



School of Computing, Engineering, and the Built Environment Edinburgh Napier University

PHD STUDENT PROJECT

Funding and application details

Funding status: Self funded students only

Application instructions:

Detailed instructions are available at <https://blogs.napier.ac.uk/scebe-research/available-phd-student-projects/>

Prospective candidates are encouraged to contact the Director of Studies (see details below) to discuss the project and their suitability for it.

Project details

Supervisory Team:

- DIRECTOR OF STUDY: Behrang Vand (Email: B.Vand@napier.ac.uk)
- 2ND SUPERVISOR:

Subject Group: Built environment

Research Areas: Architecture, Building & Planning, Engineering, Environmental Sciences

Project Title: Empowering Sustainable Districts: A Blueprint for Low-Carbon Energy Excellence

Project description:

In light of the European Union's stringent energy policies, there is a growing need to not only enhance energy efficiency and ramp up renewable energy usage but also substantially reduce global energy demands for long-term sustainability. Buildings, accounting for nearly one-third of global energy consumption and emissions, emerge as pivotal players in this shift towards sustainability.

Within the United Kingdom, where more than 70% of current buildings will persist into 2050, finding innovative solutions to curb energy consumption and carbon

emissions becomes paramount. This research delves into the plethora of technical solutions available, aiming to tailor approaches based on a city's unique resources and infrastructural capabilities.

This study involves a meticulous analysis of both established and cutting-edge low-carbon energy technologies at the district level. This includes an exploration of photovoltaic systems, solar thermal technologies, small-scale wind turbines, ground/air source heat pumps, micro combined heat and power systems, and energy storage solutions such as hot water storage tanks. The integration of these technologies necessitates sophisticated modeling, simulation, optimization, and analysis at both micro and macro levels within a district.

Through this comprehensive study, the aim is to identify best practices, pinpoint barriers, and curate a repository of solutions tailored to diverse building types and communities. By showcasing successful implementations and providing actionable insights, our research aims to pave the way for a sustainable and energy-efficient future for districts across the UK and beyond.

References:

Candidate characteristics

Education:

A first-class honours degree, or a distinction at master level, or equivalent achievements in Energy or Sustainable Technologies Engineering areas

Subject knowledge:

- Proficiency in foundational engineering concepts and related domains would be highly advantageous for this role.

Essential attributes:

- The ideal candidate should possess a combination of technical expertise, innovative thinking, and strong communication skills.
- Adaptability, problem-solving abilities, and a collaborative mindset are essential attributes.
- A proven track record in project management and a deep understanding of industry trends are also highly valued.