

Industrial doctorate position available in Centrale Lille/L2EP and Red Eléctrica

ADOREd (Accelerating the Deployment of Offshore wind using Dc technology) is one of the largest industrial doctoral networks contributing to the decarbonization of electric power system via developing the most appropriate models and methods for a coordinated approach to offshore renewable connections. Six academic and 12 industrial beneficiaries will recruit and train 19 doctoral candidates performing research on topics spanning offshore wind, HVDC technology and grids and interactions between AC and DC systems.

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One industrial doctoral position will be carried out in the Ecole Centrale Lille (CLille)/L2EP (<https://l2ep.univ-lille.fr/en/>) (France) and will be employed part time by CLille and part time by Red Eléctrica – REDEIA (www.ree.es) (Spain).

This is a unique opportunity to study for an industrial doctoral degree in a network of wind power and power systems experts from academia and industry. We are therefore looking for high qualified and motivated candidates with the skills, background knowledge and enthusiasm to help the network make important research breakthroughs. The successful candidate will have consecutive employment in academia and industry (order can vary), for a total period of 36 PM. This may require that the candidate will have to move to another country during that period. The selected doctoral candidate will work the first 18 months in CLille/L2EP (France) and the next 18 months in Red Eléctrica (Spain).

- The appointed researchers can be of any nationality and must have the necessary academic skills and background (electrical engineering, power systems, power electronics, renewable energy, optimization, control systems) to make the success of a doctoral degree.
- Applicants are required to have completed Bachelor and Master studies before starting the work.
- On the date they start work (likely to be January – March 2023), researchers must not have lived in the country of the host organisation (see below) for more than 12 of the previous 36 months, must have less than four years' full-time equivalent research experience and must not have a doctoral degree. <https://change-itn.eu/vacancies/eligibility-criteria/>
- Candidates not fulfilling the previous requirement but interested in working with us are encouraged to contact us explaining the situation, as we may have other opportunities available.
- Researchers will be employed by the university and industrial partner for a total of 36 months (some months in the university and some in the company).
- The network offers the appointed researchers generous salaries (competitive salary plus allowances) and funding for technical and personal skills training and participation in international research events.
- Researchers will develop both theoretical and applied work, and will be in close contact to real applications.
- All researchers will participate in international secondments to other organisations in the ADORED network and in outreach activities with audiences beyond the research community.
- It is a requirement that network ESRs have an ability to understand and express themselves in both written and spoken English to a level that is sufficiently high for them to derive full benefit from the network training.
- Female candidates are especially encouraged to apply as women are underrepresented in this field of research.

The required skills for the phd position are as follows:

- Msc degree in electrical engineering, engineering, mathematics, physics or similar
- Background on power systems and/or power electronics
- Interest on simulation tools, such as Matlab+Simulink, PSCAD/EMTDC and Scripting in general

Applicants are asked to submit:

- Complete CV

- Copies of academic transcripts and degree certificates (Bachelor and Master or equivalent) in English
- 2 reference letters
- Letter of motivation, including the list of different ADORED vacancies (in CLille/L2EP, Red Eléctrica and/or other partner institutions) where the candidate is applying and the dates when he/she would be available to start working.
- Please submit your application at adored.phd@epmlab.eu no later than 30-11-2022

The assessment of the applicants will be made by Prof. Xavier Guillaud (CLille/L2EP, xavier.guillaud@centraledlille.fr) and Dr. Javier Renedo (Red Eléctrica, javier.renedo@ree.es). Information about the applicants may be shared with other partners from the ADORed consortium.

Vacancy & host organisation	Project title and overview
<p style="text-align: center;">A CLille/L2EP + Red Eléctrica</p>	<p>Stability of an islanded power system with a grid-forming VSC-HVDC link, an LCC-HVDC link and non-synchronous generation (WP3) Supervisors: Prof Xavier Guillaud (CLille/L2EP) and Dr Javier Renedo (Red Eléctrica)</p> <p>Objectives: All over the world, some projects are emerging in various islands to increase the share of renewable energy in the electricity mix. For the islands which are not too far from the shore, it is also possible to provide the energy with HVDC transmission. Given that these grids are, most of the times, quite small with a limited amount of power sources, these electrical power systems merge all the main difficulties to maintain the grid stability. This project aims to develop a theoretical approach to study the stability of these small systems subjected to various situations and a more practical part will be developed on the study case of the Balearic Islands (Spain) which will gather all the different elements.</p> <p>Specific objectives include:</p> <ol style="list-style-type: none"> 1. The grid-following and grid-forming controls will be tested to study the influence on the grid stability and also on the system strength; 2. An optimal share of these two types of control will be proposed; 3. The theoretical approach developed on a generic power system will be applied on a realistic model of the Balearic Island <p>Expected Results:</p> <ol style="list-style-type: none"> 1. Find the optimal share of grid-forming/grid-following control to maintain stability in a small island with various types and power for power electronic converters; 2. Definition of the short circuit ratio in a power system feed with 100% power electronic converters. Application to the stability of the LCC-HVDC link when connected to this type of systems; 3. Analysis and definition of a robust control of the new VSC-HVDC to guarantee its safe operation and the supply security of Balearic power system; 4. Conclusions on the feasibility of increasement of the share of renewable generation in the Balearic Islands. <p>Planned Recruitment: 18 months CLille/L2EP + 18 months Red Eléctrica</p>

Partner information

Centrale Lille has worked on the power electronic converters for many years but the application to the transmission system started in 2010. In these years, the activity was mainly focused on the stability studies of MultiTerminal DC grid. This work was in relation with some the European projects Twenties first, then Bestpath. Soon after, the work on modelling and control of large AC/DC power converters started with the MMC first and some alternate topologies such as AAC. The activities moved toward the stability study of AC system including a large proportion of power electronic converters. Most of the research projects are orientated on topic of grid forming control.

Beside this research activity, lots of industrial contracts have been developed with some French companies but also with various European TSOs.

Red Eléctrica (RE), a company of Redeia, is in charge of the transmission and operation of the electrical system in Spain. The main objective of Red Eléctrica is to guarantee the safe and continuous supply of electricity throughout Spain, and to develop a reliable transport network to support social progress. The company was funded on 1985 and it was the first company in the world exclusively involved in transmission and operation of the electrical system.