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| Lead institution: Imperial College London | |
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| Co-supervisor: | Co-supervisor department: |
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| Recipient: PhD student / PDF (delete as appropriate) | For PhDs - type: Full / Sandwich / Joint (delete as appropriate) |
| Project title: Modelling sustainable roles for gas technology in industry, transport and building applications | |
| Research theme area: High efficiency power generation with gas / Gas-fuelled transport / New applications for gas / Infrastructure and systems. (Delete as appropriate). | |
| <p>Aims</p> <p>The aim of this post-doc position is to train a future leader in energy systems modelling, with a focus on the role of gas technology in sustainable energy systems in the sectors of industry, transport and buildings. The position will lead development of key modules in the SGI energy systems model.</p> | |
| <p>Objectives</p> <p>The Sustainable Gas Institute (SGI) at Imperial College London is building a new global energy systems model, using a technology-rich simulation approach to construct pathways of plausible energy system transitions over long time horizons. This model has been designed to bridge the gap between the system level and the engineering level, based on the observation that system level studies are often too crude in engineering detail to be credible, and pure engineering-economic studies tend to focus on specific technologies and ignore their interaction with the broader system. The SGI model strives to overcome that gap by providing credible engineering characterisation within a systems framework. Once complete, it will be applied to consider the role for gas technology (though all energy vectors will be represented) in sustainable energy systems, particularly as it relates to climate change mitigation.</p> <p>This multi-disciplinary PDRA position will work within the team of energy systems modellers at the SGI to formulate and build the end-use sector modules (industry, transport, buildings, agriculture) of the overall model. These will be designed to integrate with upstream and energy conversion modules being produced by other team members. The end-use sectors are particularly challenging, and exemplify the many challenges in energy systems modelling, where sectors do not lend themselves to compact representation in a model, and therefore characterising them well is a significant research challenge.</p> <p>The primary objectives and roles of the position are to;</p> <ul style="list-style-type: none"> - undertake comprehensive rapid evidence base reviews of the state-of-the-art in modelling technology investment and asset operation in end-use sectors, in collaboration with external organisations such as the IEA, EIA and Kapsarc. | |

- formulate end-use sector modelling approaches that are novel, technology-rich, defensible and consistent with the broader SGI systems modelling framework.
- implement sector models in an appropriate programming language. Models must be high quality and well coded/structured, to a level where open-sourcing would be plausible.
- write thorough documentation with the ability to stand up to independent peer review.
- publish methodologies and results in high-impact peer-reviewed journals.
- present research outputs at conferences, meetings, events, and provide input to brief papers and SGI white papers.
- play a constructive role in the modelling team, providing input to initiatives outside their area of research, and aiding collaboration with external organisations.

This project would be well-suited to a highly quantitative individual with a 1st-class degree and PhD in engineering, science or mathematics. Programming/scripting skills (ideally Python, C or C++) will be beneficial alongside excellent communication. The successful applicant will join a team of leading energy systems modellers with opportunities for collaboration worldwide.