

Job title	PhD Position in Hydrogen Energy Simulator of a hydrogen based ecosystem
Job type (PhD, Post-doc, Engineer)	PhD Position
Contract duration (months)	36 months
Qualifications (Master degree, PhD...)	Master Degree
Job hours (full time/ part time)	Full time
Employer	UBFC – Université de Franche-Comté
Host Laboratory	FEMTO-ST (Energy Department) / DRIVE (EMIE-MEEP Group)
URL Host Laboratory	www.femto-st.fr , www.isat.fr/recherche/equipe-epce
Address Host Laboratory	FEMTO-ST, 13 rue Thierry Mieg, 90010 Belfort Cedex, France Institut Supérieur de l'Automobile et des Transports, 49 rue Mademoiselle Bourgeois, BP 31, 58 027 Nevers cedex, France
Job description	<p>Context :</p> <p>The PATH (Pave the way To Hydrogen energy) project aims to contribute to the development of rational ecosystems based on hydrogen energy, which are technically, economically, socially and environmentally sustainable, at a regional scale. It targets three objectives: the development of materials for the development of a high temperature reversible electrolysis / fuel cell cell (WP 1), the development of a simulator of hydrogen ecosystems (WP 2), the evaluation of the profitability and the value generated by these technologies based on case studies in the Bourgogne Franche-Comté territory (WP 3). The PhD subject is a contribution to the WP2.</p> <p>The SHARPAC group of the Energy department of FEMTO-ST institute and EMIE-MEEP group of DRIVE laboratory have a long experience on the development of models of the hydrogen and hybrid systems components for transport and stationary applications. The Computer Science Department of FEMTO-ST has developed skills in optimization of energy system design. In this thesis, the final objective is to have a simulator allowing the evaluation of hydrogen ecosystems</p>

	<p>which include aspects from production, and transport, up to use in mobility alone or in synergy with other domains, interfacing different applications (fleet of heavy vehicles, light vehicles, hydrogen refueling stations, production of green hydrogen, centralized or distributed on consumption sites, coupling with stationary applications, etc.) according to scenarii co-developed with the partners of WP3 of the project. Including the basic energy concepts, the simulator will also make it possible to include economic, ecological and sustainability aspects by combining life cycle analysis and well-to-wheel balances. It will thus constitute a tool to help with the prescription and design of ecosystems allowing the emergence of a hydrogen sector in an approach that is as global as possible but adapted to local contexts.</p> <p>The following steps are proposed:</p> <ul style="list-style-type: none"> - Data mining and collection of models available in the research groups - Development of missing component models - Development of life cycle analysis for prioritized components - Aggregation of components in the simulator - Sizing of the system components - Use of the simulator on the selected scenarios - Optimization of competing scenarios taking into account environmental impact, total cost of ownership, etc. and probable evolution of components <p>Throughout the thesis, an exploitation plan of the results will be determined, in connection with the results of the European Virtual FCS¹ project, in particular according to the following options: open source distribution, pre-maturation of commercial exploitation, via the license transfer or the creation of a spin-off.</p> <p>The PhD work will be carried out in both laboratories, FEMTO-ST, in Belfort, and DRIVE, in Nevers. The share of the time spent in each laboratory will be defined according to the advancement of the work. It should start in Belfort.</p>
Supervisor(s)	<p>Prof. PERA Marie-Cecile (marie-cecile.pera@univ-fcomte.fr), Prof. LE MOYNE Luis (luis.le-moyne_isat@u-bourgogne.fr), Dr. DESCHINKEL Karine (karine.deschinkel@univ-fcomte.fr)</p>
Candidate profile	<p>Master Degree in Electrical Engineering or in Applied Computer Science Fluent English Interest in interacting with researchers in economy</p>

¹ Virtual FCS : projet européen Virtual & physical platform for Fuel Cell System development

	Interest in carbon free technologies
Keywords	Hydrogen energy, hydrogen ecosystem, sizing, modeling.
Application deadline	15/05/2021
Starting Job	01/10/2021
Application <i>Depending on the type of position</i>	<p>PhD Position</p> <p>Please send the following documents (all in one PDF file) by e-mail to "indicate contact email" :</p> <ol style="list-style-type: none"> 1) For EU candidates: Copy of your national ID card or of your passport page where your photo is printed. For non-EU candidates: Copy of your passport page where your photo is printed. 2) Curriculum Vitae (1 page). 3) Letter of motivation relatively to the position (1 page). 4) Copy of your Master degree and/or Engineer degree if already available. 5) Copy of your final marks and ranks. 6) Coordinates of reference persons (maximum 3, at least your master thesis supervisor): Title, Name, organization, e-mail. <p>If you have questions regarding the application, please contact the supervisors.</p>