

Research Fellow in modelling and optimisation of energy systems with thermal energy storage - School of Chemical Engineering - 103070 - Grade 7

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Company: University of Birmingham

Location: United Kingdom

Category: life-physical-and-social-science

Summary

We are recruiting a highly motivate researcher to join the teams at the University of Birmingham and projects funded by EPSRC and Horizon Europe (EPSRC Supergen Energy Networks Hub; THUMBS UP). The researcher will join the School of Chemical Engineering, the Birmingham Energy Institute, and Birmingham Centre for Energy Storage.

Deep emission reduction is ubiquitously associated with the need of development and adoption of efficient zero-carbon energy technologies and thermal energy storage, particularly in local multi-energy systems (industrial clusters and energy districts). This is exemplified by national and international strategies toward decarbonization.

The researcher is expected to contribute to develop and develop of models, based on existing and new simulation environments, for simulation and tecno-economic optimization of multi-energy systems with zero-carbon technologies (Heat pumps, PV, Power-to-X) and energy storage.

The post holder will work closely in collaboration with academics at the University of Birmingham, project partners and industrial partners, and mainly contribute to the development, application, testing and validation of models. The modelling results will also contribute to the development and optimization of real-life multi-energy systems in the UK and overseas.

The research and development carried out by the researcher will ultimately results in new scientific knowledge across relevant communities, know-how and intellectual property,

toward net-zero

Main Duties

Develop of models, based on existing and new simulation environments, for simulation of multi-energy systems with other zero-carbon technologies as well as thermal energy storage

Implement and test the models in real environments

Perform robust techno-economic analysis and optimization of multi-energy systems

Collect, analyse and study the impact of zero-carbon technologies and energy storage on energy demand and energy generation of multi-energy systems (industrial clusters, energy districts, etc)

Present research outputs, for example at conferences, workshops, and project review meetings

Provide guidance as required to support staff and any students who may be assisting with the research

Promotes equality and values diversity acting as a role model and fostering an inclusive working culture.

Person Specification

First degree in the an area of research within energy systems, or energy processes & technologies, or energy storage and normally, a higher degree relevant to research area or equivalent qualifications (in relevant field of science or engineering, for example: energy engineering, mechanical/chemical engineering, electrical engineering, computer science or discipline closely related to the main duties)

A proven track record in energy systems modelling and techno-economic analysis of energy systems and technologies

A proven track record and demonstrable proficiency in high-level programming for simulations and optimization of energy systems (. Python, Matlab, Modelica, Julia, EES Engineering Equation Solver, or other similar)

Understanding and experience with techno-economic optimization techniques (. mixed integer linear programming, multi-objective optimization, stochastic optimization, or other

similar)

Track record of academic publications, proven delivery of project outcomes and papers that are recognised within the field

Strong communication skills and ability to work in a diverse, international and cross disciplinary research and development environment

Knowledge of the protected characteristics of the Equality Act 2010, and how to actively ensure in day-to-day activity in own area that those with protected characteristics are treated equally and fairly

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