Techno-economic Assessment Innovative Power Electronics Systems (H/F)

General Scope

Medium-to-low voltage conversion systems are required to interface medium-voltage AC (MVAC) distribution grids to low-voltage systems. Inside this scope, we can distinguish two low-voltage (LV) systems that are directly connected to the MVAC distribution grid: low-voltage alternative-current systems (LVAC), such as conventional households, offices, and industries, and low-voltage DC (LVDC) systems, such as photovoltaic and wind onshore farms, bulk energy storage systems, data centers, and fast charging stations for electric vehicles. While MVAC/LVAC conversion is handled with conventional distribution transformers, MVAC/LVDC systems require more complex power-electronics-based conversion.

Today, conventional MVAC/LVDC conversion systems operate with an efficiency somewhere between 94-96%. Despite seemingly highly efficient systems, there is an urge to improve MV/LV conversion efficiency to curb the electricity demand on expanding applications such as data centers and EV fast charging stations and to decrease production losses in wind and PV farms: every tenth of % counts at a large scale. Increasing the electricity efficiency of end-use sectors is a crucial pillar of a successful energy transition.

Mission Scope

In this internship, you will be led to work with the SE Secure Power CTO innovation team on power conversion architectures for data centers. We want you to work with us in proposing innovation for scaling data centers' capacity to meet the demand of digital lifestyles while focusing on optimizing energy consumption, reducing carbon footprint, and aiming for carbon-free operation.

We want to offer you the best opportunities to leverage your skill sets to begin your career:

- Your learning is our priority. For this reason, you will be given varied and responsible tasks in a global environment.
- We remain at eye level and give you freedom and room for creativity - and we don't get scared when real innovation emerges.
- You will work in an international environment with friendly and competent people from different backgrounds.
- Work with meaning! SE is an Impact company with a sense of responsibility and sustainability. Join us to create a green future.

Mission Objective

You will integrate our team to help us develop a detailed framework to evaluate power electronics technological innovations through a techno-economic and life cycle assessment. Your mission will be:

- To develop reliability models of power electronics converter components.

- To develop stochastic reliability simulation of power converters.
- To assess the economic performance of innovative power electronics systems and benchmark it to conventional architectures.
- To assess technical aspects of innovative power electronics systems and identify technological paint points.

Candidate Profile

You are in the last year of a master's program at a major engineering school in the field of electricity with a solid background in power electronics with the following set of skills:

- You know how to assess losses in a power electronics converter and how to model its thermal behavior.
- You have a base knowledge of power electronics reliability and are eager to dive deep into that field.
- You have a base knowledge of estimating the Net present value of an asset.
- You can structure and plan activities pragmatically, autonomously, and efficiently.
- You are comfortable with object-oriented programming.
- You are creative and know how to communicate effectively.
- You have full professional English proficiency.

Practical Information

You will be located at Schneider Electric's Technopole R&D site in Grenoble. The site is a showcase for Schneider Electric's know-how and a reference R&D center for the Energy business on a global scale.

If you are interested in this offer, send an e-mail with your resume, cover letter, and academic record to rafael.medeiros2@se.com and llknur.colak@se.com.