



Senior Research Fellow

Centre for Sustainable Cooling

EPS - Chemical Engineering

Full-time

Grade 9





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Why cooling?

In a rapidly warming world, cooling underpins every aspect of a functioning society including access to safe and nutritious food, effective vaccines and medicines, comfort and productivity in homes and workplaces, effective and efficient operation of data centres. Yet, as of 2022, 1.2 billion rural and urban economically challenged communities across the globe are at high risk due to lack of access to cooling. Today, 12% of the total food produced that could feed an estimated 1 billion people globally is lost due to lack of effective refrigeration and 25% of vaccines reach their destination with degraded efficacy mainly due to failures within the cold-chains. In 2019, 356,000 deaths were linked to extreme heat. Unchecked warming could result in up to 3 billion people being exposed to mean annual temperatures higher than nearly anywhere today by 2070.

Equally, cooling represents a double burden for the environment with emissions coming from both the electricity and fuel used to operate cooling equipment and the leakage of refrigerant gases. Conventional cooling technologies today already account for more than 7% of all global GHG emissions, contributing to their own demand. Without intervention, these emissions could rise to 90% above 2017 levels by 2050.

While cooling presents a massive environmental challenge, if its delivery is planned carefully it could contribute to three internationally agreed goals simultaneously: Sustainable Development Goals, the Paris Agreement and the Kigali Amendment to the Montreal Protocol. In short, the challenge we face today is how to deliver sustainable, equitable and resilient cooling and cold-chain access for all to help alleviate poverty for millions of people, to provide food security, to ensure universal health and to keep our economies productive without further warming the planet.

At the [Centre for Sustainable Cooling](#) we lead and collaborate across more than \$35 million worth of programs around equitable access to clean cooling, including the new Centre of Excellence in [Africa](#) and India with a series of new programmes in development.

Links to further projects:

[ENOUGH](#)

[TICR](#)



Overview of post

We are seeking to recruit an outstanding academic in emerging market cooling and cold-chain systems to enhance the Centre for Sustainable Cooling capacity and specifically take on day to day leadership of the development of the Centres of Excellence for Sustainable Cooling and Cold-chain in Africa and India.

This is an exciting time to join the Centre for Sustainable Cooling as it continues to build its reputation and secure significant investment from government and industry into its programmes. Our flagship international centre, The Africa Centre of Excellence for Sustainable Cooling and Cold Chain (ACES) was established to lead the way in the development and roll-out of affordable, sustainable, resilient and equitable on- and off-grid cooling and cold-chain solutions for agriculture, dairy, fisheries and health sectors in Africa. The programme is developed by the Governments of Rwanda and the United Kingdom; the United Nations Environment Programme; the UK's Centre for Sustainable Cooling bringing together a consortium of leading UK and international universities, and the University of Rwanda. Funding and support to date exceeds \$25M. Two further Centres are in development in India, in the states of Telangana and Haryana.

ACES is the only Centre of Excellence of its kind with a focus on holistic and sustainable cold-chain solutions tailored for African markets. It has a uniquely situated and equipped 4-hectare headquarters campus in Kigali , under development,

- a state of the art in-market technology test and demonstration centre,
- demonstration and test facilities;
- fully equipped refrigeration and data telemetrics training centres;
- a business hub to support for early-stage technology companies to accelerate to market and scale up their businesses.

A 200 hectare farm to create a unique soil to plate research and development centre, including for energy transition and climate adaptation strategies.

ACES is establishing Specialised Outreach and Knowledge Enterprises (SPOKES) pan-Africa to showcase how solutions can be deployed in practical, real-world applications and provide the on-site and outreach learning, training and knowledge transfer, and technical assistance centres to support local community uptake. The first SPOKE model is being developed in Kenya with African Centre for Technology Studies (ACTS); further SPOKES are being developed. A range of community uptake training and demonstration programmes, and industry capacity building programmes as well as Masters and other academic programmes are being developed at ACES .



You will lead the research and teaching of whole system step-change approaches to sustainable cooling technologies in developing markets. These will include developing equitable, sustainable and resilient cold-chains for food and pharma products within the wider transition to renewables in both low- and middle-income countries, and high-income countries. This necessarily goes beyond simple energy efficiency of existing technologies but needs also to consider, disruptive technologies, energy systems and energy storage; the opportunity offered by modal shifts (e.g., drones) or product reformulations; the underlying business models as well as behavioural changes, policies, and industry operational interventions. Candidates should have an established national and international reputation through significant original research work and a clear record of impact in cooling technology as well as management and growing research.

You will be expected to lead and further grow the Centres' capabilities in cooling technologies, collaborating with colleagues to provide the critical interdisciplinary capability that is needed to address the challenges. This will involve initiating, conducting and publishing international- quality research as well as developing a portfolio of proposals for external funding from UKRI, industry, government and other sources.

The position will be based in the School of Chemical Engineering but you will be expected to travel extensively both to support our international centres and Spokes and also develop further sites. The initial appointment is for two years with the potential to be extended based on performance and grant income.

The post holder will also contribute to the development of the outreach and online training undergraduate and postgraduate teaching in line with the Centre's strategic plans. You will be responsible for the overall administration of the internal programme and Centres ensuring sustained high value research, knowledge transfer, enterprise, business engagement, and public engagement or similar activities. In addition, you will be expected to contribute to academic citizenship, likely to be demonstrated through generous, mutually respectful and supportive working relationships with all staff and students within the Centre's.



Duties and responsibilities:

Research

Pursue sustained research activity through original research and scholarship, including other research-related contributions through conference papers and presentations and/or consultancy projects and advice. Where appropriate for the discipline this may include some but not all of the responsibilities listed below.

- Make a major contribution to the management of research activities
- Lead successful funding bids in collaboration with academia and industry which develop and sustain research in the area of sustainable and resilient cooling and cold-chain.
- Conduct and develop related academic and industrial research
- Publish leading research that results in a sustained, highly respected reputation of international quality in the subject area and/or designing and developing innovative underpinning technologies
- Provide expert advice internally and externally
- Provide leadership of research that contributes to the progression of the discipline (in disciplines where this is possible)
- Referee and peer review articles for peer reviewed academic journals and grant applications by research councils and/or other major funding bodies
- Lead sustained high value impact activity in knowledge transfer and enterprise (including business engagement, public engagement) that is of manifest benefit to the Centre and University and: (a) makes a significant contribution to policy development at national and international level; and/or (b) involves development of industrial links and comparable networks and initiatives
- Project manage research activities, and/or supervising other research staff
- Develop novel methodologies and techniques appropriate to the type of research being pursued
- Supervise and examine PhD students, both within the institution and externally

Management/administration

Chair and/or lead activities in the Centre and School and represent the Centre on committees or working groups. This is likely to include some but not all of the responsibilities listed below:



- Manage and undertake out-reach knowledge transfer activities to cooling and cold-chain actors across the whole cooling and cold-chain spectrum as well as enterprise, business engagement and public engagement activities with sustained high value impact of manifest benefit to the Centre for Sustainable Cooling and its international Centres
- Contribute significantly to the development and running of the Centre, for example, leading activity on research
- Develop and manage staff and resources in support of major research activities
- Make significant contributions to the development of the Centre's research strategy
- Develops and implements a culture (including policies and procedures) that promotes Equality and values diversity and inclusion.
- Contribute to the administration/management of research across the Centre
- Lead/project manage a team to devise and implement a new and/or revised process (e.g. new programme or a recruitment drive)
- Advise on personal development
- Contribute to administrative activities within the Centre and the wider University (e.g. appeals panels, working groups).
- Develop and manage staff and resources in support of major research activities





Centre for Sustainable Cooling

The CSC has identified the crosscutting impacts of cooling and has brought together a wide range of stakeholders to develop sustainable solution for regions significantly affected by the rising heat levels and the impact of global warming.

Building connections between experts from institutions, governments, industry, humanitarians and local communities, the centre is developing projects that are adapted to the changing environments, that benefit the economy, health and living conditions. Communities are trained and upskilled to create cold-chain systems that are future proofed, cost effective, sustainable, resilient and equitable.

The CSC currently co-lead on more than £30 million worth of research programmes across the UK, EU, Africa and Asia. These multi-million-pound projects take a whole system approach to cooling and cold-chain. Working with new technology that is energy efficient, climate friendly, adapts to changes in environment and social behaviour and considers policy, skills, regulations and financial structures.

CSC research is focused on the post-harvest practices, storage and distribution of food and other cold-chain goods such as vaccines.





'ACES is a demonstration of how we can work together, to help tackle rising emissions and keep alive the goal of limiting average global temperature rises. Cooling and refrigeration are the fastest-growing source of greenhouse gas emissions in the world, especially in developing countries. But this challenge gives us the opportunity to develop innovative, energy efficient technologies of the future.'

COP President, the Rt. Hon. Alok Sharma MP



Personal Specification

- A higher degree relevant to the research area (usually PhD) or equivalent qualifications.
- Demonstrated excellence in Research and its Management and Administration.
- Have both extensive theoretical and practical knowledge of cooling systems, their design, commissioning, operation and maintenance. Preference will be given to candidates who:

Research Requirements

- An excellent national reputation and a developing international profile through original research work and a clear record of impact. Evidence of success under the following headings:
- High level peer esteem as evidenced by
- Excellent reputation in the UK and often internationally, reflected in sustained high quality output, level of innovation, impact on subject and recognition.
- An excellent and sustained record of peer reviewed research publications.
- Successful and sustained supervision of doctoral students to completion.
- Substantial and sustained research income generation, e.g. through research grants, contracts, research consultancy or other external funding.
- Sustained high value impact knowledge transfer and enterprise that is of manifest benefit to the Centre and the University
- can demonstrate experience across a range of systems (i.e., industrial, commercial, transport and domestic).
- have, in particular, experience with design, operation and maintenance of off-grid refrigeration/cooling systems.
- Able to understand and analyse relevant technical documents such as electrical schemes, fluid schemes, piping diagrams, psychometric diagrams, etc.
- Experience of modelling of heat transfer, cooling system performance and building simulation performance.
- Ability to lead an international research team and interact with industry to provide high quality, relevant and timely outputs.

Preferable:

- Experience in design, application, and integration of off-grid refrigeration systems.
- Experience of the pharmaceutical cold-chain.



- Experience of engineering software (design – particularly CAD, heat transfer programs, refrigeration design and optimisation programs).
- Preference will be given to candidates who have both academic and industrial experience

Skills:

- Excellent networking, engagement with stakeholders and communication skills (oral, written and presentation).
- Excellent project and time management skills.
- A 'can do' attitude with ability to take on new tasks and drive them to a successful conclusion.
- Ability and desire to travel both within the UK and internationally.

the Department/School/College or University.

- Successful and sustained contribution to the corporate life of the School/College/University, displaying willingness to contribute actively to committees, collaborative teaching and administrative tasks.
- Actively promotes equality and diversity to internal and external stakeholders.
- Able to use data to identify equality and diversity issues.
- Experience of developing interventions to address equality and diversity issues

Management and administration-related requirements

- Demonstrated significant achievement in management and administration-related activities, which may include leadership of activities/initiatives. Evidence of success under the following headings.
- Successful and sustained performance in significant administrative/managerial role (s) (e.g. exams officer).
- Significant and sustained high quality innovative contributions to the management/administration of



How to apply

All correspondence regarding recruitment activity is issued through our online recruitment portal, please ensure you regularly check your spam filters/folders for updates.

All applicants are required to apply for vacancies by completing an application form. A CV may be submitted to supplement the information provided in the application form. Using an application form ensures that all applicants provide the information in the same format, which helps the selection panel easily compare the applications that they receive.

Once you submit your application, you will receive an acknowledgment email. The University aims to update candidates within 4- 6 weeks on the progress of an application. If you have not heard back from us during this time, please assume your application has been unsuccessful.

If you are successful in your application, you will be shortlisted for an assessment/interview and you will be able to see this by logging into your account and reviewing your application status. You will also receive an email advising of the next steps.

[Apply here](#)

For informal inquiries regarding the post please contact:

Professor Toby Peters

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Sehar Amer– Programme and Communications Coordinator

Email: s.amer@bham.ac.uk





Birmingham Energy Institute (BEI)

Birmingham Energy Institute (BEI) is developing and applying the technological innovation, original thinking and new ways of working required to create sustainable energy solutions and support the regional, national and global transition to a zero carbon energy system.

A research focussed institute, driving change in the way we deliver, consume and think about energy. Bringing together interdisciplinary research from across the University of Birmingham and working with government, industry and international partners our research is solving societal issues and addressing challenges relating to energy poverty, the circular economy, transport systems, cooling, hydrogen, energy storage and the decarbonisation of heat.

The global community is consuming more energy than ever. As we run out of time to contain climate change the [BEI](#) is upscaling their innovative technology solutions for applications here in Birmingham and across the globe.

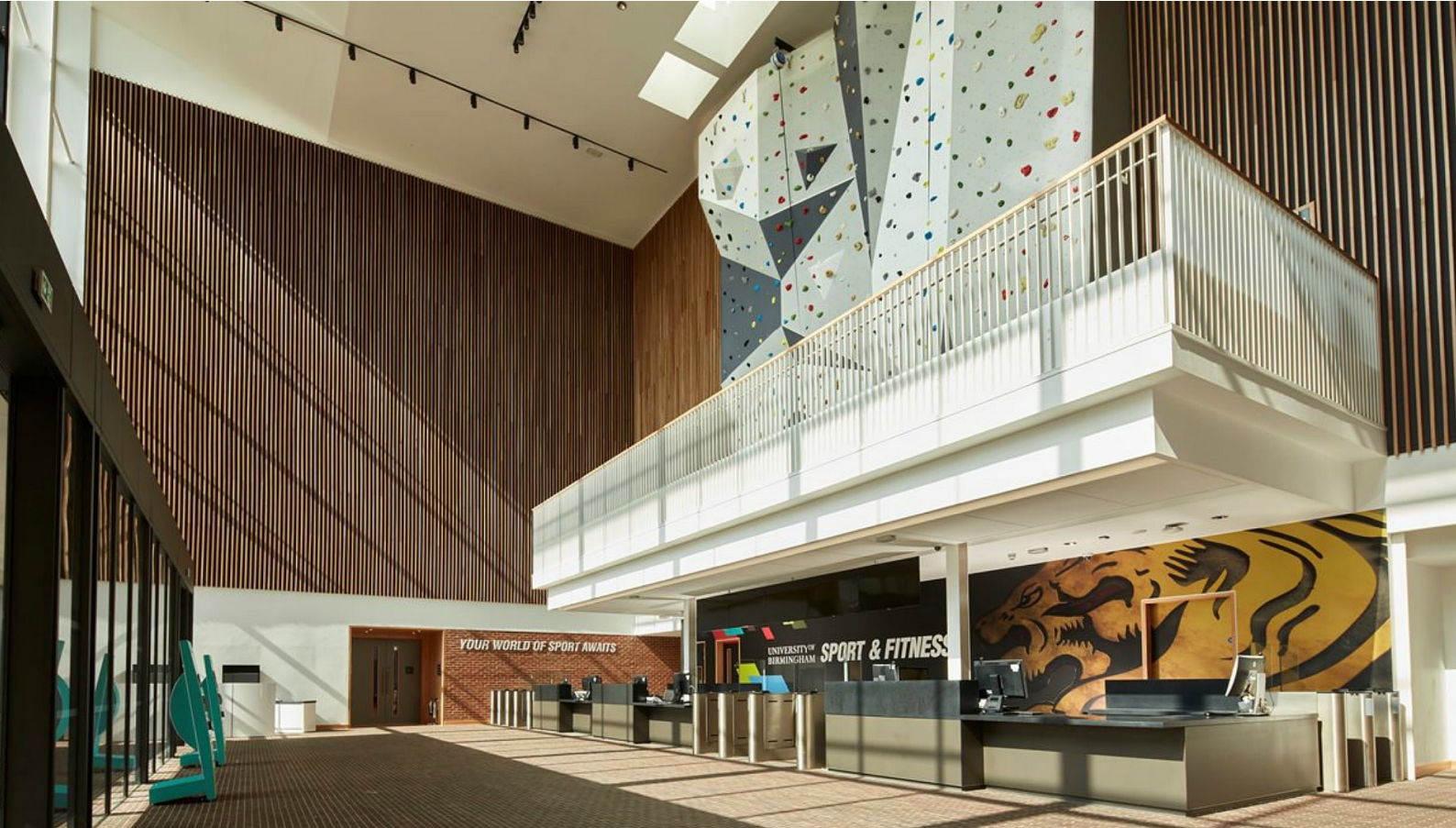




The University of Birmingham

Founded in 1900, the University is part of the prestigious Russell Group. Having 10 Nobel Laureates among staff and alumni, the University of Birmingham has contributed to some of science's greatest discoveries, including in recent times the Higgs Boson and Gravitational Waves. Our research provides innovative solutions to the challenges we face in our city, our region and across the globe. The University has made major investments in academic staffing, investment of £1 billion in campus facilities and annual growth in research performance. The University has a global reputation as a rich and diverse institution known for inspirational thinking, financial stability and strong local, national and international partnerships.





University Benefits

In addition to benefitting from a progressive salary, a generous annual leave allowance and a pension scheme, we hope to provide added extras that help make your time at the University of Birmingham even more enjoyable.

Some of our most popular benefits include travel season tickets, discounted fees at our three Ofsted-registered day nurseries and access to LinkedIn Learning to support your professional development. Alongside our tax-efficient workplace pension schemes and access to free will-writing services, sports clubs and societies as well as staff networks that support equality, diversity and inclusion.

The University supports staff with their health and wellbeing through the Employee Assistance Programme, carefully chosen private dental and medical insurance options and we offer flexible and hybrid working to support you with your work-life balance.

Our staff can access great discounts on computer equipment, grocery shopping, utility bills and much more. Exclusive special offers for University staff including discounts for holidays, gyms and cinemas. As part of our Birmingham in Action initiative we offer all staff one paid day a year to volunteer.





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