4-year PhD Research Position

Modelling sustainable energy transitions for Ireland: Capturing technological, economic and social realities

Closing Date:	June 17th 2020
Funding body:	MaREI, the SFI Centre for Climate, Energy and Marine
Research location:	Environmental Research Institute, University College Cork, Ireland
Salary:	€18,500 stipend per annum, plus tuition fees & travel/equipment expenses
Duration and Start Date:	4 years; flexible starting date, ideally September 2020
To apply:	Send an email with a one-page cover letter and CV with contact details of two referees to h.daly@ucc.ie with "**MaREI PhD application**" in the subject.
PhD supervisors:	Dr Hannah Daly, University College Cork (UCC) Dr John Curtis, Economic and Social Research Institute (ESRI)

Project background

Would you like to work on a project contributing to the evidence base for Ireland's future decarbonisation pathways? Applications are invited for a PhD position funded by the MaREI Centre for Energy, Climate and Marine, based at the Energy Policy and Modelling Group (EPMG) in University College Cork (UCC), Ireland. The researcher will work jointly between UCC and the Economic and Social Research Institute (ESRI) to deepen the linkages between two key national energy models that support Irish energy policy and to contribute to the academic literature on the economic underpinnings of Energy Systems Optimisation Models (ESOMs).

ESOMs are foundational tools for planning future energy systems. Their bottom-up, engineering formulation allows for developing long-term least-cost decarbonisation pathways, incorporating whole-energy-system interactions and highlighting environmental, societal and macro-economic trade-offs. Scope also exists within these models for factoring in societal norms and behavioural change, an area of focus which is increasingly being recognised as a priority.

This PhD project will review and develop the economic foundations of ESOMs, both in terms of how the models represent broader macro-economic trends and their impact on energy demand, and of how micro-economic behavioural empirical data can feed into analysing long-term decarbonisation pathways, for example through informing how households uptake low-carbon technologies.

The researcher will contribute to the wider literature on modelling long-term sustainable energy systems transitions and apply these insights to help harmonise the modelling process and cross-fertilise insights between two key energy models in Ireland, Irish TIMES (in UCC) and I3E (in the ESRI).

This PhD will be based primarily in the MaREI Energy Policy and Modelling Group, located at the Environmental Research Institute in UCC. The research will be co-facilitated at the ESRI in Dublin, where there would be an opportunity for extended research visits.

Supervisor team

Dr Hannah Daly, a Lecturer in Energy Systems Modelling in University College Cork, has a decade's experience of building and applying energy systems optimisation models (ESOMs) to issues around sustainable energy policy and pathways. She will provide supervision in the use of the Irish TIMES ESOM and the development of other systems models.

Dr John Curtis, an Associate Research Professor in micro-economics at the ESRI, is an applied micro-economist, with a focus on energy and environmental issues. As well as this disciplinary background, he will bring his research expertise is residential energy efficiency to this project.

Candidate profile

- Strong interest in improving the evidence base for energy policy and decarbonisation pathways
- Quantitative, analytical person; good honours degree in engineering, economics or similar, ideally with a focus on energy. A master's degree and/or industry experience in a relevant topic would be an advantage but not a requirement.
- Interest in multi-disciplinary research and an eagerness to gain proficiency in energy engineering, energy systems modelling and micro- and macro-economics.
- Excellent written and spoken English; ideally experience communicating with diverse audiences.
- Applicants whose first language is not English must show **evidence of English proficiency (e.g. IELTS minimum 6.5, individual sections 6.0)**, please check the requirements at: https://www.ucc.ie/en/study/comparison/english/postgraduate/

Research team and location

The successful applicant will be primarily based in UCC's **Environmental Research Institute** (ERI) (eri.ucc.ie), which is an internationally-recognised institute for environmental research dedicated to the understanding and protection of our natural environment and to developing innovative technologies, tools and services to facilitate a transformation to a zero-carbon and resource-efficient society. Overlooking a protected natural reserve and the River Lee, the ERI is a welcoming, diverse and modern workplace. Cork City, located by Ireland's Atlantic coast, has the cosmopolitan culture of a modern European city and the warmth and character Ireland is famous for.

The PhD candidate will join MaREI's **Energy Policy and Modelling Group** (EPMG) based in the ERI, which is an active and dedicated team of researchers who are deeply engaged in energy policy and energy modelling research. The focus of research in EPMG is on integrated energy systems modelling comprising sectoral energy demand and efficiency, integrated electricity, gas and water modelling and full energy systems modelling.

The **Economic and Social Research Institute's** (www.ESRI.ie) mission is to produce high quality research, relevant to Ireland's economic and social development, with the aim of contributing to knowledge and informing policymaking and public debate. It has over 110 staff including economists, sociologists and other social scientists, in addition to support and technical staff. The ESRI has active research teams working on climate, energy and associated behavioural research topics. This PhD position will build on a long history of collaboration between economists at the ESRI and energy engineers at ERI, bringing a multidisciplinary dimension to the research.