



## Balancing Supply and Demand: Developing a Net Zero Energy Framework for Difficult-to-Retrofit Buildings in Nottinghamshire

### About the Project

Nottinghamshire County Council (NottsCC) recently launched its 2024 Net Zero Framework, which sets out how the council will become net zero by 2030. One of the key priorities is to reduce its direct emissions by improving the energy efficiency of its buildings. Whilst NottsCC has reduced emissions from its buildings by 59% since 2014-15, energy use still accounts for 31% of its total baseline emissions. Budget cuts and inflation mean that reducing energy use to a minimum is essential not only for reaching net zero but to ensure the future financial sustainability of the council.

A key area of concern for NottsCC is how to improve the energy efficiency and heating controls of some of its poorest-performing building stock. Between the 1950s and 1980s, a consortium of East Midlands local authorities used a construction method called CLASP to build low-cost, lightweight buildings. Whilst revolutionary at the time, they contain Asbestos, which is a serious public health issue. Nottinghamshire has the highest number of CLASP buildings in the UK. They are poorly insulated and expensive to heat, but difficult to modify due to the asbestos. There are too many buildings in use with CLASP Construction for them to be replaced in one go, thus a strategy is needed to identify those which can benefit from energy efficiency performance improvements.

This PhD project aims to develop a framework to improve the energy efficiency of difficult-to-retrofit buildings within Nottinghamshire and raise awareness of NottsCC's Net Zero activities. Different classes of CLASP buildings within the NottsCC portfolio will be reviewed to identify opportunities for energy efficiency interventions. Furthermore, an evidence-based guide on heating control systems for different building types will be developed to inform future heating system upgrades and new builds. The project will work with Inspire to raise awareness about NottsCC's Net Zero work and to identify how local communities can contribute to the Net Zero journey.



## About the Project

This project has been co-created and is supported by researchers from Nottingham Trent University (NTU), the University of Nottingham (UoN) and partners at Nottinghamshire County Council and Inspire. The successful candidate for this project will be enrolled at the University of Nottingham.

## Project Aims

The overall aims of this project are to:

1. Identify the net zero energy potential of different categories of CLASP buildings in Nottinghamshire County Council's building portfolio.
2. Develop heating system audit guides and thermal comfort assessment surveys for a range of difficult-to-upgrade buildings.
3. Raise awareness of NottsCC Net Zero journey with local communities and find ways the public can contribute in this process.

## Supervisory Team

1. Lead Academic Supervisor: [Dr Orla Williams \(UoN\)](#)
2. Academic Co-Supervisor(s): [Dr Kate Simpson \(NTU\)](#), [Prof Richard Bull \(NTU\)](#)
3. Community Supervisor(s): [Phil Berrill \(Nottinghamshire County Council\)](#), [Chris Beattie \(Inspire\)](#)

## Key Details

|                      |  |
|----------------------|--|
| Host University:     | University of Nottingham   |
| School / department: | School of Engineering  |
| Start date:          | 01 April 2025  |
| Financial offer:     | Tuition fees covered in full (worth approx. £15k across full PhD programme). Monthly stipend based on £19,237 per annum, pro rata, tax free. |



## Key Details

|                       |  |
|-----------------------|--|
| <b>Working hours</b>  | Full-time (minimum 37.5 hrs per week)  |
| <b>Working Style:</b> | Primarily in-person at host university. Flexible working supported. Working pattern to be agreed between successful candidate and lead supervisor. |

## Competencies

### Co(I)laboratory Core Competencies

| Category                            | Competency  | Assessed:<br>Application (A),<br>Interview (I) |
|-------------------------------------|---|--|
| <b>Comprehension and evaluation</b> | Strong understanding of the project and its subject matter.   | A / I  |
|                                     | Analytical, researcher mindset with keen attention to detail.   | A / I  |
|                                     | Communicate complex concepts with clarity and precision.  | A / I  |
|                                     | Able to identify connections, patterns, gaps, and irregularities in information/data.                               | I  |
|                                     | Able to interpret data/information confidently with logic and empathy to derive meaning.                            | I  |
| <b>Social and emotional</b>         | Demonstrable experience of responding effectively changing contexts, information and demands.                       | A  |
|                                     | Ability to persevere in the face of challenges/failures and to remain constructive in developing solutions.         | A  |
|                                     | Demonstrable passion for learning with clear drive and curiosity to undertake this specific research project.       | A / I  |
|                                     | Willingness to immerse oneself in the research subject matter and make a contribute to new knowledge through a PhD. | A / I  |
|                                     | Strong desire to make a positive community impact through the research.   | A / I  |
|                                     | Willingness to think deeply about complex concepts and engage with academic ideas and theory.                       | A / I  |



## Competencies

| Co(I)laboratory Core Competencies             |  |  |
|---|--|--|
| Category                                      | Competency   | Assessed:<br>Application (A),<br>Interview (I) |
| <b>Preparedness and potential for success</b> | Experience of working, collaborating and communicating effectively with different stakeholders.                        | A  |
|   | High level of self-motivation and ability to work with minimal guidance.   | A / I  |
|   | Strong organisational and time-management skills with the ability to balance and prioritise multiple tasks.            | A / I  |
|   | Ability to identify potential challenges and complexities and thoughtfully consider possible solutions.                | A / I  |
|   | Able to identify the technical, personal, or professional skills required for a task and take action to develop these. | A / I  |
| <b>Community Context</b>                      | Genuine desire to undertake community-engaged research over more traditional approaches to research.                   | A  |
|   | Understand the impact of and need for the inclusion of diverse experiences and points of view in research.             | A / I  |
|   | Appreciation/understanding of the importance of community insight and experience in the generation of new knowledge.   | A / I  |
|   | Awareness/understanding of the broader societal context related to the subject matter of the project.                  | A / I  |

| Project Specific Competencies  |  |  |  |
|--|--|--|--|
| Essential  | Assessed:<br>Application (A),<br>Interview (I) | Desirable  | Assessed:<br>Application (A),<br>Interview (I) |
| Familiarity with the building and construction industry and/or energy and climate change policy. | A / I  | Professional experience working in building maintenance or building design | A / I  |
| Strong IT proficiency with the ability to learn and use new software and digital tools.          | A / I  | Knowledge of research data collection through observation and interviews.  | A / I  |



## Competencies

| Project Specific Competencies  |  |  |  |
|--|--|--|--|
| Essential  | Assessed:<br>Application (A),<br>Interview (I) | Desirable  | Assessed:<br>Application (A),<br>Interview (I) |
| Appreciation of the ethics of working with or carrying out research with people and communities. | A / I  | Experience in building relationships with key stakeholders such as community organizations, policymakers, or academic partners | A / I  |
| Appreciation for key concepts relevant to the research project.                                  | A / I  |  |  |

## References for Further Reading

- NottsCC, 2024 Nottinghamshire County Council Net Zero Framework. 2024. Available from: <https://www.nottinghamshire.gov.uk/media/0u5a2fhr/netzeroframework.pdf>
- NottsCC, Carbon Reduction Plan for Nottinghamshire County Council 2022-2032. 2022. Available from: <https://www.nottinghamshire.gov.uk/media/5080777/carbonreductionplan20222032.pdf>
- Government, H., The Climate Change Act 2008 (2050 Target Amendment) Order 2019. 2019: UK. Available from: <https://www.legislation.gov.uk/ukdsi/2019/9780111187654>
- Reguis, A., et al., Energy performance of Scottish public buildings and its impact on the ability to use low-temperature heat. *Energy and Buildings*, 2023. 290: p. 113064. Available from: <https://doi.org/10.1016/j.enbuild.2023.113064>
- Ahmed, H., et al., Post Occupancy Evaluation of School Refurbishment Projects: Multiple Case Study in the UK. *Buildings*, 2021. 11(4): p. 169. Available from: <https://doi.org/10.3390/buildings11040169>
- Bull, R., et al., Moving beyond feedback: Energy behaviour and local engagement in the United Kingdom. *Energy Research & Social Science*, 2015. 8: p. 32-40. Available from: <https://doi.org/10.1016/j.erss.2015.04.006>
- Morton, A., et al., Empowering and Engaging European building users for energy efficiency. *Energy Research & Social Science*, 2020. 70: p. 101772. Available from: <https://doi.org/10.1016/j.erss.2020.101772>
- Asojo, A., H. Vo, and S. Bae, The Impact of Design Interventions on Occupant Satisfaction: A Workplace Pre-and Post-Occupancy Evaluation Analysis. *Sustainability*, 2021. 13(24): p. 13571. Available from: <https://doi.org/10.3390/su132413571>
- Neri, G., 14 The jewel of the Triennale: dialogues between Italy and the UK around a school in Post-war Architecture between Italy and the UK, L. Ciccarelli and C. Melhuish, Editors. 2021, UCL Press. p. 213-235. Available from: <https://library.oapen.org/bitstream/handle/20.500.12657/51820/9781800080836.pdf?sequence=1&isAllowed=y>
- Prizeman, O., M. Boughanmi, and C. Pezzica, Carnegie Libraries of Britain: Assets or Liabilities? Managing Altering Agendas of Energy Efficiency for Early 20th Century Heritage. *Public Library Quarterly*, 2022. 41(1): p. 43-82. Available from: <https://doi.org/10.1080/01616846.2020.1826242>

