

EXPLORING STAKEHOLDER STRATEGIES FOR CIRCULAR ECONOMY ADOPTION IN THE WELSH CONSTRUCTION INDUSTRY

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The construction industry in Wales faces significant environmental challenges due to its high levels of resource consumption and waste generation. As part of broader sustainability goals, adopting Circular Economy (CE) principles is increasingly promoted to reduce environmental impact and improve resource efficiency. This study aims to explore context-specific strategies for enhancing CE adoption in the Welsh construction sector by engaging key stakeholders, including government representatives, industry professionals, and academics. Using a qualitative research approach, semi-structured interviews were conducted with 16 participants and analysed through thematic analysis. The findings reveal that while several policy-driven and industry-led initiatives are currently in place, such as material reuse practices and waste management regulations, significant barriers remain, including inadequate financial incentives, weak regulatory enforcement, and limited collaboration across sectors. Based on stakeholder insights, key strategies recommended for promoting CE adoption include enhanced financial support, stricter regulatory frameworks, the development of local supply chains, and stronger industry-academia partnerships. These findings provide a roadmap for policymakers and industry leaders aiming to foster a sustainable and circular construction industry in Wales, contributing to national sustainability targets.

Keywords: circular economy; construction industry; stakeholders; sustainability; Wales

INTRODUCTION

The construction industry's transition to a Circular Economy (CE) has gained increasing attention as stakeholders seek to address resource depletion, construction waste, and environmental sustainability (Bello, 2025; Martin *et al.*, 2024). The traditional linear economic model, characterised by extraction, production, consumption, and disposal, has led to significant environmental degradation and inefficiencies in material use, making the construction sector one of the most significant contributors to global waste production (Nie *et al.*, 2024). The CE, in contrast, aims to create a closed-loop system where resources are continually reused, reducing waste and minimising the consumption of finite resources. CE principles that emphasize material reuse, resource efficiency, and waste minimisation have been positioned as a sustainable alternative to conventional construction practices (AlJaber

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et al., 2025). Implementation of CE involves adapting existing processes to prioritise sustainability, through practices such as recycling, refurbishing, and designing for reuse. However, it is not a single, unified concept; its application varies across sectors and stakeholders.

Despite the increasing emphasis on circularity, the adoption and implementation of CE principles remain inconsistent, with challenges related to policy enforcement, financial mechanisms, supply chain integration, and multi-stakeholder engagement (Bello *et al.*, 2024; Ding *et al.*, 2023). While some stakeholders, like policymakers, are focused on establishing broad regulatory frameworks, others, such as contractors or suppliers, are more concerned with operationalising these principles. In Wales, CE adoption is supported by key policy initiatives, including the Well-being of Future Generations (Wales) Act 2015 and the Zero Waste by 2050 Strategy, both of which aim to promote sustainable resource management and waste reduction (Edujee, 2023; Reynolds, 2021). While these policies are foundational, they lack specific, enforceable guidelines for stakeholders at the operational level to effectively implement CE.

While these policies provide a framework for transitioning towards circular construction, their effectiveness depends on how well they are translated into industry-wide practices (Hjaltadóttir and Hild, 2021). Existing research indicates that CE adoption is influenced by various economic, regulatory, and infrastructural factors (Osei-Tutu *et al.*, 2023; Idris and Bello, 2023), and while some industry-led initiatives have emerged (Itanola *et al.*, 2024), challenges persist in the form of weak financial incentives, fragmented supply chains, and a lack of cross-sector collaboration (Meltzer *et al.*, 2024; Giorgi *et al.*, 2022). Additionally, a disconnect between CE research and industry application limits the scalability of circular construction solutions and underscores the need for stronger industry-academia collaboration (Leising *et al.*, 2018).

Given these complexities, understanding the distinct roles of various stakeholders is crucial in shaping CE adoption strategies (Osei-Tutu *et al.*, 2024). Policymakers, construction professionals, and academic researchers contribute to formulating, implementing, and advancing CE principles (Bello, 2025). However, the role each stakeholder group plays vary significantly. Policymakers set regulations and create financial mechanisms, contractors and suppliers focus on operational challenges and feasibility, and academics develop research-driven innovations. CE implementation relies on individual stakeholder efforts and how well these actors collaborate to address existing gaps in policy enforcement, funding mechanisms, and supply chain management (Karaca *et al.*, 2024). While prior research has examined technical innovations and policy frameworks for CE (Charef *et al.*, 2024; Bello *et al.*, 2023), limited studies have focused on stakeholder-driven strategies as enablers of CE implementation, particularly in the context of Wales and the broader UK construction industry.

This study aims to explore existing CE initiatives in the Welsh construction sector and stakeholder-driven strategies to enhance CE implementation. By clearly defining the roles of different stakeholders and understanding how their distinct needs and challenges intersect, the study offers a more targeted approach to understanding CE adoption in this context. This study adopts a qualitative research approach through semi-structured interviews with 16 key stakeholders. This research investigates how existing policies, industry initiatives, and academic contributions shape CE adoption

and identifies practical strategies for improving CE. Focusing on stakeholder-driven insights, this study provides a holistic understanding of how CE principles can be effectively embedded into construction practices, moving beyond theoretical discourse to address real-world implementation challenges and opportunities.

LITERATURE REVIEW

Policy and Regulatory Frameworks for CE Adoption

The Circular Economy (CE) challenges the traditional "take-make-dispose" model with a regenerative approach that promotes sustainability (Sharma *et al.*, 2023). While CE is widely embraced globally for its potential to drive resource efficiency (Mubarik *et al.*, 2024), the literature on policy and regulatory frameworks reveals key gaps. For example, policies like the EU's Circular Economy Action Plan (CEAP) and Japan's initiatives have been successful in addressing waste and resource depletion (Kurniawan *et al.*, 2023), yet the practical application of these policies in the construction sector remains underexplored. The UK's Vision Construction 2025 targets—50% emissions reduction and 33% cost savings—are ambitious, but the barriers to meeting these goals, including regulatory and infrastructural constraints, are often understated (Li *et al.*, 2024). While the ILO and UNEP's Green Jobs Initiative has explored employment impacts (Adam *et al.*, 2017), there is limited research on the real-world job creation effects in the construction industry under CE policies. Additionally, the literature presents conflicting views on regulations—some argue they impose high compliance costs (Iraldo *et al.*, 2011), while others suggest they foster innovation (Bello *et al.*, 2023). The Porter Hypothesis, which claims that strict regulations can drive innovation (Porter and Linde, 1995), is not without contradictions, as it may also create barriers for new firms (Albrizio *et al.*, 2017).

Stakeholder-Driven Strategies for Enhancing CE Implementation

Stakeholder theory posits that stakeholders, both internal (e.g., management, staff) and external (e.g., suppliers, customers, NGOs), have distinct needs and influence organisational systems (Schaltegger *et al.*, 2012). While the literature emphasizes the importance of aligning stakeholder interests for long-term value creation (Chang *et al.*, 2017), this focus often overlooks the practical challenges of stakeholder coordination in CE implementation. Bertassini *et al.* (2021) classify stakeholders into internal, value chain, and value network categories, but the literature lacks a deeper exploration of how these roles intersect or conflict in real-world applications, especially in sectors resistant to sustainability practices.

While stakeholder engagement is frequently cited as a key factor in successful CE implementation (Bertassini *et al.*, 2021; Berardi and de Brito, 2021), there is limited discussion on how to overcome organisational barriers like lack of leadership commitment, limited expertise, and siloed departments (Hofmann and Jaeger-Erben, 2020). These challenges are acknowledged, but few studies provide actionable strategies for overcoming them. Additionally, the supply chain barriers identified, such as poor coordination and knowledge gaps (Jaeger and Upadhyay, 2020), are rarely linked to broader industry trends, such as market resistance to recycled materials or fluctuating consumer interest in sustainable products. Furthermore, consumer behavior is largely underrepresented in the literature, particularly how low recycling rates impact CE adoption. While stakeholder engagement is critical, further research is needed on how to foster deeper collaboration among stakeholders across

organisations and supply chains, addressing both the organisational and cultural barriers hindering CE.

METHOD

This study employs qualitative research to explore stakeholder-driven strategies for CE adoption in the Welsh construction industry. Due to the study's focus on diverse stakeholder perspectives across policy, industry, and academia. Qualitative research was deemed appropriate to capture the depth and complexity of these insights (Creswell and Poth, 2018). Semi-structured interviews were used to allow flexibility while ensuring consistency across two thematic areas: (i) current CE initiatives in Welsh construction, and (ii) strategies for enhancing CE implementation. Purposive sampling was adopted to select participants with relevant expertise and involvement in CE policymaking, construction practices, and academic research (Patton, 2015). This ensured that each interviewee provided meaningful, experience-based insights. Three key stakeholder groups were targeted:

- i. Government policymakers and regulators responsible for CE policy
- ii. Industry professionals—contractors, developers, suppliers, and consultants
- iii. Academics and researchers working on CE-related innovations

Sixteen stakeholders participated: five from government, six from industry, and five from academia. All had a minimum of five years of CE-related experience. Sampling continued until thematic saturation was reached, ensuring the comprehensiveness of the data collected (Guest *et al.*, 2006). Interviews were conducted in-person or online, lasting 15-30 minutes. All sessions were audio-recorded with consent and transcribed verbatim. Thematic analysis was conducted manually following Braun and Clarke (2006) six-phase framework. This method allowed the researcher to deeply engage with the data and uncover nuanced patterns in stakeholder narratives. Unlike automated software tools, manual analysis supported iterative theme refinement and better captured the interactions across policy, industry, and academia (Nowell *et al.*, 2017). This approach enabled a rich understanding of the challenges and opportunities surrounding stakeholder engagement in circular construction practices.

DISCUSSION OF RESULTS

Demographics of the Participants

A total of sixteen purposively selected participants participated in this study, representing government (n=5), industry (n=6), and academia (n=5). This distribution ensured a balanced representation of key stakeholder groups relevant to CE adoption in the Welsh construction sector. All participants held academic qualifications (Bachelor to Doctorate) appropriate to their roles. Years of experience ranged from six to twenty years above, with the majority exceeding a decade of involvement in CE-related work. This combination of academic standing and professional experience gave the study a robust foundation for capturing informed, practice-oriented perspectives. The diversity and depth of expertise across the sample strengthened the validity of the findings and enabled a nuanced understanding of stakeholder-led strategies for CE implementation.

Stakeholder-Driven Strategies to Enhance CE Adoption in Construction Sector

This study confirms that key policy frameworks, such as the Well-Being of Future Generations (Wales) Act 2015 and the Zero Waste by 2050 Strategy, are central to the

promotion of Circular Economy practices in Wales' construction sector. However, the study reveals that these policies lack mandatory enforcement mechanisms, which significantly limits their effectiveness. As P5 pointed out, "We have policies, but enforcement is the issue—there are no consequences for non-compliance". This finding aligns with the work of Kirchherr *et al.* (2018) and Pomponi and Moncaster (2017), who argue that policies that rely on voluntary compliance are insufficient for achieving systemic change. Unlike countries such as Finland and the Netherlands, where CE regulations are legally binding, Wales' reliance on soft policy measures creates inconsistencies in implementation across different local authorities. As P12 noted, "Some authorities support CE, others don't—it is inconsistent". This fragmentation in policy application underlines the need for stronger regulatory frameworks to ensure uniformity and accountability in CE adoption.

Financial barriers are another major challenge identified in this study. Participants expressed frustration over the lack of financial incentives to support CE adoption, particularly for Small and Medium-sized Enterprises (SMEs), which dominate the Welsh construction industry. P3 emphasized that "SMEs do not have the financial flexibility to experiment with material reuse", highlighting the economic divide between large firms, which may have access to financial resources, and smaller firms that struggle to adopt circular practices. While financial grants exist to support CE, P10 noted, "If there were financial benefits linked to CE targets, companies would not hesitate to invest", pointing to the inefficiency of current incentives. The disparity between the high cost of recycled materials and the lower cost of virgin materials exacerbates the situation. As P6 noted, "Recycled materials are often priced higher than new ones". This reflects a broader market inefficiency, aligning with Akinade *et al.* (2017), who argue that the high cost of recycled materials remains a major barrier to CE adoption. The lack of standardised pricing and quality assurance in recycled materials further undermines their competitiveness, leaving many construction firms reluctant to switch to circular practices.

While financial incentives are crucial, the findings also highlight significant barriers related to industry-academia collaboration. Despite extensive research on sustainable materials and circular construction methods conducted by Welsh universities, stakeholders expressed frustration over the slow adoption of this research in industry practice. P1 stated, "We have conducted studies on material reuse and lifecycle design, but the construction sector is slow to adopt these insights". This underscores a disconnect between academic research and industry needs. This gap in knowledge transfer mirrors the findings of Giorgi *et al.* (2022) and Leising *et al.* (2018), who suggest that academia fails to address the practical challenges faced by the construction sector in adopting sustainable practices. Participants such as P9 emphasized that "we need practical, hands-on training programs, not just theoretical reports that sit on a shelf". This highlights the need for applied research that directly engages with the realities of construction practices, suggesting that government-supported initiatives could play a crucial role in facilitating this bridge between research and practice. P1 proposed, "The government should fund applied research projects where universities work directly with contractors and developers to test circular solutions". This calls for a more integrated approach, where industry-driven research is used to directly address barriers to CE adoption.

Cultural resistance within the construction industry emerged as another key theme. The sector's focus on short-term financial savings, speed, and traditional practices often conflicts with the long-term investment required for CE. As P7 noted, "The

financial burden often outweighs the long-term benefits”. This view highlights the deep-rooted issue in the construction sector, where economic considerations often override sustainability goals. In a context where profitability and fast project turnover are prioritised, the reluctance to invest in long-term sustainability measures remains a significant cultural barrier to CE adoption. Akinade *et al.* (2017) argue that SMEs face this dilemma, with limited capacity to absorb the upfront costs associated with circular construction technologies. The study thus identifies a need for greater cultural alignment within the industry, where the focus shifts from immediate cost-saving to long-term value creation through CE adoption.

The findings also highlight organisational barriers to CE adoption, particularly in how companies are structured. Many construction firms operate in silos, with sustainability teams often isolated from other departments, as noted by Hofmann and Jaeger-Erben (2020). This siloed structure leads to lack of coordination between different departments, such as procurement, operations, and sustainability teams, making it difficult to implement CE practices at scale. P6 observed, “We need clearer distinctions—current regulations discourage reuse”, referring to the lack of clear regulatory frameworks for distinguishing recyclable materials from waste. The fragmentation in regulatory frameworks across local authorities further exacerbates this issue. A more coordinated, holistic approach to policy enforcement, as proposed by stakeholders like P8, “Integrating CE into planning approvals to ensure early consideration of material reuse and waste reduction”, is needed to streamline adoption.

While stakeholder engagement is critical for CE adoption, the findings reveal that voluntary compliance, lack of financial incentives, and fragmented regulatory enforcement remain significant barriers. The disconnect between academia and industry, cultural resistance, and organisational silos further hinder the widespread adoption of CE. To address these challenges, this study suggests that stronger regulatory frameworks, financial incentives linked to performance, and enhanced collaboration between industry and academia are essential for creating a more conducive environment for CE adoption in Wales’s construction sector.

CONCLUSION

This study examined stakeholder-driven strategies for CE adoption in Wales’s construction industry. While policies like the Well-being of Future Generations (Wales) Act 2015 and the Zero Waste by 2050 Strategy demonstrate Wales’s commitment to sustainability, their implementation faces challenges due to voluntary compliance, inconsistent enforcement, financial limitations, and infrastructure gaps. A key contribution of this research is its focus on financial incentives—such as targeted grants, tax reliefs, and performance-based funding—as essential drivers for industry engagement. However, these incentives remain limited and are often insufficient to encourage full industry-wide adoption. The study advocates for regulatory reform, including mandatory CE reporting and more explicit waste classification frameworks. While regulatory measures are essential, their effectiveness is hindered by insufficient enforcement mechanisms and a lack of standardisation across the industry. Barriers like limited access to certified secondary materials and underdeveloped recycling infrastructure hinder CE practices. The study also highlights the need to bridge the gap between academic research and industry practice through government-supported collaborations, CPD programs, and structured

knowledge-sharing. Future research should explore the role of digital technologies in enhancing circularity and extend this work to cross-national comparisons.

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