renewable Energies (RE) technologies such offshore and onshore wind, wave and solar. *Dynamics of Smart Grids* team of LS2N-ECN tackles some important thematics of control of modern power systems. In particular, this team has, from 2020 to 2023, the lead of the H2020 POSYTYF project. This project is a Research and Innovation action of the EC focused on the development of an innovatory concept of Dynamic Virtual Power Plant (DVPP). The latter is supposed to allow an optimal portfolio of dispatchable and non dispatchable RE sources. Dynamics in the sense of stability assessment and control for RE sources participation to ancillary services are in the center of the project.

Research subjects:
DVPP are a collection of heterogeneous RE power generation sources (including solar, wind, bio, etc.) in a power park all with their own individual constraints (variable or dispatchable, limited in energy or power). One should investigate how to define and organize – both at transmission and distribution levels - the DVPP for ancillary services. At this stage, we envision control solutions that trade-off between optimality - when *centralized* approaches are taken - and resilience (i.e., maintaining a good level of performance in case of failure of one or more units of the DVPP) for *decentralized* approaches.

The candidate will:
- Participate to the brainstorming to define DVPP perimeter and structure
- Assess interactions between DVPP and other neighbor dynamics elements of the power system as well as between several DVPPs
- Implement and validate control solutions in hardware-in-the loop (HIL) benchmark
- Present and publish the main findings at peer-reviewed conferences and in top journals

Competences needed:
The candidate should have background and experience in power systems, especially in HIL based on power electronics benchmarking. Ideally, the candidate should have (up to 3 years) postoctoral research experience. Please provide the names and contacts of 2 or 3 referees (if possible, not exclusively the PhD advisors).

Schedule:
Recruitement: June 1st, 2020
Duration : 12months with possibility of 2 years extension
Work will take place in ECN, Nantes-France.

Contact:
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