

## MSc Postgraduate Research Opportunity

<b>MSc Project Title:</b>	<b>An Exploratory Analysis of New Circular Economy Business Models in the Wood Construction Sector in Ireland: A Stakeholders Network Analysis Approach</b>
<b>Project Duration:</b>	<b>24 months</b>
<b>Organisation:</b>	<b>Atlantic Technological University (ATU)</b>
<b>Location:</b>	<b>ATU Galway City, Dublin Road, Galway</b>
<b>Stipend:</b>	<b>€16,000 per annum</b>
<b>Responsible to:</b>	<b>Project Supervisors: Dr. Amaya Vega &amp; Dr. Gabriela Gliga</b>

**Funding:** The Programme for Integration of Research and Teaching (**PIRATE**) seeks to promote research and cross disciplinary collaborative activities that integrate research and teaching. PIRATE's Fellowship programme will use **HEA Performance Funding** to support this MSc. postgraduate (Level 9) research at the Atlantic Technological University Galway City.

### Description:

The concept of the Circular Economy (CE) has received increasing attention from practitioners, policy makers, and academics in recent years (Korhonen et al., 2018). There are many definitions of the circular economy, but in general it refers to the idea of an economy that replaces the end-of-life concept simultaneously ensuring sustainable economic growth. Ekins et al., (2019) defines the CE as an economy that has low environmental impacts and makes good use of natural resources through high resource efficiency and waste prevention, with minimal end-of-life disposal of materials. While the concept is relatively new, it has evolved from an initial debate on whether it was realistic or not to expect companies to engage in circularity practices, into a more recent discussion about the implications of adopting new CE business models to boost competitiveness and profitability (Lahti et al., 2018). Additionally, the digital transformation of the business world, commonly referred to as Industry 4.0, has also captured the attention of governments and industry stakeholders around the world (Ghobakhloo, 2020). Unsurprisingly, the European Commission's six priorities for 2019-2024 are aligned to support Europe's twin transition towards both sustainability and digitalisation (European Commission, 2019).

The European Union started the transition to a CE back in 2015 with Closing the Loop, its first CE Action Plan. As one of the key pillars of the European Green Deal, one of the European Commission's priorities for the period 2019-2024, a new Circular Economy Action Plan was adopted in March 2020. The publication of the new EU's CE strategy has triggered action from other countries, including Ireland, to develop national policy on this area. According to Eurostat, Ireland was the European country with the second-lowest circular material use rate in 2020 (2% against the EU27 average of 12.8%) (Eurostat, 2021). Driven by EU and international agendas on climate change and waste, the Whole of Government Circular Economy Strategy was published in December 2021 to provide the policy framework for the CE in Ireland (Government of Ireland, 2021). As part of Ireland's CE Strategy, reducing the carbon intensity of the built environment and developing circular design capabilities are key to the future competitiveness of Ireland's CE. In parallel, the Irish government has also launched a new digital strategy, with increased focus on the digital transformation of the wider business ecosystem (Government of Ireland, 2022). These national policy documents mirror the European-level emphasis on the requirement for a twinned environmental and digital transition for a greener, more innovative, and more resilient economy.

There is wide acknowledgement that the construction sector, one of the world's largest waste generators, can have a key role in reducing its negative environmental impact by adopting CE business models

(Núñez-Cacho et al., 2018). Within this sector, timber construction is particularly well-positioned to contribute to the adoption of new CE business models, transforming the traditional linear model to minimise waste and to improve resource efficiency. Due to easier disassembly and greater potential for reuse and recycling, the use of materials such as wood in CE-based construction and buildings can bring significant environmental and economic benefits (Hossain et al., 2020). Within this sector, a circular construction and buildings approach has been defined as “a life-cycle approach that optimizes the buildings’ useful lifetime, integrating the end-of-life phase in the design and using new ownership models where materials are only temporarily stored in the building that acts as a material bank” (Leising et al. 2018, p. 977). A circular building approach should consider the complete life cycle of the building (Pomponi and Moncaster, 2017). Previous research agrees on the need to reassess the conventional end-of-life stage of buildings, often resulting in waste, to favour reduction, reuse, or recycling (Stahel 2016, Geissdoerfer et al. 2017), ensuring that preparations to guarantee that end-of-life dismantling for reuse and recycling are made at the design phase. Similarly, embracing innovative digital construction technologies is fundamental to the future success of the industry. The adoption of Modern Methods of Construction and ‘smart construction’ can significantly increase productivity and efficiencies in the sector (Enterprise Ireland (2021). Furthermore, the digital revolution may offer the much-needed opportunities, solutions and sustainability functions necessary to address the challenges of environmental, economic, and social development (Ghobakhloo, 2020).

However, the twin transition to digitalisation and sustainability is not straightforward. Barriers inherent to the conventional way of organising the construction process have been identified as critical to the advancement of new CE business models in the sector. These include lack of awareness and knowledge of the circular construction processes from a design and a demand perspective, as well as an often-fragmented supply chain, with a lack of consideration and incentives for the adoption of CE business models at both the start and end phase of a building’s lifespan (Adams et al. 2017). Equally, Ireland’s adoption rate of Modern Methods of Construction is low and knowledge and understanding about construction-specific technologies, and how technologies can be implemented lag behind other nations (Enterprise Ireland (2021).

This project presents an exploratory analysis of circularity practices and digitalisation in the wood construction and buildings sector in Ireland. The objective is to identify barriers and opportunities for the development of new digital CE business models in the sector. Specifically, the project will contribute to the identification of the various roles played by the wood construction stakeholders involved in digital CE initiatives in Ireland and internationally. The study will focus on stakeholder networks within the wood construction sector, using Social Network Analysis (SNA) to map the knowledge exchanges between stakeholders aimed at achieving shared objectives on specific activities. The project will contribute to extend the research evidence on digitalisation and CE-based stakeholder involvement in the sector and will provide policy recommendations in line with the EPA Circular Economy Programme 2021-2027, the current EPA research programme, and the Irish Government’s agenda to future proof the construction and buildings sector in terms of innovation, digitalisation, competitiveness and sustainability.

## References

- Adams, K.T., et al., 2017. Circular economy in construction: current awareness, challenges and enablers. *Proceedings of the Institution of Civil Engineers*, 170 (1), 15–24
- Enterprise Ireland (2021). A Detailed Description of Needs for the Irish Construction/Built Environment Sector covering Technology and Innovation, Digital Adoption and Modern Methods of Construction in the Context of Productivity Improvement and Sustainability, Project Ireland 2040.
- Ekins, P. et al. (2019), “The circular economy: What, why, how and where”, Background paper, UCL Institute for Sustainable Resources, University College London, <https://www.oecd.org/cfe/regionaldevelopment/Ekins-2019-Circular-Economy-What-Why-How-Where.pdf>.
- European Commission. 2019, European Union Priorities 2019-2024, available at [https://european-union.europa.eu/priorities-and-actions/eu-priorities\\_en](https://european-union.europa.eu/priorities-and-actions/eu-priorities_en)
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- Geissdoerfer, M., et al., 2017. The circular economy: a new sustainability paradigm? *Journal of Cleaner Production*, 143, 757–768.
- Ghobakhloo, M., 2020. Industry 4.0, digitization, and opportunities for sustainability. *Journal of cleaner production*, 252, p.119869.
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- Government of Ireland. 2022 Harnessing Digital. The Digital Ireland Framework, available at <https://www.gov.ie/en/publication/adf42-harnessing-digital-the-digital-ireland-framework/>

Hossain, M. U., Ng, S. T., Antwi-Afari, P., & Amor, B. (2020). Circular economy and the construction industry: Existing trends, challenges and prospective framework for sustainable construction. *Renewable and Sustainable Energy Reviews*, 130, 109948.

Korhonen, J., Honkasalo, A., Seppälä, J., 2018. Circular economy: the concept and its limitations. *Ecol. Econ.* 143, 37–46. <https://doi.org/10.1016/j.ecolecon.2017.06.041>.

Lahti, T., Wincent, J., Parida, V., 2018. A definition and theoretical review of the circular economy, value creation, and sustainable business models: where are we now and where should research move in the future? *Sustainability* 10 (8), 2799. <https://doi.org/10.3390/su10082799>.

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Núñez-Cacho, P., Górecki, J., Molina, V., & Corpas-Iglesias, F. A. (2018). New measures of circular economy thinking in construction companies. *Journal of EU Research in Business*, 2018, 1-16.

Pomponi, F. and Moncaster, A., 2017. Circular economy for the built environment: a research framework. *Journal of Cleaner Production*, 143, 710–718.

Stahel, W.R., 2016. The circular economy. *Nature*, 531, 435–438.

**Requirements/Qualifications:** The successful candidate will hold an Honours Degree (minimum 2:2, but 2:1 or higher is desirable) in a cognate discipline (business, information technology, computer science, life sciences, health sciences or related discipline). The candidate will be expected to work on their own initiative and be willing to acquire the broader skills necessary for the successful completion of an MSc. project.

**Project Duration:** 24 months

**Conditions:**

- € 16,000 Stipend per annum.
- Postgraduate fees for EU students will be covered by the project\* (see below)
- In addition, any necessary travel and material costs incurred during the project will be covered.
- The student will be based on the ATU Galway City, Dublin Road Campus, Galway.

**Please Note:** Candidates from outside the EU are eligible to apply, but will be expected to provide evidence of sources of additional funds to cover excesses associated with Non-EU fees.

If either English or Irish is not the applicant's first language, evidence of English language proficiency is required for registration. Please refer to web link [English Language Requirements | ATU - Atlantic Technological University \(gmit.ie\)](#) view the minimum English language proficiency standards for entry to ATU

**Project Start Date:** October/November 2022

**Application Closing Date:** 12 noon, Monday 12<sup>th</sup> September 2022

Applicants should submit:

- Curriculum Vitae (to include 2 referees)
- A copy of transcript of results
- A Personal Statement

The Personal Statement should not exceed 1 page and include:

- How you meet the requirements of the position
- Why you would like to pursue this MSc. research programme

**Applications must be submitted to [ResearchOffice.galwaymayo@atu.ie](mailto:ResearchOffice.galwaymayo@atu.ie) e-mail address only. Please ensure all documents are emailed as a single Word or PDF file.**

For further information on the project, please contact: Dr. Amaya Vega ([amaya.vega@atu.ie](mailto:amaya.vega@atu.ie))

*\* In lieu of fees the appointed scholar will undertake two hours of academic development activities per week during the academic year through participation in teaching support, tutorial provision, and/or practical demonstration.*

#### **Data Protection Statement**

ATU takes very seriously its legal obligations as set out in the General Data Protection Regulation 2016/679 (GDPR) and the Irish Data Protection Act 2018 to safeguard and protect your personal information in our possession. The personal information which you disclose to us in this form will only be used to assess your suitability; administer and register you for this scholarship. We will not keep your personal information for any longer than is necessary for those stated purposes. **For more details, please refer to ATU's Student Privacy Statement:** <http://www.gmit.ie/general/student-privacy-statement>