

# C-DICE: transforming postdoctoral development to help deliver net zero





We are delighted to introduce the Centre for Postdoctoral Development for Infrastructure, Cities and Energy (C-DICE) that was established in 2021 to transform the development of postdoctoral researchers and accelerate progress towards net zero carbon. The programme is led by Loughborough University, in collaboration with The University of Birmingham and Cranfield University. This document provides further information about what the project is, how to engage, and case studies that demonstrate the impact the project has had so far.



C-DICE's exciting and ambitious agenda includes bespoke opportunities for postdoctoral researchers whilst creating and drawing on a broad community of academics, industry partners and practitioners. In its first year, more than 200 postdocs from 20 universities engaged in these opportunities to grow and deliver impact.

The programme is funded by Research England with matched and in-kind contributions from a growing range of partners, making C-DICE the biggest single investment in postdoctoral researchers in the UK. C-DICE brings together the Energy Research Accelerator (ERA) and the UK Collaboratorium for Research in Infrastructure, Cities and Energy (UKCRIC). In addition, we have partnered with the Faraday Institution, the Alan Turing Institute and the Manufacturing Technology Centre (MTC) to open up development, networking, facilities and funding opportunities even further.

Partnership with industry and policymakers is an essential component of C-DICE. It enables the research community to understand industry and policy priorities on the path to net zero, support collaborations and provide industry with access to highly-sought-after expertise and facilities.

Read on to find out more, and if you haven't done so already, join our mailing list, follow us on Twitter and Linked-In to keep up-to-date with all the opportunities C-DICE has to offer.



*Dr Kathryn North  
Director, C-DICE*



*Professor Sergio Cavalaro  
Principal Investigator,  
Loughborough University*



# C-DICE opportunities

C-DICE offers Opportunities for Postdoctoral Researchers at any of our 18 Partner Universities.

## Be a part of a unique Postdoctoral Network

C-DICE is creating demonstrable benefits for individual postdoc development and for the whole postdoctoral community. Through C-DICE, postdocs can access funding, build new collaborations, acquire skills, share expertise and work with industry and academic partners to contribute towards net zero carbon.

## Fellowships

A C-DICE fellowship is designed to support the transition to fully independent research leader by developing and expanding the Fellows’ research experience and research portfolio. C-DICE Postdoctoral Fellows create their own research project, with a net zero-related aim, and will be fully funded for 1 year full-time, or part-time pro rata. The competitive application process is a development opportunity in itself, and C-DICE also offers postdocs the chance to act as a peer reviewer.

## Secondments and Placements

A placement or secondment is a temporary transfer of a postdoc to another workplace. C-DICE placements are short term (<1 month) which include a stipend for travel and subsistence, while C-DICE secondments are medium term (1-6 months) and provide compensation for salary and include a stipend for travel and subsistence. C-DICE can support finding a partner, advertising an existing project, or supporting an existing partnership to create a placement or secondment. C-DICE has agreed with EPSRC, that a no-cost extension will be approved for standard grants where time is needed to release a postdoc to undertake a secondment.

## Networking Grant

A networking grant enables postdocs to spend time in industry, a NGO, or another university to create networks. The funding covers travel, subsistence and consumables up to a maximum of £1K (or £2K for international travel).

## Training

C-DICE offers a diverse suite of training, flexibly designed to meet the needs of postdocs to build skills and develop careers. Opportunities include technical and professional development, drawn from across the C-DICE partnership, to fit around busy schedules which enables postdocs to expand their skills and expertise and to develop their career.

## Sandpits

C-DICE Sandpits are a unique opportunity to bring postdoc expertise to a real-world problem relating to net zero in infrastructure, cities and energy. The sandpits are expertly facilitated and are designed to develop collaborative skills whilst developing a research proposal – all with the potential to secure up to £30k in grant funding to deliver the project.

## Dragons’ Den

Participating in a C-DICE Dragons’ Den enables entrepreneurial postdocs to learn about business planning as well as pitch business ideas to business experts with hope of securing up to £2K to get their business ideas off the ground.

## Conference

The C-DICE annual conference is a unique opportunity for postdocs and late-stage PhD researchers to hear from expert speakers, gain skills, share issues to accelerate careers and address the net zero challenge.

## Travel Fund

To encourage in-person activity and networking, C-DICE has established a fund to help C-DICE postdocs attend C-DICE events where they may otherwise not have the funds to do so. C-DICE will contribute up to £150 towards the cost of travel and/or an overnight stay.

## Caring Support Fund

C-DICE recognises that caring responsibilities can present a barrier to postdocs attending and participating in C-DICE events and activities. C-DICE has therefore introduced a Caring Support Fund to help meet additional costs.

## Micro-credentials

This is an assessment-based record that demonstrates achieving capability in a certain skill set and/or knowledge base. C-DICE uses Badgr micro-credentials to award postdoctoral researchers for attending and gaining skills in various programmes delivered by C-DICE. These are a great addition to CVs and job applications to provide evidence of skills.

## Tracking your Training and Career Development

C-DICE uses Inkpath as a portal for researchers to register for events and apply for funding and opportunities. Inkpath is designed with researchers in mind, allowing you to track your activities, capture reflections, and create a pathway for your own professional development and plan for your next career steps. [inkpath.co.uk](https://inkpath.co.uk)

# Benefits for universities and academic staff

## Training and Development for your Researchers

C-DICE offers bespoke training and development opportunities for your researchers, which will increase their skills and advance their careers. C-DICE can add value to your projects through your postdocs increasing the impact and visibility on your research.

## Enabling New Collaborations

Many of the opportunities listed on page 4 provide the opportunity for you to expand your network and build contacts in universities and industry via the postdocs on your project. This may help to open doors for you to work with businesses and/or other research groups and bid for funding for collaborative research programmes.

## Commitment to the Researcher Concordat

All of the C-DICE HEI partners have demonstrated a commitment to the *Concordat for the Career Development of Researchers and the HR Excellence in Research*. We can help you to deliver this commitment through engaging with your organisation and providing funding and appropriate and bespoke career development opportunities for researchers.

## C-DICE and Impact

C-DICE celebrates and promotes the impact postdocs make and gathers evidence of the importance of supporting postdocs to the UK’s research and innovation, working with partners to realise new opportunities to enhance the postdoctoral experience.

# Benefits for businesses

C-DICE offers businesses the opportunity to draw upon a wide base of postdoctoral talent that can help your business, develop new products and processes or solve some of the business-critical research challenges that you face.

Through our secondment programme, we offer a range of postdoctoral secondments for business, which can be tailored to your needs. These are available from one week up to six months. We are happy to discuss your specific requirements with you.

The C-DICE sandpit is proving to be a novel and exciting new way of solving problems and developing research ideas and solutions. The C-DICE sandpit creates networks of researchers to solve real-world problems in a unique and interdisciplinary way and could help to find solutions to key challenges facing your business.

# C-DICE partners

CORE	Loughborough University University of Birmingham Cranfield University
ERA	Aston University British Geological Survey Keele University University of Leicester University of Nottingham University of Warwick
UKCRIC	Heriot Watt University Newcastle University University of Bristol University of Cambridge University of Edinburgh University of Leeds University of Manchester University of Sheffield University of Southampton
Industry	ARLI ATETA Birmingham Energy Institute Energy Systems Catapult Des19ncor EDF ENGIE HS2 Mott MacDonald Severn Trent SAO Innovation Trust Pro Tyseley Energy Park
Other	Alan Turing Institute CRAC Vitae Faraday Institution HyDEX Midlands Innovation Prosper TALENT UKRSA



## Dragons' Den Case Study

### Dr Kieran Bjergstrom

Dr Kieran Bjergstrom is the winner of the C-DICE inaugural Dragons' Den competition. Kieran's expertise is in the science and strategy of translating cutting-edge innovations to the blue economy, net zero, and wider policy space, with deep focus on Quantum Technologies and sophisticated AI-driven systems. Kieran applied for the C-DICE Dragons' Den as it was an excellent and timely opportunity to test his business ideas, and their direction of travel, with business experts (the dragons). It was also an opportunity to develop visibility and credibility for his business – a positive – positive!

In addition to a cash prize, by winning the Dragons' Den Kieran has received expert mentorship from one of the dragons who has provided support and shared insights and knowledge that would otherwise have to come from experience over time. The process of participating in the Dragons' Den also has refined his skills of communicating his business more successfully – providing an accelerated learning experience.

If you're thinking of applying for the next C-DICE Dragons' Den, Kieran's advice is to use it as a real opportunity to organise your business ideas in a coherent manner, and to test these ideas, and your presentational skills, on the experts to develop and refine your business idea. Kieran's business is growing and is hopefully looking to expand and recruit within the next year.

Kieran can be contacted directly by email at [Kieran@QuantumTechnologies.co.uk](mailto:Kieran@QuantumTechnologies.co.uk).



## Training Case Study

### Dr Amruta Joshi

Dr Amruta Joshi is a Senior Research Fellow at University of Warwick and working on techno-economic-environmental analysis of low carbon energy technologies through energy systems modelling integrated with life cycle assessment. Amruta delivered an expert workshop for C-DICE as part of the C-DICE programme to help equip postdocs with skills to design and deliver training as well as provide a platform for delivery.

Amruta aspires for a research and teaching career pathway and while she is getting good exposure in research and industrial collaborations, she aimed to expand her experience of designing and delivering teaching and training, especially in the UK. C-DICE supported Amruta with putting together a workshop specifically for postdocs on Energy Systems Modelling. This started with identifying the purpose of the workshop and identifying learning outcomes and creating a session that was interactive and fitted into the online format.

Amruta recommends other postdocs would benefit from creating and delivering a workshop with C-DICE, particularly if their current roles are focussed on research. Even if you are not thinking about teaching in the future, Amruta advises that teaching even improves understanding of your own research because "when we teach, we learn more". Also, she feels this key transferable skill will build confidence for approaching grant proposal writing and interviews.



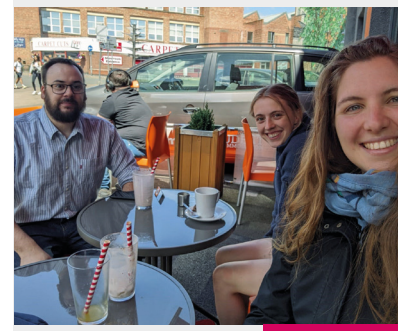
## Fellowship Case Study

### Dr Matthew Deakin

Dr Matthew Deakin is a researcher at Newcastle University. The focus of Matthew's fellowship is to explore whether a new technology called Hybrid Open Point, a device a bit like a supersized mobile phone charger, can unlock energy networks to accommodate increased use of electric vehicles, heat pumps, etc. for low carbon electricity – particularly across urban networks.

Matthew applied for the C-DICE fellowship because at the time, he was looking for ways to develop his own ideas and grow his research independence. The themes of the C-DICE fellowship call were "super relevant" to his work in infrastructure and energy applications in the urban environment. It felt like the right time to be pursuing development opportunities, leading projects, winning funding, towards an academic career. Matthew sees optimising energy networks as key to a net zero, low carbon future.

Matthew recommends that anyone thinking of applying for fellowship should "go for it"! But specifically, to be bold in your project and make it as exciting as possible for a wide range of people. He notes that it's critical that you can explain your research to a diverse set of people who won't be experts in the field and highlight the novelty of your research that no one else is working on. Even if you're not successful the first time, the experience of applying shapes your views and hones your skills for the next time.



## Sandpit Case Study

The first of the C-DICE sandpits explored – *Maximising progress towards net zero in cities and infrastructure industries while promoting convergence to a circular economy* which took place in late 2021. The winning team's proposal set out to investigate the impacts of retrofit at scales: analysing the decisions behind retrofit as the team had strengths in this area. Dr Marianna Couletianos identified that they had found a gap in the modelling, and this formed the direction of their work, and as the project is a scoping exercise, it will support a larger grant proposal in the future.

The team agreed that they were attracted to apply for a C-DICE sandpit as it was a unique opportunity create networks and pursue their own research independence. They also saw an interesting opportunity to collaborate and work outside of their existing projects. Dr Daniel Green found the interdisciplinary aspect of the sandpit particularly attractive, along with the actual practical training to approach writing viable grant proposals. Principle Investigator, Dr Wil Ward said that the sandpit has enabled a valuable insight into the practical aspects of grant management, such as finances, contracts, etc. Interestingly, both sandpit teams identified that the interdisciplinarity of the sandpit gave a valuable insight into how common terms may have different meanings in different sectors.

The C-DICE award has enabled the team to hire a research assistant, Danielle Abbey, which is one of the ways to use the grant funding. Dr Marianna Couletianos said that it had been an interesting experience to be able sit back and focus on the ideas of the project and let someone manage the implementation. Dr Daniel Green said that many of the skills learned on the sandpit were applicable for fellowship, grant and job applications and recommended the sandpit for all aspects of postdoc career development.



## Placement Case Study

### Dr Laiz Souto

One way to grow your network and enhance opportunities is to undertake a placement in industry or another university. Dr Laiz Souto did exactly this on a C-DICE industrial placement with Sygensys on their Electricity Grid Stability Project in Spring 2022. During the project, the causes of wide-area voltage sags and swells on the GB electricity grid were identified over a range of scenarios characterized by different energy technologies deployed in a representative large-scale power distribution network model.

Laiz said that the placement "provided an interesting opportunity to collaborate with industry stakeholders and on a project that was attractively aligned with my own research interests in improving resilience to extreme weather in low-carbon energy systems". Laiz identified that the arrangements were very convenient, and it was great to have a flexible schedule and work remotely.

Andrew Larkins, Sygensys CEO, said "The benefits of the C-DICE placement have come from expanding the range of skills and experience that we could access for this key project. Laiz was quickly able to get up to speed and rapidly access all the relevant tools and datasets. This allowed her to answer key questions by simulation, achieving good correlation with a sample observational dataset. We plan to further develop this research and it may also form the basis of an academic paper, generating publicity for the business". [www.sygensys.com](http://www.sygensys.com)





### Sandpit Case Study

The second of the C-DICE sandpits explored the topic – *Unlocking user power and behaviour to promote and enable systematic transformation towards a net zero future*, which took place in late 2021. The winning team submitted a proposal entitled “UnlockinG the power of housEholds for flExible eNErGy demAnd manaGemEnt” or GREENGAGE. The project explores the extent the nascent Local Carbon Emissions signal motivates users to offer flexibility services necessary for net zero energy systems. A choice experiment explores users’ willingness to change their behaviour to follow this signal, and consider impacts on bills, networks, and total carbon emissions.



The project will complete in 2023 but so far, the team have made considerable progress and a paper is planned from the results of the choice experiment in the first work package. Principle Investigator, Dr Matthew Deakin, said that it was “super-interesting” leading a project and a valuable and useful experience. For example, the administrative tasks enabled him to experience first-hand the internal processes for dealing with setting up a project and organising project finances, it also gave him an opportunity to try out different management techniques he had observed as a postdoc, which included starting the project with weekly meetings.

When asked what the best part was of engaging in a sandpit, Dr Muhammad Saad Rafaq said that it was the opportunity to collaborate, taking part in interdisciplinary research, meeting colleagues in different areas, and getting a deeper understanding of technical terms across disciplines; economics and engineering in this case. They identified that the sandpit provided knowledge and experience to support the creation of a project which would be needed in their future careers. They encourage anyone thinking about taking part in a sandpit to “go for it!”



### Fellowship Case Study

#### Dr Tom Dolan

Dr Tom Dolan is a researcher at University College London and one of our C-DICE Fellows. Tom’s project is an ambitious one – taking a whole systems view of all the factors contributing to the climate emergency and thinking of the most effective and resilient response to the impacts of global warming as well as systemic approaches to the management and mitigation of it. Tom plans for his fellowship research to have an impact at COP28, to ultimately influence mindsets and change approaches to governance as a means of responding to the climate emergency.

Tom applied for the C-DICE fellowship because of the strong connection of his work to the C-DICE theme of infrastructure as well as the link to UKCRIC where Tom was already engaged, plus his own interest in addressing the climate emergency. The opportunity to define the scope of his research and focus purely on his interests was attractive, rather than responding to the requirements of an existing grant. This has given Tom the freedom to take his research in new directions.

Tom recommends a fellowship for those keen to pursue research ambitions and undertake independent work and develop your career. He also recommends that anyone thinking of applying for a fellowship should clearly identify the research you really want to do, and to think about the wider impact of Equity, Diversity, and Inclusion in your research and in your proposal. For Tom, it is also a personal goal to have an impact in addressing the rise in global temperatures - what he sees as the earth’s biggest challenge.



### Training Case Study

#### Dr Tosin Adedipe

Dr Tosin Adedipe is the Project Manager for the HyPER project at Cranfield University and a regular attendee and contributor to C-DICE activities. Tosin has many professional interests and accolades, including being listed as one of the Women’s Engineering Society’s top 50 women in engineering in 2022, and has research interests that centre around hydrogen as a solution to the climate emergency. HyPER (bulk hydrogen production using sorbent enhanced steam reforming and CO2 separation) involves the design, procurement, construction and operation of a demonstration plant.

Tosin has benefitted from both receiving and delivering C-DICE training through the ‘Connecting with Industry’ programme, and also delivering the ‘Career Pathways for Postdocs’ online workshop. Tosin led a session describing her career journey, answering questions from participants and signposting top tips for postdocs exploring project management as a career option.

Tosin describes her interaction with C-DICE as “a real motivator. I wasn’t sure what to expect from ‘Connecting with Industry’, but it was great learning the language of industry, which helped to crystallise my thoughts and actions”. Engagement with C-DICE has widened networks with fellow postdocs and with expert training leads. “C-DICE is the connector” and Tosin would encourage other postdocs, late-stage PhDs and early career researchers to get involved and “accelerate your career development”.

## Equity, diversity and inclusion

A commitment to equity, diversity and inclusion is a central tenet of C-DICE. We are dedicated to providing an inclusive culture that supports under-represented groups to meet their full potential.

C-DICE opportunities are transforming the development of postdoctoral researchers, and it is our intention that our work will contribute to addressing the systemic inequalities that exist for this community. Our EDI commitment is data-driven, for example using benchmarking and carefully monitoring participation. It is evidence-led, learning from, and applying good practice in EDI, and the intention is to develop and share our own good practice to make a valuable contribution to this agenda.







**98%**  
agreed that the  
sandpit provided skills  
needed for creating  
interdisciplinary projects

**650+**  
researchers  
engaged with  
C-DICE

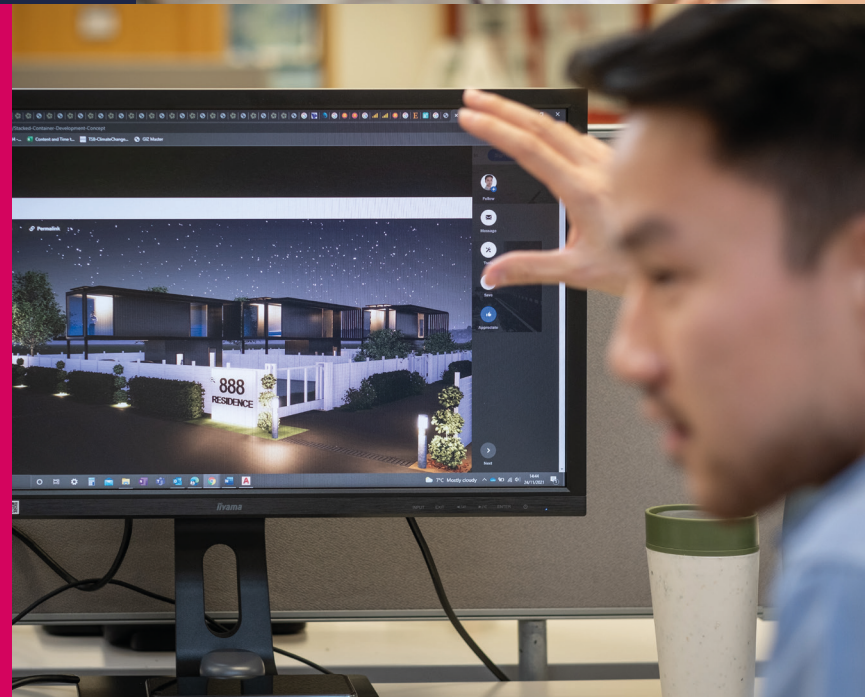


**92%**  
of sandpit  
participants would  
recommend to a  
colleague



**£450k**  
awarded to  
postdocs  
since 2021

**14**  
C-DICE Fellows  
addressing  
net zero issues



**150+**  
training and  
development  
activities delivered





Funded by



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