Demande de Publicité Internationale
Recrutements prévus dans les Projets ISITE-BFC
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Job title	An economic analysis of decentralised electric systems incorporating hydrogen-energy
Ref	Complété par UBFC
Date de mise en ligne souhaitée	
Job type (PhD, Post-doc, Engineer)	PhD thesis
Contract duration (months)	36
Qualifications (Master degree, PhD…)	Master degree
Job hours (full time/ part time)	Full time
Employer	UBFC – Université de Franche-Comté
Host Laboratory	FEMTO-ST/RECITS CRESE NB : the doctoral student will belong to the **SEPT doctoral school**
URL Host Laboratory	https://www.femto-st.fr/fr https://crese.univ-fcomte.fr/fr
Address Host Laboratory	FEMTO-ST, 15B avenue de Montboucons, 25030 Besançon Cedex, France Rue Thierry Mieg, 90010 Belfort Cedex, France. CRESE, 30 Avenue de l'Observatoire, 25009 Besançon, France.

Job description	The low-carbon energy transition requires a deep transformation of energy systems in order to support the development of renewable but intermittent energy sources. Two energy vectors appear central in that matter: electricity and hydrogen. The access to energy is currently designed through a centralised management of energy transmission network with flexibility and balancing supply relying on mechanisms implemented by the transmission system operator. However, the large introduction of variable renewable energy sources (VRES) in the energy mix, as well as the implementation of decentralised energy systems (the so-called "micro-grids", which are not always connected to the power grid) increasingly require to think about a local management of energy systems and their flexibility. Hydrogen which allows storing energy on a large scale and for long periods of time, appears as a promising energy vector in order to provide stability and flexibility of decentralised power systems. By contributing to a further development of VRES (through energy storage and supply of flexibility), and by providing an alternative to fossil fuels, hydrogen-energy may be a mean to meet social demand for low-carbon energy systems. This is precisely the objective of the ISITE-BFC PATH project to analyse the technical feasibility and the economic as well as environmental and social interest of such energy systems incorporating hydrogen-energy, especially in the Burgundy and Franche-Comté region. A "hydrogen territory" label has been given to this latter, which resolutely intends to become a leader in that matter. Thus it appears as a relevant location for investigating how efficiently hydrogen could be introduced in energy systems, with experiments that might be replicable in other locations. This geographical context as well as the multidisciplinary orientation of the PATH project, that combines skills in engineering sciences and economic and social sciences, constitute the framework of the PhD work. The doctoral research program will aim at analysing the value associated to energy storage and provision of flexibility for electricity networks, through energy production and distribution devices incorporating hydrogen-energy within the framework of a decentralised territorial perspective. More precisely, the analyse will have to consider the value associated to the supply of local flexibility services for electricity (which can either be valued through central mechanisms or through sharing or bilateral exchanges between local energy systems), the sale of green hydrogen, the avoided curtailment of VRES (thanks to storage with hydrogen), as well as the increasing running time of electric utilities that are a source of economies of scale. All have to be taken into account in order to assess the value of incorporating hydrogen into energy systems at a local level. Moreover, the benefit associated to avoided carbon emissions will have to be included in the assessments, and, beyond the sole carbon emission abatement cost, a broader perspective is expected to consider the increased value and non-value of such devices through a qualitative analysis of others economic, environmental and social effects. Thus such an approach could also consider the impact of mining related to raw materials that are used in those energy systems. On the basis of the empirical observation of existing local energy systems using hydrogen-energy, especially on the French territory, a study of opportunities and limits of such devices in comparison with alternative systems of energy provision will be carried out. Then a twofold economic modelling will be proposed : 1) An innovative LCOE model (Levelized Cost of Energy, which corresponds to the overall cost including CAPEX and OPEX, divided by the total amount of energy produced over the whole equipment lifespan) able to integrate a broad set of variables of an economic, environmental and social nature ; 2) A microeconomic model aiming at analysing investment decisions under various assumptions related to constraining

	or incentive mechanisms, sales of products and the value given to knowledge and skills sharing and diffusion. For the realisation of the PhD, the doctoral student will be hosted both by the FEMTO-ST/RECITS and CRESE research teams, that are in the field of social sciences. He/she will belong to the SEPT doctoral school in UBFC.
Supervisor(s)	Rodet-Kroichvili, Nathalie (nathalie.kroichvili@utbm.fr) Bertrand, Vincent (vincent.bertrand@univ-fcomte.fr)
Candidate profile	Economist or engineer with a master degree in economics Skills in modelling Good knowledge of energy and electricity systems An experience of qualitative research will be appreciated and skills in French language are required for interviews with local actors implementing energy systems based on hydrogen in French regions.
Keywords	Energy economics, VRES (Variable Renewable Energy Sources), hydrogen, sustainable development, flexibilities for electricity systems
Application deadline	15 June 2021
Starting Job	Fall 2021
Application *Depending on the type of position*	**PhD Position** Please send the following documents (all in one PDF file) by e-mail to "indicate contact email" : 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. If you have questions regarding the application, please contact the supervisors. **OR** **Post-doc position** Please send the following documents (all in one PDF file) by e-mail to "indicate contact email" : 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 (may include hyperlinks to your ResearchID, Research Gate Google Scholar accounts).

	3) Detailed list of publications (may include hyperlinks to DOI of publications). 4) Letter of motivation relatively to the position (Cover Letter) in which applicants describe themselves and their contributions to previous research projects (maximum 2 pages) 5) Copy of your PhD degree if already available. 6) Coordinates of reference persons (maximum 3, at least your master thesis supervisor): Title, Name, organization, e-mail. If you have questions regarding the application, please contact the supervisors.