

## Achieving Sustainable Housing Affordably (ASHA)

### PhD 4 Outline

#### How sustainable is sustainable housing?

We are currently seeking applicants for Project 4 of ASHA – How sustainable is sustainable housing?

*Background: The ASHA project*

Affordable housing is crucial to achieving sustainability goals and acts as a fulcrum between the social floor and the ecological ceiling (Raworth, 2017). However, achieving complementarity between housing and sustainability is a serious national and global concern particularly under conditions of climate change. How do we develop and maintain housing stock that is both sustainable and affordable, across new and existing housing, and in the day-to-day use of housing while meeting this global challenge? The Achieving Sustainable Housing Affordably (ASHA) project will answer this question through four PhD topics by pioneering an innovative interdisciplinary approach that develops sustainable design solutions while recognising and responding to questions of power, equity, politics, and agency central to housing. ASHA seeks to achieve sustainable housing without exacerbating inequalities driven by housing affordability pressures. Bringing together social science and applied science approaches, and using skills from engineering, law and geography, ASHA will develop affordable techniques for sustainability in existing and new housing stock, and in housing usage.

#### PhD 4: How sustainable is sustainable housing?

This project will investigate technical and regulatory factors that determine whether a house is sustainable over the long term, assessing the energy efficiency, affordability, durability, and overall environmental impact of housing.

An in-depth analysis of sustainable housing, encompassing energy efficiency, material longevity, water conservation, sustainable energy generation and overall ecological footprint will be conducted to examine the balance between environmental sustainability and social factors such as affordability and accessibility. To bridge the gap between policy and practice the current state and effectiveness of technical standards and regulatory frameworks governing sustainable housing will be assessed to identify and evaluate the gaps between existing regulations and actual sustainable housing practices.

Lifecycle, environmental impact, and performance of materials used in sustainable housing will be investigated and the efficiency and sustainability of resource management, particularly in water use and energy consumption will be analysed.

The impact of sustainable housing on occupant health and well-being, (examining air quality, natural light, and thermal comfort) will be explored along with the societal implications of sustainable housing, including community engagement and social equity.

The aim would be to cocreate actionable recommendations for policy makers, urban planners, and architects to enhance the sustainability of housing and to propose pathways for innovative design solutions that bridge the gap between ideal and practical sustainable housing.

Key research questions include:

What are the key technical elements that define and contribute to the sustainability of housing, and how effective are they in practice?

How do current sustainable housing designs manage resources like water and energy, and what improvements can be made for greater efficiency?

What are the environmental impacts of materials commonly used in sustainable housing throughout their lifecycle, and how can these impacts be minimized?

How do existing regulatory frameworks support sustainable housing, and where do they fall short in addressing current environmental and social challenges?

What policy changes and design innovations are necessary to bridge the gap between current sustainable housing practices and the ideal sustainable living environment?

In what ways does sustainable housing affect the health and well-being of its occupants, and what social benefits and challenges does it present?

How viable are current sustainable housing practices in the long term, especially considering affordability and adaptability to future environmental changes?

The project will contribute significantly to understanding and improving the long-term sustainability of housing, addressing both technical and regulatory aspects, and providing actionable insights for policy and design improvements.

### **Qualifications**

A high 2.1 or 1st class degree at undergraduate level in engineering, geography, sustainability science or an affiliated area is essential; a relevant masters degree is desirable

Knowledge, skills and experience

The successful candidate will have:

- Experience of collecting and analysing qualitative and basic quantitative data
- A background in engineering, geography, sustainability science and affiliated areas at undergraduate and/or Masters level
- Knowledge of the broad parameters of energy efficiency and sustainable energy and their role in buildings
- Experience of conducting empirical research as evidenced through a dissertation or MSc thesis
- Excellent written and oral communication and interpersonal skills
- Ability to work well independently and collectively as part of the ASHA project team

### **Application Procedure**

Applicants should submit in one document: a cover letter setting out your motivation for applying for the role and how your skills meet the requirements set out in this document AND a full Curriculum Vitae to include the names and contact details of 2 referees (including email addresses), by 15/12/23 to:-

Prof Sarah McCormack Email: <mailto:mccorms1@tcd.ie>