



InVEST

Investigation of PV Energy
Optimisation for self-consumption



MTU

Ollscoil Teicneolaíochta na Mumhan
Munster Technological University

PhD Scholarship

The Munster Technological University (MTU) School of Building & Civil Engineering is pleased to offer a PhD scholarship for research in the area of photovoltaic (PV) energy in the residential market. This scholarship is set within the InVEST project which is a collaborative medium-scale project (2023-2026) aiming to identify current self consumption levels of PV generated energy in Irish households, and methods to optimise the use of this energy within these households. The InVEST project proposes to place the principal stakeholder, the house occupier, to the forefront of residential solar PV. For solar PV technology to take off at a significant level, buy in from the principal stakeholder must be achieved. The InVEST project will put the building occupier to the forefront of the research to understand their electricity use patterns, and how they can maximise solar PV electricity use. Technology which can assist consumers in achieving this will be investigated to aid in this optimisation. The gathering of real-world data for a housing dataset of at least 50 houses will provide very important and insightful information to assist in this optimisation. This project has been supported with financial contribution from Sustainable Energy Authority of Ireland under the SEAI Research, Development & Demonstration Funding Programme 2022, Grant number 22/RDD/866.

The PhD scholarship will provide transformative data to industry and homeowners across Ireland, to build an understanding and culture of adopting renewable energy solutions which are beneficial to the end user. The research conducted under this scholarship will provide significant benefits to society, through optimising the use of PV generated energy, while contributing to optimised solutions which reduce Ireland's contribution to global greenhouse gas emissions.

An indicative outline of the work which the successful candidate will undertake as part of his/her/their PhD thesis as part of the InVEST project is as follows:

- 1) State of the art literature review – Key words: Photovoltaic energy; renewable energy; energy optimization; residential energy use; housing archetypes.
- 2) Wide ranging interaction with stakeholders (e.g. householders, industry based project collaborators, SEAI etc.) to inform development of strategies to optimize PV generated energy use in Irish households.
- 3) Development of strategies and plans to develop new methods of optimizing energy use and energy monitoring in households. This work will be informed by analysing energy patterns and load shifting, precedent and practice set within the industry, while integrating multiple solutions to develop optimization methods.
- 4) Production of research papers for peer reviewed journal publication.
- 5) Production of project reports as required.
- 6) Completion of a PhD thesis.

This research position currently available, offers the candidate an opportunity to work within a medium sized Irish research collaboration, and as part of a multidisciplinary research environment within MTU. The PhD candidate will have opportunity for national and international travel to conferences, and national travel for collaborative research with an industry partner. The PhD candidate will be required to play a key role in the planning and execution of visual reports and

presentations to inform SEAI of progress and preliminary findings throughout the project. The PhD candidates will also work closely with colleagues in MTU in the Sustainable Infrastructure Research & Innovation Group within the School of Building & Civil Engineering.

The successful candidate will receive a stipend of €25,000 per annum for a maximum of three years (and prior to the end of 2026) and an annual contribution of €6,000 towards tuition fees. Applicants should hold an Honours Bachelor degree (minimum final grade 2.1 or equivalent) or a Master Degree in Architecture, Engineering or Construction or in a similar cognate discipline. Fluency in English and excellent written and oral presentation skills are required.

Written applications, in English, should include a concise C.V., a one-page letter of motivation describing why you are interested in this position, an English language test certificate, if applicable and contact details for three referees. Along with the application, please include a copy of relevant qualifications such as official university transcripts. Please email applications to Dr. Niamh Power (niamh.power@mtu.ie) by 16.00CET /17.00GMT on 11th January 2024. Shortlisted candidates will be called for interview later in January 2024.