

## 17J009 - Internship Proposal

### ***Title: Design of a hydrogen storage vessel reactor***

EIFER (European Institute for Energy Research) was established in 2001 as collaboration between the Karlsruhe Institute of Technology (KIT) and Electricité de France (EDF). Today, EIFER has an international team of more than 100 researchers.

One focus of EIFER's activities is on hydrogen and fuel cell technologies, from carbon free production via water electrolysis to different applications of hydrogen and fuel cells, including stationary production of electricity, industrial applications and hydrogen mobility. In particular, hydrogen used in fuel cell vehicles can enable to decarbonize the transport sector and reduce local pollution in cities. There are specific constraints on the hydrogen (purity, pressure, temperature) which requires the development of a dedicated refueling infrastructure.

The hydrogen team of EIFER is currently looking for a student in the scope of a research and development project on hydrogen refueling infrastructure.

### **The assigned tasks involve**

- ▶ A literature review of the state-of-art
- ▶ Support the EIFER team and his partners to design a hydrogen storage vessel to be used in the context of hydrogen mobility. The design of the vessel will take into account technical constraints as well as economic considerations.
- ▶ Modelling of a hydrogen storage vessel with a CAD software. The model will include different aspects of the vessel. Particular attention will be paid to mechanical and thermal aspects.
- ▶ Propose practical solutions to implement the production of the vessel. Different production technologies will have to be compared and the technical-economic optimum will have to be selected.
- ▶ Perform a technical-economic assessment of the vessel developed compared to competing technologies. A TCO analysis will be performed, based on the CAPEX and OPEX of the vessel developed.
- ▶ Writing a feedback report on the activities
- ▶ Contributions to writing deliverables of the project
- ▶ Depending on the time required to perform these tasks and the success of the previous analysis performed, the student could be involved in the realization of one prototype.

### **Required qualifications / skills / interests**

The position is aiming at students in mechanical/electrical engineering. The following skills are mandatory:

- ▶ strong knowledge in mechanical sciences
- ▶ strong knowledge in at least one CAD software (Autocad or equivalent)
- ▶ good knowledge in thermodynamics and energy sciences
- ▶ fluent in English and either German or French
- ▶ knowledge of hydrogen technologies would be of value but is not mandatory
- ▶ ability to understand the tasks assigned, to propose solutions, to work independently

### **Conditions**

- ▶ Duration: 6 months, starting at soon as possible
- ▶ Location: EIFER, Emmy-Noether-Str. 11, 76131 Karlsruhe, Germany
- ▶ Working hours: 39.5 hours per week
- ▶ Monthly compensation: 450 €

### **Contact**

If you want to join a highly motivated research group, please forward your application including all relevant information (curriculum vitae and cover letter, in French or English) to [jobs@eifer.org](mailto:jobs@eifer.org).

Please refer to the offer **number 17J009!**

For additional information concerning the work please contact: David Colomar, [colomar@eifer.org](mailto:colomar@eifer.org), Tel. +49 (0) 721/6105-1719.