JOB TITLE: RESEARCH ASSISTANT/ASSOCIATE IN THE ECONOMICS AND POLICY OF HEAT DECARBONISATION FOR THE ENERGY POLICY RESEARCH GROUP (FIXED TERM)

REPORTS TO: ASSISTANT DIRECTOR, ENERGY POLICY RESEARCH GROUP

Background

We are looking to appoint a Research Associate at Cambridge Judge Business School (CJBS) within the economics and policy subject group. The Research Associate will support a UKRI-funded research project called HUMAN (Hydrogen infrastructure Uncertainty MANangement for heat decarbonisation).

The goal of the project is to provide the first systematic analysis on the cost of uncertainties related to the hydrogen-led decarbonisation of heat and its interaction with the power grid to derive resilient and least-regret policies. To facilitate this analysis, we propose the development of a series of innovative tools and energy systems modelling enhancements. The research outputs, apart from their expected scientific impact, will aid decision-making in the gas and electricity industry as well as inform government policy decisions and develop new business models.

Sustainable decarbonisation pathways require uncertainty-resilient policies. These policies can be informed by acknowledging proactively the uncertainties inflicted by technology performance, volatility in heat demand and socio-economic fluctuations. With the power sector becoming increasingly reliant on intermittent renewable sources and the Government’s commitment to "Net-Zero" by 2050, the role of hydrogen towards heat decarbonisation and the related uncertainties need to be urgently explored. The project considers strategic and operational decisions related to the deployment of a hydrogen-led system and its interaction with the power grid across spatial and temporal scales. Employing the tools developed within the project the optimal mix of electrification and hydrogen-based decarbonisation of heat will be explored at a spatially explicit UK-wide level. Using novel uncertainty modelling methods, the impact of uncertainties related to the heat sector and the hydrogen production technologies will be analysed to derive uncertainty-informed transition pathways. Finally, HUMAN proposes to disseminate an open-source platform with user-friendly interface to enhance interpretability among energy policy and modelling practitioners and enable the investigation of alternative uncertainty-informed scenarios for heat decarbonisation.

The successful candidate will be based within the Energy Policy Research Group (EPRG) at Cambridge Judge Business School. This project will complement other EPRG research into deep decarbonisation in energy-intensive industries, electricity, heat, and transport. Find out more about EPRG: www.eprg.group.cam.ac.uk

The research is being conducted as part of a comprehensive multi-scale modelling approach.
Cambridge leads the work package on market and regulatory frameworks. Building on findings from the rest of the project, we aim to understand:

- competition and complementarities between different sources of flexibility in a deeply decarbonised UK energy system by 2050;
- efficient institutional design for hydrogen and conventional gas transmission networks and wholesale commodity markets that would give rise to efficient (investment and operational) price signals. All existing whole energy systems models traditionally focus on engineering aspects and they don't take into account institutional policy and regulatory frameworks, eg how to design an economic system that would support 'optimal' solutions coming out of the large-scale engineering whole system models;
- and tax-based vs quantity-based solutions or a combination of both to limit GHG emissions that would support technology neutral investment in decarbonisation of the UK heat sector.

Cambridge will also support the modelling work being carried out by our project partners at University College London (UCL) in two key aspects:

1. **Stakeholder specific regret criteria**
   The existing literature explores the decarbonisation of heat under a centralised decisionmaker scope. However, different stakeholders have different and possibly conflicting regret criteria, eg electricity network reinforcement versus repurposing the existing gas network. We will perform studies to address this gap in the literature focusing on competition between hydrogen and electricity markets.

2. **Expert elicitations of key parameter and model uncertainties**
   We will carry out more detailed expert elicitations (see Morgan, PNAS, 2014) to help inform the reliability and robustness of the key input parameters used in the analysis (economic and techno-economic energy systems modelling) being conducted in HUMAN. We will conduct expert elicitation with around 20 subject matter experts to improve the key parameters input into models developed by UCL and stakeholder-specific criteria. We will carry out these detailed interviews with leading experts from academia, industry, non-government organisations and government.

A PhD in Economics (energy economics, applied economics, etc), Operations Research, Systems Engineering or other relevant discipline (eg public policy etc) is essential. Additional knowledge or background in adjacent areas is not necessary but would be desirable. In addition, good writing skills and attention to detail are important to complete project tasks. The candidate will work closely with researchers at UCL, but they should be able to work independently and may also contribute to other aspects of the work of EPRG.

Our EPRG research team have broad expertise in economics, technology policy and political science. Our core research discipline is applied economics, within a framework that encourages collaboration between experts from different academic traditions, drawing on insights from engineering, political science, and law.

**Main responsibilities**

- The Research Associate is expected to contribute primarily to a programme of work being undertaken as part of the HUMAN project, funded by UK Research and Innovation (UKRI). Given the
nature of the cross-cutting work, we will be involved in all aspects of the project working closely with colleagues at UCL.

- The roles holder is expected to conduct a series of expert elicitations on hydrogen-led decarbonisation with relevant stakeholders and experts from government, industry, non-governmental organisations (NGOs) and academia.
- The project also has funding to conduct. This element will be led by our colleagues at UCL, but we will contribute to the design and analysis.
- The research will build on our existing work and expertise within EPRG and the role holder will be expected to contribute to other aspects of EPRG’s work programme, participate in our weekly seminars, publish in our working paper series, and engage with other researchers at EPRG and CJBS more widely. The researcher is expected to actively engage with the project partners at UCL and, in particular, to work closely with relevant PDRAs and researchers.

The person

The ideal candidate should have the following qualities, skills, and attributes. You are asked to provide a CV and a covering letter demonstrating how your own experience meets these requirements:

- PhD in Economics (energy economics, applied economics etc), Operations Research, Systems Engineering or other relevant discipline (eg public policy etc).
- Strong quantitative skills, particularly in techno-economic modelling.
- Knowledge of energy economics and policy and basic knowledge of operations research (eg equilibrium models of energy markets).
- Excellent writing skills and attention to detail.
- Able to work independently and as part of an interdisciplinary and collaborative project.
- Driven and committed, demonstrating initiative and self-motivation.
- Good time management and planning skills with an aim to produce relevant academic papers in leading international academic journals.
- Training in applied econometrics and demonstrated ability to design, conduct, analyse and write up survey research.
- Familiarity with UK and European energy policy including electricity and heat, gas and carbon markets, decarbonisation pathways, political economy, trade and competitiveness considerations.
- Familiarity with uncertainty and/or expert elicitations.
- Knowledge of one or more pathways to heat decarbonisation or residential buildings sector.

Benefits

This is a full-time position working 37 hours per week. There will be a six-month probationary period. Holiday entitlement is 33 days per annum plus eight days of public holidays. The salary will be in the range £32,348-£42,155 per annum.
The full incremental salary range for the position is advertised in order to demonstrate the progression for the Grade. In the majority of cases appointments will be made at the Grade minimum; only in very specific exceptional circumstances can a higher salary be offered.

This is a fixed term role for two years in the first instance.

The University of Cambridge comprises more than 150 departments, faculties, schools, and other institutions, plus a central administration and 31 independent and autonomous Colleges. It is one of the world's oldest and most successful universities, with an outstanding reputation for academic achievement and research.

With excellent benefits, extensive learning opportunities and a stimulating and attractive environment, the University of Cambridge is a great place to work. Our employees are eligible for a wide range of competitive benefits and services. We give them access to numerous discounts on shopping, health care, financial services, and public transport. We also offer final salary pensions and tax-efficient bicycle and car lease schemes.

We have two nurseries and a holiday play scheme to help support those with childcare responsibilities and we offer various types of family-friendly leave to aid employees' work-life balance. In addition, we operate a number of initiatives to promote career development, health and well-being.

Further details can be found at www.admin.cam.ac.uk/offices/hr/staff/benefits. There is also a range of information about living and working in Cambridge at www.jobs.cam.ac.uk.

Application arrangements

To submit an application for this vacancy, please search for this position on the University's Job Opportunities website at www.jobs.cam.ac.uk and click on the "Apply online" button at the bottom of the relevant job description. This will route you to the University's Web Recruitment System, where you will need to register an account (if you have not already) and log in before completing the online application form.

The closing date for applications is 7 November 2022.

Applicants are required to provide details of two referees. These will not be contacted unless the applicant is shortlisted.

Equality of opportunity at the University

The University of Cambridge is committed to a proactive approach to equality, which supports and encourages all under-represented groups, promotes an inclusive culture and values diversity. Entry into employment with the University is determined by personal merit and by the application of criteria required for the post. No applicant for an appointment or member of staff will be treated less favourably than another on the grounds of sex (including gender reassignment), marital or parental status, race, ethnic or national origin, colour, disability (including HIV status), sexual orientation, religion, age or socio-economic factors.

The University has various diversity networks which help it to progress equality; these include the Women's Staff Network, the Disabled Staff Network, the Black and Minority Ethnic Staff Network and the Lesbian, Gay, Bisexual and Transgender Staff Network.
Information if you have a disability

The University welcomes applications from individuals with disabilities and is committed to ensuring fair treatment throughout the recruitment process. Adjustments will be made, wherever reasonable to do so, to enable applicants to compete to the best of their ability and, if successful, to assist them during their employment.

We encourage applicants to declare their disabilities in order that any special arrangements, particularly for the selection process, can be accommodated. Applicants or employees can declare a disability at any time.

Applicants wishing to discuss any special arrangements connected with their disability can, at any point in the recruitment process, contact a member of Cambridge Judge Business School's HR team who are responsible for recruitment to this position by email on hr@jbs.cam.ac.uk.