THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF SCIENCE & ENGINEERING

SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

DIVISION OF ELECTRICAL & ELECTRONIC ENGINEERING

RESEARCH ASSOCIATE IN POWER SYSTEMS ENGINEERING – EPSRC TERSE PROJECT

VACANCY REF: S&E-13407

Salary: Grade 6 £32,236 to £39,609 per annum (according to relevant experience)

Hours: Full Time

Duration: Fixed term 2 years from commencement of contract

Location: Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:
Name: Dr Mathaios Panteli or Prof Pierluigi Mancarella
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Background (Host Organization):

The University of Manchester lies in the heart of Manchester and has been created by bringing together the Victoria University of Manchester and UMIST, two of Britain's most distinguished universities, to create a powerful new force in higher education. The School of Electrical and Electronic Engineering has over 70 academic staff and is one of the largest schools of this type in the country, a particular strength of the School being power engineering. In the last Research Excellence Framework REF2014 (an independent assessment of university research covering the period 2009-14) the School was ranked fourth for research power in the UK.
The School of Electrical and Electronic Engineering (EEE) at the University of Manchester has for a long time been pioneering in the field of power engineering and boasts the longest running MSc course on Electrical Power Systems Engineering in the UK which has been delivered continuously since 1963. The Power and Energy Division has a reputation as an international leader in high-voltage testing and power systems innovation. It collaborates very closely with many industrial partners in the energy networks sector and hosts the National Grid Power Systems Research Centre, home to a multi-million research funded by industry, the UK government, and the EU. More than 20 academics and over 120 PhD students, post-doctoral researchers and visitors contribute to the world-leading and innovative output from the Power and Energy Division, with a multi-million research portfolio.

MANCHESTER 1824
The University of Manchester

Overall Purpose of the Job:

Applications are invited for a postdoctoral research associate for an outstanding and ambitious engineer to undertake research within the recently awarded £1.2m "Techno-Economic framework for Resilient and Sustainable Electrification (TERSE)" project, funded by the Engineering and Physical Sciences Research Council (EPSRC) through the Global Challenges Research Fund (GCRF). GCRF is a £1.5 billion fund announced by the UK Government to support cutting-edge research that addresses the challenges faced by developing countries. The TERSE project is led by The University of Manchester and it is a multi-disciplinary consortium of lead Universities from United Kingdom, China and Malaysia.

The key ambition of the TERSE project is to develop an innovative, integrated techno-economic framework for supporting decision-making and planning of sustainable, cost-effective and resilient energy infrastructure in developing countries and beyond. Within this context, you will work on the design and development of novel distributed energy resources (DER) solutions (such as on grid-connected and off-grid microgrids and community-based energy systems) for providing energy network sustainability as well as resilience to natural hazards, particularly in rural and isolated regions in developing countries. You will also develop innovative stochastic optimization models under uncertainty for network and DER portfolio planning and adaptation based on cost, sustainability and resilience multi-criteria analysis. Uncertainties in these challenging environments include for example the frequency and severity of natural (e.g. climate change-driven) hazards, local resources availability, DER options and demand growth. The developed tools will be applied and validated in identified regions in China and Malaysia, in close collaboration with and strong support by the local academic and industrial project partners. The ultimate goal will be to provide engineering recommendations for resilient and sustainable network planning, design and operation based on techno-economic factors that consider the needs of the local project partners and communities, while being of generic applicability and validity to developing countries worldwide.

You will be based in the Power and Energy Division of the School of Electrical and Electronic Engineering at The University of Manchester.

Key Responsibilities, Accountabilities or Duties:

The range of duties will include:

- Develop simulation models of DER options, with application to wider network planning (including network infrastructure and DER solutions) in rural regions of developing countries.
- Apply simulation models of natural hazards to evaluate the vulnerability of the designed energy networks to such disastrous events.
- Develop innovative stochastic optimization models for integrated sustainability and resilience planning under uncertainty.
- Apply and validate the designed simulation models on the identified case studies in China and Malaysia.
- Provide engineering recommendations for resilient and sustainable network planning, design and operation, with application on developing countries and beyond
- Communicate material of highly technical nature with the project partners and the wider research community.
- Prepare and present reports on research progress and write up research work for publication.
- Attend and contribute to relevant meetings and events, both in UK and worldwide

- Translate knowledge of advances in the subject area into research activity
- Use creativity to analyse and interpret research data and draw conclusions on the outcomes.
- Plan and manage research activities in collaboration with the project partners
- Build internal and external contacts and participate in research networks for the exchange of information and to form relationships for future collaboration.
- Provide suitable support to postgraduate and undergraduate research students as appropriate

Post holders are required to familiarise themselves with the University's Equality and Diversity policies and to actively support these wherever possible.

Person Specification

You should use your application to clearly demonstrate with evidence how you meet the following aspects of the person specification.

Essential:

- Possess, or be about to obtain, a PhD in Power Systems Engineering or have equivalent industrial research experience.
- Have demonstrable experience in the development of DER and network infrastructure solutions for sustainability and resilience planning
- Demonstrate technical proficiency in the development of decision-making and stochastic optimization techniques under uncertainty, as well as experience in relevant software packages
- Possess adequate understanding of techniques for evaluating and quantifying the impact of natural hazards and extreme weather on power systems resilience
- Have a strong publication record in internationally peer-reviewed journals and be able to write scientific reports and research papers.
- Be able to efficiently present research findings at national and international meetings and conferences.
- Possess excellent oral and written scientific communication skills.
- Demonstrate a flexible approach to working, with the willingness to travel and participate in both UK and international events.
- Have the ability to take initiative and work independently
- Demonstrate the ability to meet strict deadlines.

Desirable

Experience in the following areas is desirable:

- Energy system planning in developing countries
- Mathematical/statistical modelling of uncertainties